

Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Statistical Brief #260: Social Determinants of Health and County Population Rates of Opioid-Related Inpatient Stays and Emergency Department Visits, 2016 (Owens PL, Weiss AJ, Barrett ML, Reid LD)

Appendix A.1. Supplemental data sources for county characteristics

Characteristic	Description	Data source	Website	Year
<i>Social, educational, and economic characteristics</i>				
Demographics				
Age distribution	Percentage of county population who were in the following age groups: 15–17 years, 18–44 years, 45–64 years, and 65+ years	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Sex distribution	Percentage of county population who were female	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Race distribution	Percentage of county population who were in the following racial groups: White; Black or African American; American Indian or Alaska Native; Asian; Native Hawaiian or Other Pacific Islander; Other, 2 or more races	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Ethnicity	Percentage of county population who were Hispanic/Latino	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Education				
Associate's degree or higher	Percentage of county population aged 25 years or older with an associate's degree or higher	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Poverty/income				
Poverty	Percentage of county population in poverty	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Housing costs	Percentage of occupied units in the county with housing costs equal to or greater than 30 percent of household income	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Employment				
Unemployment rate	Percentage of county population aged 16 years or older who were unemployed	Local Area Unemployment Statistics, U.S. Department of Labor Bureau of Labor Statistics	www.bls.gov	2016
Social factors				
Single parent households	Percentage of children in family households in the county living in single parent households	American Community Survey, U.S. Census Bureau	data.census.gov	2016
Religious affiliation	Percentage of the county population affiliated with a religious congregation	U.S. Religion Census, Association of Statisticians of American Religious Bodies	www.usreligioncensus.org	2010

Characteristic	Description	Data source	Website	Year
Community safety				
Property crime	Property crimes reported per 1,000 county population for which crimes are reported	Uniform Crime Reporting Program Data, Inter-university Consortium for Political and Social Research	www.icpsr.umich.edu	2014
Violent crime	Violent crimes reported per 1,000 county population for which crimes are reported	Uniform Crime Reporting Program Data, Inter-university Consortium for Political and Social Research	www.icpsr.umich.edu	2014
Physical infrastructure				
Population				
Population density	Number of residents in the county per square mile of land	American Community Survey, U.S. Census Bureau	data.census.gov	2016 (land area data from 2010)
Urban/rural designation	County designation as metropolitan (counties in metro areas regardless of population size); rural, adjacent to metropolitan (counties adjacent to metro areas, regardless of population size); or rural, remote (counties in areas not adjacent to metro areas regardless of population size)	Rural-Urban Continuum Codes, U.S. Department of Agriculture Economic Research Service	www.ers.usda.gov/data-products/rural-urban-continuum-codes/	2016
Residential segregation	Non-White/White residential segregation index value (low, moderate, high, or none) for the county. The index of dissimilarity is a demographic measure of the evenness with which non-White and White residents are distributed across census tracts that make up a county. The index score can be interpreted as the percentage of White or non-White population who would have to move to a different census tract to produce a distribution that matches that of the county.	County Health Rankings & Roadmaps, Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute	www.countyhealthrankings.org	2010–2014
Food access				
Food environment	Food Environment Index score for the county. The index ranges from 0 (worst) to 10 (best) and equally weights two indicators: limited access to healthy foods (i.e., the percentage of the population that is low income and does not live close to a grocery store) and food insecurity (i.e., the percentage of the population without access to a reliable source of food).	County Health Rankings & Roadmaps, Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute	www.countyhealthrankings.org	2013

