

## Appendix: Data sources & methodology

### *The cost of mental illness: Alaska facts and figures*

#### Prevalence of mental illness – United States 2017

This chart presents the past-year prevalence of serious psychological distress and several mental health conditions in the U.S. population, as determined by a variety of nationally-representative surveys. Prevalence statistics are retrieved from <https://www.nimh.nih.gov/health/statistics/index.shtml>, except for serious psychological distress and major depressive disorder. The original sources are listed below.

- **Serious psychological distress:** in adults during past 12 months. From National Survey on Drug Use and Health, (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 6/17/19). Variable: spdyr = 1 (adults only) Past year serious psychological distress indicator, recoded from K6SCMAX $\geq$ 13 (based on past month and worst month in past year K6 score). Weight applied: DASWT\_1: Combined 2016-2017 Das Analysis weight.
- **Bipolar Disorder:** 12-month prevalence of 2.8% of U.S. adult population. Harvard Medical School, 2007. National Comorbidity Survey (NSC). (2017, August 21). Retrieved from <https://www.hcp.med.harvard.edu/ncs/index.php> Data Table 2: 12-month prevalence DSM-IV/WMH-CIDI disorders by sex and cohort [https://www.hcp.med.harvard.edu/ncs/ftpdire/table\\_ncsr\\_12monthprevgenderxage.pdf](https://www.hcp.med.harvard.edu/ncs/ftpdire/table_ncsr_12monthprevgenderxage.pdf) (links active as of 03/21/18)
- **Major Depressive Disorder:** 12-month prevalence of 6.0% of U.S. adults aged >18yrs. From: Past Year Mental Disorders among Adults in the United States: Results from the 2008-2012 Mental Health Surveillance Study, available at: <http://www.samhsa.gov/data/sites/default/files/NSDUH-DR-N2MentalDis-2014-1/Web/NSDUH-DR-N2MentalDis-2014.htm> (link active as of 12/9/16)
- **Schizophrenia:** 12-month prevalence of 0.3% of U.S. adult population. Original sources: McGrath J, Saha S, Chant D, Welham J. Schizophrenia: a concise overview of incidence, prevalence, and mortality. *Epidemiol Rev.* 2008;30:67-76. PMID: 18480098 <https://academic.oup.com/epirev/article/30/1/67/621138>, and Kessler RC, Birnbaum H, Demler O, Falloon IR, Gagnon E, Guyer M, Howes MJ, Kendler KS, Shi L, Walters E, Wu EQ. The prevalence and correlates of nonaffective psychosis in the National Comorbidity Survey Replication (NCS-R). *Biol Psychiatry.* 2005 Oct 15;58(8):668-76. PMID: 16023620 <https://www.sciencedirect.com/science/article/pii/S0006322305004956?via%3Dihub> (links active as of 03/21/18)
- **Post-Traumatic Stress Disorder:** 12-month prevalence of 3.6% of U.S. adult population. See bipolar disorder section above for original source.
- **Generalized Anxiety Disorder:** 12-month prevalence of 2.7% of U.S. adult population. See bipolar disorder section above for original source.
- **Panic Disorder:** 12-month prevalence of 2.7% of U.S. adult population. See bipolar disorder section above for original source.
- **Obsessive Compulsive Disorder:** 12-month prevalence of 1.2% of U.S. adult population. See bipolar disorder section above for original source.

## State variation in prevalence of serious psychological distress – Alaska and United States 2017

This chart presents the past-year prevalence of serious psychological distress in U.S. states.

From National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> link active as of 06/17/19). Variables: state, and spdyr = 1 (adults only) Past year serious psychological distress indicator, recoded from K6SCMAX>=13 (based on past month and worst month in past year K6 score). Weight applied: DASWT\_1: Combined 2016-2017 Das Analysis weight.

## Estimated number of people living with mental illness – Alaska 2017

The estimated number of people in the state are provided based on past-year prevalence percentages from the previous chart. Since some people receive multiple diagnoses of a serious mental illness, they could be represented multiple times in this chart.

Serious psychological distress during the past year is derived from National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> link active as of 03/19/19). Variables: state, and spdyr = 1 (adults only) Past year serious psychological distress indicator, recoded from K6SCMAX>=13 (based on past month and worst month in past year K6 score). Weight applied: DASWT\_1: Combined 2016-2017 Das Analysis weight.

To estimate the prevalence of schizophrenia, bipolar disorder and major depressive disorder, we are applying percentages from [Prevalence of Mental Illness – United States](#) section, to [Census Bureau statistics](#) from 2017 (Adult Population in Alaska, Comparative Demographics Estimates, American Community Survey 1-Year Estimates: 554,614 (link active as of 07/25/19)).

	100%	554,614
SPD	11.7%	64,890
MDD	6.0%	33,277
BD	2.8%	15,529
Schizophrenia	0.3%	1,664

## Unmet need of mental health treatment – Alaska and United States 2017

This chart shows the percentage of adults who indicated an unmet need of mental health treatment.

National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 03/19/19). Variables:

- Row: State
- Column: AMHTXND2, perceived need, but did not receive mental health treatment in past year
- Control: spdyr, past year serious psychological distress
- Weight applied: DASWT\_1
- Used weighted counts to determine the percentages

## Unmet need of mental health treatment due to costs –Alaska and United States 2017

This chart shows the percentage of adults who indicated they could not afford mental health care despite an indication of need.

National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 03/19/19). Variables:

- Row: State
- Column: MHCOST2=1, no mental health treatment in past year because could not afford cost
- Control: spdyr=1, past year serious psychological distress
- Weight applied: DASWT\_1
- Used weighted counts to determine the percentages

A respondent must have reported not receiving mental health treatment that was needed in the past year (AMHTXND2=1) in order to be asked the questions on the reason for not receiving treatment (i.e. costs).

### Unmet need of mental health treatment because of costs differs by insurance coverage – United States 2017

Similar to the last chart, this chart also shows the number of people who did not receive mental health care because of costs in the past year, but in this case, the outcomes are determined for each type of insurance coverage, and on the national level only. State statistics could not be determined for this measure because of a maximum specification of three variables in the NSDUH R-DAS system.

National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 03/19/19). Variables:

- spdyr=1, past year serious psychological distress
- MHCOST2=1, no mental health treatment in past year because could not afford cost. A respondent must have reported not receiving mental health treatment that was needed in the past year (AMHTXND2=1) in order to be asked the questions on the reason for not receiving treatment.
- Covered by private insurance (irprvhl=1)
- Covered by Medicare (irmedicr=1)
- Covered by Medicaid/CHIPCOV (irmcdchp=1)
- Covered by Tricare, Champus, ChampVA, VA, or Military health (irchmpus=1)
- Not covered by any health insurance (IRINSUR4=2)
- Missing data values for MHCOST2 are included in total percentages
- Weight applied: Weight applied: DASWT\_1

### There is significant unmet need for mental health care in Alaska – Alaska 2016

This chart shows, among people who experienced serious psychological distress (which equals 11.7% of the Alaska adult population), the percentage of people who did not receive mental health care despite an indication of need. Among the latter group, we determined the percentage of people who did not receive mental health care because of costs.

National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 03/19/19). Variables:

- 1<sup>st</sup> step:
  - Row: State

- Column: AMHTXND2=1, perceived need, but did not receive mental health treatment in past year
- Control: spdyr=1, past year serious psychological distress
- 2<sup>nd</sup> step:
  - Row: State
  - Column: MHR COST2=1, no mental health treatment in past year because could not afford cost
  - Control: spdyr=1, past year serious psychological distress
- Weight applied: DASWT\_1
- Used weighted counts to determine the percentages

A respondent must have reported not receiving mental health treatment that was needed in the past year (AMHTXND2=1) in order to be asked the questions on the reason for not receiving treatment.

### People with mental illness have greater reliance on the safety net – Alaska 2017

This chart shows the percentage of adults in each insurance category who experienced serious psychological distress in the past year.

National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 07/25/19). Variables:

- Row: State (filter for specific state, otherwise cell size is too small to display results for some state x insurance categories)
- Column: spdyr=1 – past year serious psychological distress
- Control:
  - Covered by private insurance (irprvht=1)
  - Covered by Medicare (irmedicr=1)
  - Covered by Medicaid/CHIPCOV (irmcdchp=1)
  - Covered by Tricare, Champus, ChampVA, VA, or Military health (irchmpus=1)
  - Not covered by any health insurance (IRINSUR4=2)
- Weight applied: DASWT\_1
- Missing data values for AMHTXND2 and MHR COST2 are not included in total percentages
- Used weighted counts to determine the percentages

### Hospitalizations for mental illness – United States 2016

Data are provided on the total number of hospitalization discharges, as well as the rate of hospitalizations per 100 patients (18 years and over), for hospital stays with a primary diagnosis code of schizophrenia, bipolar disorder, or major depressive disorder. Because of the presence of only one primary diagnosis code per hospital stay, the categories are mutually exclusive, despite a high degree of symptom overlap for these three diagnoses.

National data from 2016, retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). We tabulated the total number of discharges for each mental illness (principal diagnosis) in 2016, by age.

- Bipolar Disorder: ICD-10-CM principal diagnosis codes F30.10-31.9, F33.8, F34.81-F34.9, F39
- Major Depressive Disorder: ICD-10-CM principal diagnosis codes F32.0-F32.5, F33.0-F33.42, F33.9

- Schizophrenia: ICD-10-CM principal diagnosis codes F20.0-F20.9, F25.0-F25.9
- SMI total: combined number of hospital days for schizophrenia, major depressive disorder, and bipolar disorder

The hospitalization rate per SMI patient is calculated by dividing the total number of discharges by the estimated number of adults (18+) in the U.S. with SMI in 2016. The latter number is calculated by applying percentages from [Prevalence of Mental Illness – United States](#) to the number of adults in the U.S. in 2016, retrieved from the [Census Bureau statistics](#) (link active as of 07/25/19).

U.S. adult population (18 years and over), Comparative Demographic Estimates, 2016 American Community Survey 1-Year Estimates: 249,489,772

- 748,469 adults with schizophrenia (0.3%)
- 6,985,714 adults with bipolar disorder (2.8%)
- 14,969,386 adults with major depressive disorder (6.0%)

The percentage of hospitalizations of adults because of SMI in the U.S. in 2016 is calculated by dividing the total number of SMI hospitalizations of adults (schizophrenia + MDD + BD) by the total number of hospitalizations of adults (30,188,612).

### Length of stay for mental illness hospitalizations in the U.S. – United States 2016

Data are provided on the average duration, as well as the total number of days for hospital stays for adults with a primary diagnosis code of schizophrenia, bipolar disorder, or major depressive disorder. Additionally, the average duration per hospital stay for all hospitalizations (which includes schizophrenia/bipolar disorder/major depressive disorder) is presented. Because of the presence of only one primary diagnosis code per hospital stay, the categories are mutually exclusive, despite a high degree of symptom overlap for these three diagnoses.

National data from 2016, retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). We tabulated the LOS (length of stay) in days (mean) for each mental illness with ICD-10 codes below (principal diagnosis), and for all hospital stays in 2016. Total days in hospital are calculated by multiplying the average LOS with the number of discharges.