Characteristic	Description	Data source	Website	Year
Housing				
Severe housing problems	Percentage of households in the county living with overcrowding, high housing costs, lack of kitchen facilities, or lack of plumbing facilities	County Health Rankings & Roadmaps, Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute	www.countyhealthrankings.org	2008-2012
Healthcare characteristics				
Availability of services				
Total hospital beds	Number of hospital beds per 100,000 county population ¹	Annual Survey of Hospitals, American Hospital Association	www.ahadata.com/aha-annual-survey-database	2016
Federally Qualified Health Centers (FQHCs)	Number of FQHCs in the county	Area Health Resources Files, Health Resources & Services Administration	data.hrsa.gov/topics/health-workforce/ahrf	2016
Primary care physician availability	Number of primary care physicians per 100,000 county population ¹	Area Health Resources Files, Health Resources and Services Administration	data.hrsa.gov/topics/health-workforce/ahrf	2015
Psychiatrist availability	Number of psychiatrists per 100,000 county population ¹	Area Health Resources Files, Health Resources and Services Administration	data.hrsa.gov/topics/health-workforce/ahrf	2015
Psychiatric hospital beds	Number of psychiatric hospital beds per 100,000 county population ¹	Annual Survey of Hospitals, American Hospital Association	www.ahadata.com/aha-annual-survey-database	2016
Buprenorphine provider availability	Number of practitioners waived to provide buprenorphine for the treatment of opioid use disorder per 100,000 county population ¹	Buprenorphine Treatment Practitioner Locator, Substance Abuse and Mental Health Services Administration	www.samhsa.gov/medication-assisted-treatment/physician-program-data/treatment-physician-locator	2018
Pharmacy density	Number of pharmacies in the county per 100 square miles ²	County Business Patterns, U.S. Census Bureau	www.census.gov/programs-surveys/cbp.html	2016
Access to care: insurance				
Insurance enrollment	Percentage of county population enrolled in Medicare, Medicaid, or private insurance, or with no insurance	American Community Survey, U.S. Census Bureau	data.census.gov	2016

¹ Characteristic was calculated “per 100,000 county population” using county population data from the U.S. Census Bureau American Community Survey, 2016, data.census.gov.

² Characteristic was calculated “per 100 square miles” using land area data from the U.S. Census Bureau American Community Survey, 2010, data.census.gov.

Characteristic	Description	Data source	Website	Year
State-level opioid-related activity and healthcare policies				
Law enforcement seizures of fentanyl	Number of law enforcement illicit drug seizures in the state that were tested and confirmed to contain fentanyl	Opioid & Health Indicators Database, amfAR	opioid.amfar.org/indicator/fentanyl-seize	2016
Naloxone prescription availability	State permitted naloxone prescriptions for third parties (i.e., people with whom the prescriber does not have a prescriber-patient relationship), either for a portion of the year or for the entire year	Naloxone Overdose Prevention Laws Dataset, Prescription Drug Abuse Policy System	pdaps.org	2016
Prescription drug monitoring program (PDMP) data sharing	State permitted the PDMP to share data with other State PDMPs, either for a portion of the year or for the entire year	PDMP Reporting and Authorized Use Dataset, Prescription Drug Abuse Policy System	pdaps.org	2016
Prescribers required to check PDMP	State required prescribers to check the PDMP before prescribing controlled substances, for the entire year	PDMP Reporting and Authorized Use Dataset, Prescription Drug Abuse Policy System	pdaps.org	2016
Medicaid expansion	State had adopted Medicaid Expansion	State Health Facts: Status of State Action on the Medicaid Expansion, Kaiser Family Foundation	www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/	2016
County-level opioid prescribing rate				
Opioid prescribing	Opioid prescriptions per 100 county residents per year	U.S. Opioid Prescribing Rate Maps, Centers for Disease Control and Prevention	www.cdc.gov/drugoverdose/maps/rxcounty2016.html	2016
State-level opioid mortality rate				
Opioid mortality	Opioid-related deaths per 100,000 State population (age-adjusted)	State Health Facts: Opioid Overdose Death Rates and All Drug Overdose Death Rates, Kaiser Family Foundation (analysis of data from Centers for Disease Control and Prevention WONDER Online Database)	www.kff.org/other/state-indicator/opioid-overdose-death-rates	2016

Appendix A.2. ICD-10-CM diagnosis codes defining opioid-related inpatient stays and emergency department visits