- Bipolar Disorder: ICD-10-CM principal diagnosis codes F30.10-31.9, F33.8, F34.81-F34.9, F39
- Major Depressive Disorder: ICD-10-CM principal diagnosis codes F32.0-F32.5, F33.0-F33.42, F33.9
- Schizophrenia: ICD-10-CM principal diagnosis codes F20.0-F20.9, F25.0-F25.9
- SMI total: combined number of hospital days for schizophrenia, major depressive disorder, and bipolar disorder

### Hospitalizations of elderly patients with serious mental illness – United States 2016

Data are provided on the average duration of hospital stays for adults aged 65+ and 18-64 yr with a primary diagnosis code of schizophrenia, bipolar disorder, or major depressive disorder. Because of the presence of only one primary diagnosis code per hospital stay, the categories are mutually exclusive, despite a high degree of symptom overlap for these three diagnoses.

National data from 2016, retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). We tabulated the LOS (length of stay) in days (mean) for each mental illness with ICD-10

codes below (principal diagnosis) in 2016, by age. The total number of days for each age group was divided by the total number of hospitalizations to calculate the average length of stay.

- Bipolar Disorder: ICD-10-CM principal diagnosis codes F30.10-31.9, F33.8, F34.81-F34.9, F39
- Major Depressive Disorder: ICD-10-CM principal diagnosis codes F32.0-F32.5, F33.0-F33.42, F33.9
- Schizophrenia: ICD-10-CM principal diagnosis codes F20.0-F20.9, F25.0-F25.9

### Trends in length of stay for schizophrenia hospitalizations– United States 2000-2016

Here we provide the trend in average hospital stay duration from 2000 until 2016 of hospital stays with schizophrenia as primary diagnosis, compared to hospital stays with three other, non-mental health care related hospital stays.

National data from 2000 to 2016, retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). Percentages are a direct comparison between values for 2000 and 2016.

- Schizophrenia: ICD-10-CM principal diagnosis codes 295.00-295.95 (ICD9), F20.0-F20.9, F25.0-F25.9 (ICD10)
- Heart Attack (Acute Myocardial Infarction): principal diagnosis codes 401 (ICD9), I21, I22 (ICD10)
- Total hip replacement: principal procedure codes 81.51 (ICD9), OSR9, OSRB (ICD10)
- Kidney Transplant: principal procedure codes 55.61-55.69 (ICD9), OTY (ICD10)
- ICD9 to ICD10 conversion is approximate

### Average hospital costs for mental illness hospitalizations – United States 2016

This chart shows the average hospital costs per stay for hospitalizations with primary diagnosis code for schizophrenia, bipolar disorder, or major depressive disorder.

National data from 2016, retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). We tabulated the number of discharges, and average costs, for each mental illness below (principal diagnosis).

Costs were converted from 2016 to 2018 U.S. dollar amounts with conversion factor 1.03417 (<http://www.calculator.net/inflation-calculator.html>).

- Bipolar Disorder: ICD-10-CM principal diagnosis codes F30.10-31.9, F33.8, F34.81-F34.9, F39
- Major Depressive Disorder: ICD-10-CM principal diagnosis codes F32.0-F32.5, F33.0-F33.42, F33.9
- Schizophrenia: ICD-10-CM principal diagnosis codes F20.0-F20.9, F25.0-F25.9

### Total hospital costs for mental illness hospitalizations in the U.S. – United States 2016

The data presented in this chart shows the total hospital costs for 2016 discharges with primary diagnosis code for schizophrenia, bipolar disorder, or major depressive disorder.

National data from 2016 were retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). We tabulated the number of discharges, and average costs, for each mental illness

below (principal diagnosis). Total hospital costs for each mental illness are calculated by multiplying the mean costs with the number of discharges.

Costs were converted from 2016 to 2018 U.S. dollar amounts with conversion factor 1.03417 (<http://www.calculator.net/inflation-calculator.html>).

- Bipolar Disorder: ICD-10-CM principal diagnosis codes F30.10-31.9, F33.8, F34.81-F34.9, F39
- Major Depressive Disorder: ICD-10-CM principal diagnosis codes F32.0-F32.5, F33.0-F33.42, F33.9
- Schizophrenia: ICD-10-CM principal diagnosis codes F20.0-F20.9, F25.0-F25.9
- SMI total: combined costs for schizophrenia, major depressive disorder, and bipolar disorder

### Total hospital costs for mental illness hospitalizations by insurance type – United States 2016

The data presented in this chart shows the total hospital costs for 2016 discharges with primary diagnosis code for schizophrenia, bipolar disorder, or major depressive disorder by insurance type

National statistics from 2016 were retrieved from HCUPnet. <http://hcupnet.ahrq.gov/> (link active as of 07/25/19). We tabulated the number of discharges, and average costs, for each mental illness below (principal diagnosis), by insurance type. Total hospital costs for each mental illness for each payer are calculated by multiplying the mean costs with the number of discharges, then divided by the total costs (Medicare + Medicaid + Private insurance + Other + Uninsured) to obtain a percentage. Hospitalizations for which the primary payer is 'missing' were excluded. The percentage of missing values for primary payer were 0.3% for serious mental illness, and 0.1% for all hospitalizations (responsible for 0.2% and 0.1% of total costs, respectively).

- Bipolar Disorder: ICD-10-CM principal diagnosis codes F30.10-31.9, F33.8, F34.81-F34.9, F39
- Major Depressive Disorder: ICD-10-CM principal diagnosis codes F32.0-F32.5, F33.0-F33.42, F33.9
- Schizophrenia: ICD-10-CM principal diagnosis codes F20.0-F20.9, F25.0-F25.9

Costs were converted from 2016 to 2018 U.S. dollar amounts with conversion factor 1.03417 (<http://www.calculator.net/inflation-calculator.html>).

### Per capita health care expenditures – Alaska and United States 2014

The data presented in this chart shows the average per capita health expenditures by state for 2014, converted to 2016 U.S.\$

Data on detailed health expenditures by state of residence 1991-2014 were retrieved from CMS (<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsStateHealthAccountsResidence.html>, link active as of 07/25/19). Data from the 2014 column from tables 11-20 in the Summary Tables file were combined to create the chart.

Additional data on health expenditures by insurance coverage were retrieved from tables 23, 26 and 29.

Costs were converted from 2014 to 2018 U.S. dollar amounts with conversion factor 1.05218. (<http://www.calculator.net/inflation-calculator.html>)

### State mental health agency spending – Alaska 2013

This chart provides data on state mental health agency expenditures per capita of each state. The expenditures are split up between spending on community-based mental health programs, mental health services in state psychiatric hospitals, and additional costs related to administration, training, research, and evaluation.

From: [State Mental Health Agency-Controlled Expenditures for Mental Health Services](#) (link active as of 12/9/16) State Fiscal Year 2013, NASMHPD Research Institute, Inc. Table 2: SMHA-Controlled expenditures by type of program (in Millions), FY'13. The specific SMHA Expenditures were divided by the number of people in each respective state and total U.S. in 2013, retrieved from the [Census Bureau statistics](#) (Total Population, 2013 American Community Survey 1-Year Estimates, link active as of 12/9/16)

Costs were converted from 2013 to 2018 U.S. dollar amounts with conversion factor 1.06765 (<http://www.calculator.net/inflation-calculator.html>).

### Availability of behavioral health care professionals – Alaska and United States 2017

This chart shows the ratio of behavioral health care professionals to the general population on a state- and national level.

- Data on number of behavioral health care professionals (including: psychiatrists, psychologists, licensed clinical social workers, counselors, marriage and family therapists and advanced practice nurses specializing in behavioral health care) were retrieved from [County Health Rankings & Roadmaps](#) (link active as of 02/27/19), 2018 County Health Rankings National Data (CSV Analytic Data, and documentation).
  - Note: data comes from the National Provider Identification data file - as participation is required for providers who transmit electronic health records, very small providers may not be included. In contrast, some professionals may have stopped practicing or are not accepting patients, but are still active in the registration system.
  - Mental Health Providers is measure number 62 (see documentation), originally retrieved from the CMS National Provider Identification file from 2017.
  - To calculate the number of providers per 10,000 residents, “measure\_62\_value” in the CSV file is multiplied by 10,000. The same exact value can be calculated by dividing “measure\_62\_numerator” by “measure\_62\_denominator” and multiplying by 10,000.
  - The average ratio is determined for all states by selecting all FIPS State Codes (including “0” for the US as a whole), and filtering for “0” in the FIPS County Code column.

### Distribution of behavioral health care professionals – Alaska and other states 2018

This chart shows the range in the number of behavioral health care professionals per capita in Alaska's boroughs and county-level equivalent areas as well as in states that have similar average numbers or states that are in closest proximity to Alaska.



- Data on number of behavioral health care professionals (including: psychiatrists, psychologists, licensed clinical social workers, counselors, marriage and family therapists and advanced practice nurses specializing in behavioral health care) were retrieved from [County Health Rankings & Roadmaps](#) (link active as of 9/26/18), 2018 County Health Rankings National Data (CSV Analytic Data, and documentation).
  - Note: data comes from the National Provider Identification data file - as participation is required for providers who transmit electronic health records, very small providers may not be included. In contrast, some professionals may have stopped practicing or are not accepting patients, but are still active in the registration system.
  - Mental Health Providers is measure number 62 (see documentation), originally retrieved from the CMS National Provider Identification file.
  - To calculate the number of providers per 10,000 residents, “measure\_62\_value” in the CSV file is multiplied by 10,000. The same exact value can be calculated by dividing “measure\_62\_numerator” by “measure\_62\_denominator” and multiplying by 10,000.
  - Counties and county-level equivalent areas are retrieved by selecting specific states with FIPS State Codes and all FIPS County Codes (except “0”) for these states. Counties without behavioral health care professionals will be manually assigned a ratio of 0.

### Availability of behavioral health care professionals and hospital beds – Alaska and United States 2014

This chart contains data on the number of psychiatrists, psychologists, primary care physicians, as well as the number of psychiatric care beds per 10,000 residents on a state-level compared to the U.S. as a whole.

Source: Area Health Resource Files 2014, MS Access Database. Variables used:

- Population Estimate 2014, retrieved from the [Census Bureau statistics](#) (Total Population, American Community Survey 1-Year Estimate, link active as of 5/31/18)
- All variables are divided by the overall population for an estimate per 10,000 residents

Providers:

- MD's, NF, Psychiatry, Total Pat Care, 2014 (in 'Health Professionals' tab)
- Phys, NF, Prim Care Pat Care Excl Hsp Rsdnts, 2014 (in 'Health Professionals' tab)

Hospitals beds:

- STG Psychiatric Care, Beds Set Up, 2013 (in 'Health Facilities', 'Inpatient Service Unit Beds' tabs)

Estimates of minimally required number of psychiatric beds is derived from [“The Shortage of Public Hospital Beds for Mentally Ill Persons”](#) by the Treatment Advocacy Center, page 8.

### Shortage of behavioral health care professionals – Alaska 2019

This infographic represents the number of full-time equivalent behavioral health care professionals who are in the current workforce in designated shortage areas and facilities in Alaska (as determined by the Health Resources and Services Administration) and the number of providers necessary to reach an optimal provider-to-patient ratio.