ICD-10-CM diagnosis code	Description
F11.10	Opioid abuse, uncomplicated
F11.120	Opioid abuse with intoxication, uncomplicated
F11.121	Opioid abuse with intoxication, delirium
F11.122	Opioid abuse with intoxication, with perceptual disturbance
F11.129	Opioid abuse with intoxication, unspecified
F11.14	Opioid abuse with opioid-induced mood disorder
F11.150	Opioid abuse with opioid-induced psychotic disorder, with delusions
F11.151	Opioid abuse with opioid-induced psychotic disorder, with hallucinations
F11.159	Opioid abuse with opioid-induced psychotic disorder, unspecified
F11.181	Opioid abuse with opioid-induced sexual dysfunction
F11.182	Opioid abuse with opioid-induced sleep disorder
F11.188	Opioid abuse with other opioid-induced disorder
F11.19	Opioid abuse with unspecified opioid-induced disorder
F11.20	Opioid dependence, uncomplicated
F11.220	Opioid dependence with intoxication, uncomplicated
F11.221	Opioid dependence with intoxication, delirium
F11.222	Opioid dependence with intoxication, with perceptual disturbance
F11.229	Opioid dependence with intoxication, unspecified
F11.23	Opioid dependence with withdrawal
F11.24	Opioid dependence with opioid-induced mood disorder
F11.250	Opioid dependence with opioid-induced psychotic disorder, with delusions
F11.251	Opioid dependence with opioid-induced psychotic disorder, with hallucinations
F11.259	Opioid dependence with opioid-induced psychotic disorder, unspecified
F11.281	Opioid dependence with opioid-induced sexual dysfunction
F11.282	Opioid dependence with opioid-induced sleep disorder
F11.288	Opioid dependence with other opioid-induced disorder
F11.29	Opioid dependence with unspecified opioid-induced disorder
F11.90	Opioid use, unspecified, uncomplicated
F11.920	Opioid use, unspecified with intoxication, uncomplicated
F11.921	Opioid use, unspecified with intoxication delirium
F11.922	Opioid use, unspecified with intoxication, with perceptual disturbance
F11.929	Opioid use, unspecified with intoxication, unspecified
F11.93	Opioid use, unspecified, with withdrawal
F11.94	Opioid use, unspecified, with opioid-induced mood disorder
F11.950	Opioid use, unspecified with opioid-induced psychotic disorder, with delusions
F11.951	Opioid use, unspecified with opioid-induced psychotic disorder, with hallucinations
F11.959	Opioid use, unspecified with opioid-induced psychotic disorder, unspecified
F11.981	Opioid use, unspecified with opioid-induced sexual dysfunction
F11.982	Opioid use, unspecified with opioid-induced sleep disorder

ICD-10-CM diagnosis code	Description
F11.988	Opioid use, unspecified with other opioid-induced disorder
F11.99	Opioid use, unspecified, with unspecified opioid-induced disorder
T40.0X1A	Poisoning by opium, accidental (unintentional), initial encounter
T40.0X1D	Poisoning by opium, accidental (unintentional), subsequent encounter
T40.0X2A	Poisoning by opium, intentional self-harm, initial encounter
T40.0X2D	Poisoning by opium, intentional self-harm, subsequent encounter
T40.0X3A	Poisoning by opium, assault, initial encounter
T40.0X3D	Poisoning by opium, assault, subsequent encounter
T40.0X4A	Poisoning by opium, undetermined, initial encounter
T40.0X4D	Poisoning by opium, undetermined, subsequent encounter
T40.0X5A	Adverse effect of opium, initial encounter
T40.0X5D	Adverse effect of opium, subsequent encounter
T40.1X1A	Poisoning by heroin, accidental (unintentional), initial encounter
T40.1X1D	Poisoning by heroin, accidental (unintentional), subsequent encounter
T40.1X2A	Poisoning by heroin, intentional self-harm, initial encounter
T40.1X2D	Poisoning by heroin, intentional self-harm, subsequent encounter
T40.1X3A	Poisoning by heroin, assault, initial encounter
T40.1X3D	Poisoning by heroin, assault, subsequent encounter
T40.1X4A	Poisoning by heroin, undetermined, initial encounter
T40.1X4D	Poisoning by heroin, undetermined, subsequent encounter
T40.2X1A	Poisoning by other opioids, accidental (unintentional), initial encounter
T40.2X1D	Poisoning by other opioids, accidental (unintentional), subsequent encounter
T40.2X2A	Poisoning by other opioids, intentional self-harm, initial encounter
T40.2X2D	Poisoning by other opioids, intentional self-harm, subsequent encounter
T40.2X3A	Poisoning by other opioids, assault, initial encounter
T40.2X3D	Poisoning by other opioids, assault, subsequent encounter
T40.2X4A	Poisoning by other opioids, undetermined, initial encounter
T40.2X4D	Poisoning by other opioids, undetermined, subsequent encounter
T40.2X5A	Adverse effect of other opioids, initial encounter
T40.2X5D	Adverse effect of other opioids, subsequent encounter
T40.3X1A	Poisoning by methadone, accidental (unintentional), initial encounter
T40.3X1D	Poisoning by methadone, accidental (unintentional), subsequent encounter
T40.3X2A	Poisoning by methadone, intentional self-harm, initial encounter
T40.3X2D	Poisoning by methadone, intentional self-harm, subsequent encounter
T40.3X3A	Poisoning by methadone, assault, initial encounter
T40.3X3D	Poisoning by methadone, assault, subsequent encounter
T40.3X4A	Poisoning by methadone, undetermined, initial encounter
T40.3X4D	Poisoning by methadone, undetermined, subsequent encounter
T40.3X5A	Adverse effect of methadone, initial encounter
T40.3X5D	Adverse effect of methadone, subsequent encounter
T40.4X1A	Poisoning by other synthetic narcotics, accidental (unintentional), initial encounter