Source: Health Resources and Services Administration, Health Professional Shortage Area (HPSA), Mental Health. Retrieved from: <https://data.hrsa.gov/data/download> - Shortage areas, HPSA – Mental Health. Link active as of 08/01/19. Data as of 08/01/19.

File: HPSA - Mental Health, file name: BCD\_HPSA\_FCT\_DET\_MH

- Filter data by:
  - Only select unique HPSA Source Identification Numbers (In excel: Data > Advanced > Unique values only. Copy to new sheet)
  - Discipline Class Description: Mental Health
  - HPSA Status Description: “designated”
  - HPSA State Abbreviation: AK
  - HPSA Type Description: All, or Correctional Facilities separately
- Sum column totals of remaining rows (in excel: use subtotal formula with function nr 9):
  - HPSA Total Full-Time Equivalent Clinicians = 3.9
  - HPSA Shortage = 13.0
    - For Correctional Facilities, HPSA Shortage = 1.46

### State population in behavioral health care professional shortage areas

This chart shows the percentage of each state’s population that resides in a designated behavioral health care professional shortage area and/or is served by a facility that has indicated a shortage of behavioral health care professionals, as determined by the Health Resources and Services Administration.

Source: Health Resources and Services Administration, Health Professional Shortage Area (HPSA), Mental Health. Retrieved from: <https://data.hrsa.gov/data/download> - Shortage areas, HPSA – Mental Health. Link active as of 08/01/19. Data as of 08/01/19.

File: HPSA - Mental Health, file name: BCD\_HPSA\_FCT\_DET\_MH

- Filter data by:
  - Only select unique HPSA Source Identification Numbers (In excel: Data > Advanced > Unique values only. Copy to new sheet)
  - Discipline Class Description: Mental Health
  - HPSA Status Description: “designated”
  - HPSA Designation Population: exclude value 1
- Sum column totals of remaining rows by state:
  - HPSA Designation Population in AK = 276,673 (37% of 739,795, Annual Estimates of the Resident Population: 2017 for each state and the US, found at [Census Bureau statistics](#) (link active as of 08/01/19))

### Contact with criminal justice system – Alaska 2017

Using data from the National Survey on Drug Use and Health, we determined the percentage of people who have been arrested (1, 2 or 3 or more times when data are available) or have been on parole/supervised release, or were on probation in the past year, split up by serious psychological distress status.

National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 08/05/19). Variables:

- 1<sup>st</sup> step: Determine overall adult population in each state (total survey populations)
  - Row: State
  - Column: Past year serious psychological distress indicator (spdyr=1)
  - Control: Catag18 = 1 (18 or older)
- 2<sup>nd</sup> step:
  - Row: State (filter for specific state, otherwise cell size is too small to display results for some state x insurance categories)
  - Column: Past year serious psychological distress indicator (spdyr=1)
  - Control:
    - On parole/supervised release past 12 months (parolrel=1)
    - On probation at any time past 12 months (probaton=1)
    - Number of times arrested & booked in the past 12 months (NOBOOKYR=1). Multiple arrest categories are too small to show.
- Weight applied: DASWT\_1
- Used weighted counts to determine the percentages.

### Mental health issues in prison and jail populations – United States

This chart contains data from both the National Inmate Survey (state and jail inmates) and the National Survey of Drug Use and Health (non-institutionalized population) to compare the percentage of people with serious psychological distress in the past month.

- Current serious psychological distress status of inmates in prisons/jails:  
From Bureau of Justice report: Sexual Victimization in Prisons and Jails Reported by Inmates, 2011-12 (table 14, page 24), based on data from the National Inmate Survey, 2011-12 <https://www.bjs.gov/content/pub/pdf/svpjri1112.pdf> (link active as of 12/9/16)
- In non-institutionalized adult population. National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> (link active as of 03/19/19). Variable: spdmon=1 – Past month serious psychological distress indicator, recoded from K6SCMAX>=13 (based on past month and worst month K6 score). Weight applied: DASWT\_1

### State prison population with serious mental illness – Alaska

This chart shows the percentage of state prisoners previously diagnosed with serious mental illnesses, and the overlap in diagnoses. The Venn diagram shows percentages in each category with one, two or three diagnoses of depressive disorder, bipolar disorder (or manic depression, or mania), and schizophrenia (or other psychotic disorder). As a result of rounding, percentages in Venn diagram may not add up to the total percentage of state prisoners with any serious mental illness (bar chart).

- Lifetime diagnosis of specific SMI among state prison inmates:  
Survey of Inmates in State and Federal Correctional Facilities, 2004 (ICPSR 4572). At <http://www.icpsr.umich.edu/icpsrweb/NACJD/studies/4572> (link active as of 06/01/18). Dataset DS2: State Numeric. ASCII+SAS setup files, converted to Stata files using StatTransfer. Variables used:
  - State: V1056: S5Q15A\_FIPS: AT ARREST - RESIDENCE (STATE) = 2
  - Mental illnesses:
    - Major Depressive Disorder: V2401: S9Q9A\_1: EVER DIAGNOSED - A DEPRESSIVE DISORDER

- Bipolar Disorder: V2402: S9Q9A\_2: EVER DIAGNOSED - MANIC-DEPRESSION, BIPOLAR DISORDER, OR MANIA
  - Schizophrenia: V2403: S9Q9A\_3: EVER DIAGNOSED - SCHIZOPHRENIA OR ANOTHER PSYCHOTIC DISORDER
- Weight: V2927 – FINALWT: FINAL WEIGHT
- Missing data values are included in total percentage
- Proportional Venn diagram created with EulerAPE

### Change in treatment before and during incarceration in prison and jails – United States

Using survey data from jail, state and federal prisons, we calculated the percentage of current inmates who have received medication or counseling in the year before arrest, and since admission. The group representing 100% consists of inmates who have been previously diagnosed with depressive disorder, bipolar disorder and/or schizophrenia, and who have ever received medication (in the “Medication” graph on the left) or counseling (in the “Counseling” graph on the right) in the past.

- Survey of Inmates in Local Jails, 2002 (ICPSR 4359).  
<http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/4359> (link active as of 12/9/16).  
 Dataset DS1: Numeric Data. ASCII+SAS setup files, converted to Stata files using StatTransfer. Variables used:
  - Weight: V2264 FINALWT - 2002 SILJ FINAL WEIGHT
  - Mental illness: Have you ever been told by a mental health professional, such as a psychiatrist or psychologist, that you had:
    - Major Depressive Disorder: V2022 S9Q10A\_1 – A depressive disorder
    - Bipolar Disorder: V2023 S9Q10A\_2 – Manic-depression, bipolar disorder, or mania
    - Schizophrenia: V2024 S9Q10A\_3 – Schizophrenia or another psychotic disorder
  - Treatment variables:
    - V2030 S9Q11A - EVER BEEN MEDICATED FOR MENTAL PROBLEM
    - V2031 S9Q11B\_1 - TAKING SUCH MED IN YEAR PRIOR TO ARREST
    - V2033 S9Q11C - TAKEN SUCH MED SINCE ADMISSION
    - V2038 S9Q13A – EVER RECEIVED COUNSELING FOR MENTAL HEALTH PROBLEMS
    - V2039 S9Q13B - RECEIVED SUCH COUNSELING IN PRIOR YEAR OF ARREST
    - V2040 S9Q13C - RECEIVED SUCH COUNSELING SINCE ADMISSION
- Survey of Inmates in State and Federal Correctional Facilities, 2004 (ICPSR 4572)  
<http://www.icpsr.umich.edu/icpsrweb/NACJD/studies/4572> (link active as of 12/9/16).  
 Dataset DS1 (Federal) & DS2 (State) Numeric Data. ASCII+SAS setup files, converted to Stata files using StatTransfer. Variables used:
  - Weight: V2927 FINALWT: FINAL WEIGHT
  - Mental illness: Have you ever been told by a mental health professional, such as a psychiatrist or psychologist, that you had:
    - Major Depressive Disorder: V2401 - S9Q9A\_1: EVER DIAGNOSED - A DEPRESSIVE DISORDER
    - Bipolar Disorder: V2402 - S9Q9A\_2: EVER DIAGNOSED - MANIC-DEPRESSION, BIPOLAR DISORDER, OR MANIA
    - Schizophrenia: V2403 - S9Q9A\_3: EVER DIAGNOSED - SCHIZOPHRENIA OR ANOTHER PSYCHOTIC DISORDER
  - Treatment variables:
    - V2409 - S9Q10A: EVER TAKEN A MEDICATION FOR MENTAL CONDITIONS

- V2410 - S9Q10B\_1: IN YEAR PRIOR TO ADMISSION, TAKEN MEDICATION FOR MENTAL CONDITION
- V2412 - S9Q10C: TAKEN MEDICATION FOR A MENTAL CONDITION SINCE ADMISSION
- V2417 - S9Q12A: EVER RECEIVED COUNSELING FROM TRAINED PROFESSIONAL (because of mental or emotional problem)
- V2418 - S9Q12B: RECEIVED COUNSELING DURING THE 12 MONTHS BEFORE ARREST
- V2419 - S9Q12C: RECEIVED COUNSELING SINCE ADMISSION
- Including missing-data values in percentages

### Costs of Alaska State prison population with SMI

This chart provides an estimate on the number of state prisoners previously diagnosed with serious mental illness, and an estimate of the overall annual costs of incarceration of these prisoners.

- Total general expenditures for corrections in Alaska in 2017: \$316,353,000. From the Annual Survey of State Government Finances (General Expenditure – by function: Corrections) <https://www.census.gov/programs-surveys/state.html> (link active as of 08/05/19).
- Alaska Department of Corrections 2017 Offender Profile, Number of offenders in all institutions. Page 8, bottom table. Total Population: 4,237 <http://www.correct.state.ak.us/admin/docs/2017Profile.pdf> (link active as of 08/05/19)
- Used percentage of 22% from Survey of Inmates in State and Federal Correctional Facilities, 2004 (see [State prison population with serious mental illness](#)) to calculate the number of Alaska state prison inmates with previous diagnosis of serious mental illness (22% of 4,237 = 923) and the costs for this group of people = 22% of \$316,353,000 = \$69,597,660)
- Conversion factor of 1.02130 to convert from 2017 to 2018 U.S. \$ (<http://www.calculator.net/inflation-calculator.html>).

### Economic burden of serious mental illness – Alaska 2018

This chart shows an estimate of the total state economic burden of schizophrenia, bipolar disorder, and major depressive disorder. Because of symptom overlap, diagnoses of mental illnesses are not mutually exclusive, therefore, patients with two or more diagnoses may be represented in multiple categories.

- From: MacEwan JP, Seabury S, et al. Pharmaceutical innovation in the treatment of schizophrenia and mental disorders compared with other diseases. *Innov Clin Neurosci*. 2016 Aug 1;13(7-8):17-25. Using:
  - “Burden Per Patient” amount from table 1:
    - \$46,537/Schizophrenia patient
    - \$20,571/BD patient
    - \$14,100/MDD patient
  - Prevalence numbers of mental illnesses from [Estimated number of people living with mental illness – Alaska 2017](#)
  - Conversion factor of 1.05218 to obtain estimate economic burden for each mental illness from 2014 U.S.\$ to 2018 U.S.\$ (<http://www.calculator.net/inflation-calculator.html>).

### Economic burden of serious mental illness – United States 2018

This chart shows an estimate of the total national economic burden of schizophrenia, bipolar disorder, and major depressive disorder. Because of symptom overlap, diagnoses of mental illnesses are not mutually exclusive, therefore, patients with two or more diagnoses may be represented in multiple categories.

- Based on: MacEwan JP, Seabury S, et al. Pharmaceutical innovation in the treatment of schizophrenia and mental disorders compared with other diseases. *Innov Clin Neurosci*. 2016 Aug 1;13(7-8):17-25. Using:
  - “Burden Per Patient” amount from table 1:
    - \$46,537/Schizophrenia patient
    - \$20,571/BD patient
    - \$14,100/MDD patient
  - Prevalence numbers of mental illnesses from [Prevalence of Mental Illness – United States](#)
  - Adult population (18 and over) in 2017 of 252,070,495, retrieved from the [Census Bureau statistics](#) website (Comparative Demographic Estimates, 2017 American Community Survey 1-Year Estimates, link active as of 07/16/19)
  - Conversion factor of 1.05218 to obtain estimate economic burden for each mental illness from 2014 U.S.\$ to 2018 U.S.\$ (<http://www.calculator.net/inflation-calculator.html>).

### Lost productivity is the largest contributor to economic burden of serious mental illness – United States

This chart shows an estimate of the economic burden of schizophrenia, bipolar disorder, and major depressive disorder split in three categories: lost productivity, medical costs, and other costs. Because of symptom overlap, diagnoses of mental illnesses are not mutually exclusive, therefore, patients with two or more diagnoses may be represented in multiple categories.

- Based on: MacEwan JP, Seabury S, et al. Pharmaceutical innovation in the treatment of schizophrenia and mental disorders compared with other diseases. *Innov Clin Neurosci*. 2016 Aug 1;13(7-8):17-25.
- The amounts were converted to proportions when not already available.
- See descriptions in original papers to get more details on subcategories that are used to determine how the total economic burden is calculated.
- **Schizophrenia (see Table 1 in paper):**
  - Original source: Cloutier M, Aigbogun MS, Guerin A, Nitulescu R, Ramanakumar AV, Kamat SA, DeLucia M, Duffy R, Legacy SN, Henderson C, Francois C, Wu E. The Economic Burden of Schizophrenia in the United States in 2013. *J Clin Psychiatry*. 2016 Jun;77(6):764-71.
  - Medical costs consist of “Excess direct health care costs” (Drugs, Outpatient, Inpatient, Emergency room, Long-term care, and Other medical services).
  - Lost productivity consists of “Excess indirect costs” (Unemployment, Productivity loss, Premature mortality (suicide), and Caregiving)
  - Other consists of “Law enforcement” (Incarceration, Judicial and legal services, Police protection), “Shelters for the homeless”, and “Schizophrenia-related research and training”.
  - “Cost offsets” were proportionally subtracted from Inpatient, Long-term care, Law enforcement, and Shelters for the homeless subcategories before creating a sum within each main category

- **BD (see Table 1 in paper):**
  - Original source: Wyatt RJ, Henter I. An economic evaluation of manic-depressive illness–1991. Soc Psychiatry Psychiatr Epidemiol. 1995 Aug;30(5):213-9.
  - Medical costs consist of “Treatment-related” (Total inpatient costs, Total outpatient costs, Total nursing home, intermediate, domiciliary care costs, Medication, Substance abuse)
  - Lost productivity consists of “Indirect costs” (Lost productivity homemakers, Lost productivity institutions, Lost productivity suicide, Lost family productivity, Los compensation).
  - Other consists of “Non-treatment-related” (Total crime (includes jails/prisons), Suicide (direct medical/law enforcement portion), Research/Training)
  - “Transfer costs” were proportionally subtracted from Total inpatient costs, Total nursing home, intermediate, domiciliary care costs, Shelters, and Total crime subcategories before creating a sum within each main category above
- **MDD (see Table 2, part A, in paper):**
  - Original source: Greenberg PE, Fournier AA, Sisitsky T, Pike CT, Kessler RC. J Clin Psychiatry. The economic burden of adults with major depressive disorder in the United States (2005 and 2010). 2015 Feb;76(2):155-62.
  - Medical costs consist of “Direct costs” (Medical services, Outpatient, Inpatient, Emergency Department, Other medical services, Pharmaceutical services)
  - Lost productivity consists of “Suicide-related costs” and “Workplace costs (Absenteeism, Presenteeism).

### Substance abuse in people with serious psychological distress – Alaska 2017

This chart provides data on the percentage of people who experienced serious psychological distress in the past 12 months and who were dependent on, or abused alcohol or illicit drugs during the same time frame.

From National Survey on Drug Use and Health (2-year R-DAS 2016-2017) <https://rdas.samhsa.gov> link active as of 08/05/19). Variables:

- Row: State (filter for specific state, otherwise cell size is too small to display results for some state x SPD categories).
- Column: Past year serious psychological distress indicator (spdyr=1)
- Control:
  - udpyilal=1, illicit drug or alcohol dependence or abuse in past year
  - abodalc=1, alcohol dependence or abuse in past year
  - udpyill=1, any illicit drug dependence or abuse in past year
  - udpyprnr=1, prescription pain reliever dependence or abuse in past year
    - Cell size too small to display for Alaska
- Weight applied: DASWT\_1
- Used weighted counts to determine the percentages.

### Opioid-related hospitalization and emergency department visit rates are on the rise – United States 2005-2016

This chart shows the rate of inpatient hospitalizations and ED visits for opioid dependency, non-dependent abuse, and opioid overdoses for the US from 2005-2016.

National data from 2005-2016, retrieved from AHRQ HCUP Fast Stats, exported data table (Annual Rates tab; Setting: IP or ED) <https://www.hcup-us.ahrq.gov/faststats/OpioidUseServlet> (link active as of 08/06/19). The following opioid-related ICD-9 diagnostic codes (all-listed diagnoses) are included in the chart for all time points prior to October 1, 2015:

- 304.00 – 304.02: Opioid type dependence
- 304.70 – 304.72: Combinations of opioid type drug with any other drug dependence
- 305.50 – 305.52: Opioid abuse
- 965.00 – 965.02; 965.09: Poisoning by opium (alkaloids), unspecified; heroin; methadone; other opiates and related narcotics
- 970.1: Poisoning by opiate antagonists
- E850.0 – E850.2: Accidental poisoning by heroin; methadone; other opiates and related narcotics
- E935.0 – E935.2: Heroin, methadone, other opiates and related narcotics causing adverse effects in therapeutic use
- E940.1: Opiate antagonists causing adverse effects in therapeutic use

#### ICD-10 Codes Starting October 1, 2015

- F11 series: Opioid-related disorders (except F11.21)
- T40 series: Poisoning by, adverse effect of, and underdosing of narcotics and psychodysleptics [hallucinogens]; includes poisoning accidental, intentional self-harm, assault, undetermined, and adverse effect (except heroin); with a seventh digit indicating initial, subsequent encounter, sequela
  - 0X1, 0X2, 0X3, 0X4, 0X5: Opium
  - 1X1, 1X2, 1X3, 1X4: Heroin
  - 2X1, 2X2, 2X3, 2X4, 2X5: Other opioids
  - 3X1, 3X2, 3X3, 3X4, 3X5: Methadone
  - 4X1, 4X2, 4X3, 4X4, 4X5: Other synthetic narcotics
  - 601, 602, 603, 604, 605: Unspecified narcotics
  - 691, 692, 693, 694, 695: Other narcotics

The unit of analysis is the number of discharges per year per 100,000 residents.

#### [Prescribing of opioids started to decrease in 2007– Alaska and United States 1998-2014](#)

This chart shows data from ARCOS (Automation of Reports and Consolidated Orders System), which is a proxy for the quantity of DEA-controlled substances that are sold and dispensed to patients.

From <https://www.deadiversion.usdoj.gov/arcos/#background> (link active as of 10/02/17):

“ARCOS is an automated, comprehensive drug reporting system which monitors the flow of DEA controlled substances from their point of manufacture through commercial distribution channels to point of sale or distribution at the dispensing/retail level - hospitals, retail pharmacies, practitioners, mid-level practitioners, and teaching institutions. Included in the list of controlled substance transactions tracked by ARCOS are the following: All Schedules I and II materials (manufacturers and distributors); Schedule III narcotic and gamma-hydroxybutyric acid (GHB) materials (manufacturers and distributors); and selected Schedule III and IV psychotropic drugs (manufacturers only).”



The data are presented in “Morphine milligram equivalency per capita”, by dividing the Morphine milligram equivalency for Alaska and the U.S. by the annual estimates of the respective resident population.

### Fatal overdoses by opioids are on the rise – Alaska and United States 1999-2017

This data chart shows the rate of fatal poisoning that was due to opioids over time, based on data from the Centers of Disease Control and Prevention.

Data are retrieved from CDC Wonder (<https://wonder.cdc.gov>), Multiple Cause of Death Data. The ICD-10 codes include in this chart are:

- T40.1 Poisoning by narcotics and psychodysleptics [hallucinogens] - heroin
- T40.2 Poisoning by narcotics and psychodysleptics [hallucinogens] - other opioids
- T40.3 Poisoning by narcotics and psychodysleptics [hallucinogens] - methadone
- T40.4 Poisoning by narcotics and psychodysleptics [hallucinogens] - Other synthetic narcotics
- T40.6 Poisoning by narcotics and psychodysleptics [hallucinogens] - Other and unspecified narcotics

Deaths with multiple codes from T40 category are classified in this order: heroin, methadone, opium, other opioids, other synthetic narcotics, other and unspecified narcotics.

The number of deaths for each year for each ICD-10 subcategory are summed, and divided by the annual estimates of the resident population that are provided by CDC Wonder.

### Age distribution of fatal overdoses by opioids and heroin – United States 2011-2017

This data chart shows the rate of fatal poisoning that was due to opioids from 2011 to 2017, split by type of opioid (heroin, or other) and age, based on data from the Centers of Disease Control and Prevention.

Data are retrieved from CDC Wonder (<https://wonder.cdc.gov>), Multiple Cause of Death Data. The ICD-10 codes include in this chart are:

#### Heroin:

- T40.1 Poisoning by narcotics and psychodysleptics [hallucinogens] – heroin

#### Opioids:

- T40.2 Poisoning by narcotics and psychodysleptics [hallucinogens] - other opioids
- T40.3 Poisoning by narcotics and psychodysleptics [hallucinogens] - methadone
- T40.4 Poisoning by narcotics and psychodysleptics [hallucinogens] - Other synthetic narcotics
- T40.6 Poisoning by narcotics and psychodysleptics [hallucinogens] - Other and unspecified narcotics

Deaths with multiple codes from T40 category are classified in this order: heroin, methadone, opium, other opioids, other synthetic narcotics, other and unspecified narcotics.

The number of deaths from 2011 to 2017 are summed for each ICD-10 subcategory, and for each 5-year age bin. These numbers are then divided by the sum of annual estimates of the resident population in 2011 to 2015, in each age category (annual estimates for age bins are included in CDC data output).