ICD-10-CM diagnosis code	Description
T40.4X1D	Poisoning by other synthetic narcotics, accidental (unintentional), subsequent encounter
T40.4X2A	Poisoning by other synthetic narcotics, intentional self-harm, initial encounter
T40.4X2D	Poisoning by other synthetic narcotics, intentional self-harm, subsequent encounter
T40.4X3A	Poisoning by other synthetic narcotics, assault, initial encounter
T40.4X3D	Poisoning by other synthetic narcotics, assault, subsequent encounter
T40.4X4A	Poisoning by other synthetic narcotics, undetermined, initial encounter
T40.4X4D	Poisoning by other synthetic narcotics, undetermined, subsequent encounter
T40.4X5A	Adverse effect of other synthetic narcotics, initial encounter
T40.4X5D	Adverse effect of other synthetic narcotics, subsequent encounter
T40.601A	Poisoning by unspecified narcotics, accidental (unintentional), initial encounter
T40.601D	Poisoning by unspecified narcotics, accidental (unintentional), subsequent encounter
T40.602A	Poisoning by unspecified narcotics, intentional self-harm, initial encounter
T40.602D	Poisoning by unspecified narcotics, intentional self-harm, subsequent encounter
T40.603A	Poisoning by unspecified narcotics, assault, initial encounter
T40.603D	Poisoning by unspecified narcotics, assault, subsequent encounter
T40.604A	Poisoning by unspecified narcotics, undetermined, initial encounter
T40.604D	Poisoning by unspecified narcotics, undetermined, subsequent encounter
T40.605A	Adverse effect of unspecified narcotics, initial encounter
T40.605D	Adverse effect of unspecified narcotics, subsequent encounter
T40.691A	Poisoning by other narcotics, accidental (unintentional), initial encounter
T40.691D	Poisoning by other narcotics, accidental (unintentional), subsequent encounter
T40.692A	Poisoning by other narcotics, intentional self-harm, initial encounter
T40.692D	Poisoning by other narcotics, intentional self-harm, subsequent encounter
T40.693A	Poisoning by other narcotics, assault, initial encounter
T40.693D	Poisoning by other narcotics, assault, subsequent encounter
T40.694A	Poisoning by other narcotics, undetermined, initial encounter
T40.694D	Poisoning by other narcotics, undetermined, subsequent encounter
T40.695A	Adverse effect of other narcotics, initial encounter
T40.695D	Adverse effect of other narcotics, subsequent encounter

Abbreviation: ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification