

Life Course Indicator: Suicide

The Life Course Metrics Project

As MCH programs begin to develop new programming guided by a life course framework, measures are needed to determine the success of their approaches. In response to the need for standardized metrics for the life course approach, AMCHP launched a project designed to identify and promote a set of indicators that can be used to measure progress using the life course approach to improve maternal and child health. This project was funded with support from the [W.K. Kellogg Foundation](#).

Using an RFA process, AMCHP selected seven state teams, Florida, Iowa, Louisiana, Massachusetts, Michigan, Nebraska and North Carolina, to propose, screen, select and develop potential life course indicators across four domains: Capacity, Outcomes, Services, and Risk. The first round of indicators, proposed both by the teams and members of the public included 413 indicators for consideration. The teams distilled the 413 proposed indicators down to 104 indicators that were written up according to three data and five life course criteria for final selection.

In June of 2013, state teams selected 59 indicators for the final set. The indicators were put out for public comment in July 2013, and the final set was released in the Fall of 2013.

Basic Indicator Information

Name of indicator: Suicide (LC-45)

Brief description: Suicides per 100,000 population ages 10 and older, age-adjusted

Indicator category: Mental Health

Indicator domain: Risk/Outcome

Numerator: Number of suicides to persons ages 10 and older

Denominator: Total population ages 10 and older

Potential modifiers:

- Specific age groups (age-specific mortality rates)
- Race
- Gender
- Geographic location-state, U.S. Territory, county, census tract
- Education, occupation and other variables from the mortality file

Data source: National Vital Statistics System (NVSS) Records

Notes on calculation: The ICD-10 codes denoting suicide are X60-X84, Y87.0, and U03. In the NVSS mortality data set, the ICD-10 codes have been grouped into 39 underlying causes of death, one of which is suicide and can be used to calculate this indicator. Because the suicide rate for people under 10 is very small and the Centers for Disease Control and Prevention (CDC) WISQARS system only provides suicide mortality rates for people ages 10 and older, the numerator and denominator should be restricted to people ages 10 and older. Because of differences in population distribution by age, suicide rates should be age-adjusted when examined as a total rate. The CDC presents age-adjusted rates using the standard 2000 population; a reference for calculating age-adjusted rates using this population can be accessed here:

cdc.gov/nchs/data/statnt/statnt20.pdf

Similar measures in other indicator sets: HP 2020 Focus area MHMD-1 (Leading Health Indicator); Title V Performance Measure #16 (subset of this indicator)

Life Course Criteria

Introduction

Suicide is the 10th leading cause of death among all Americans and is among the top five leading causes of death among Americans under age 45. An average of 33,000 suicide deaths occurred each year in the United States between 2001 and 2009, which equates to more than one death every 15 minutes [2]. Suicide affects many more people than those who die from this cause. Family, friends, classmates and coworkers of the suicide victim are negatively affected through emotional suffering and social stigma that is associated with suicide. People who have been bereaved by suicide are at higher risk for suicidal thoughts and behaviors themselves. Individuals may not die by suicide, but can still suffer from suicidal behaviors or suicidal thoughts. For every death by suicide there are more than 30 attempted suicides [2]. While suicide is often thought of as strictly a mental health issue, it is actually a complete health issue requiring preventive efforts from state and local government, health care systems, physicians, businesses, educational institutions, and community organizations. The existing literature supports that the indicator, suicide, is highly connected to our current scientific understanding of life course health.

Implications for equity

Suicide is a complex human behavior, with no single determining cause. The factors that affect the likelihood of a person attempting or dying by suicide include: prior suicide attempt(s), psychiatric problems and depressive disorders, substance abuse, and access to lethal means [3]. The highest suicide rates are among Non-Hispanic Whites and American Indian/Alaska Native. Among males, Asian/Pacific Islanders have the lowest suicide rates while among females, Non-Hispanic Blacks have the lowest suicide rate [3]. Men die by suicide four times as often as women and represent 78.8 percent of all U.S. suicides. However, women attempt suicide two to three times as often as men and are more likely to have suicidal thoughts. Although most U.S. suicide deaths occur among white, middle aged men, because of the higher numbers of white, middle aged men in the U.S. population, they do not have the highest suicide rate. A particularly concerning subgroup of youth is in the American Indian/Alaska Native adolescent population where 14-27 percent have reportedly attempted suicide [2].

Suicide is strongly associated with psychiatric illness and substance abuse disorders. People with a bipolar disorder diagnosis have a rate of suicide 25 times higher than the general population [4]. Besides previous suicide attempts, severe depressive disorders and alcohol abuse are the most strongly associated risk factors for suicide. Alcohol use and depression are linked risk factors as studies have found 45-70 percent of people with substance use disorders that die by suicide also had depression [2, 4].

Lesbian, gay, bisexual and transgender (LGBT) populations have been shown in studies to have a higher risk of suicide than the general population. U.S. death certificates do not record sexual orientation or gender identity, making it difficult to discern exact estimates of suicide in this population. A meta-analysis studying suicide attempts found 12-19 percent of LGB adults reported a suicide attempt compared with less than 5 percent of all U.S. adults [2]. The same analysis also found at least 30 percent of LGB adolescents reported suicide attempts compared with 8-10 percent of all U.S. adolescents [2]. Less research has been performed in the transgender population, but limited information shows transgendered individuals also have a high risk for suicide. In the 2009 National Transgender Discrimination Survey, 41 percent of respondents reported at least one lifetime suicide attempt [2]. Higher rates of suicide attempts may be due to stress associated with experiences of discrimination, family rejection, harassment, bullying, violence, and victimization.

Public health impact

Suicide affects adults of working age resulting in large costs to the economy from lost wages and work productivity. In the United States, the economic impact of suicide is \$34 billion per year. In addition to lost wages and work productivity, suicide attempts result in increased spending on medical care. In 2010, more than 650,000 hospital visits were related to intentional self-harm [5]. An estimated \$3 billion dollars each year is spent on direct medical costs related to unsuccessful suicide attempts [5].

Suicide also has a strong, negative impact on the social network of the suicide victim. An estimated six “survivor-victims” result from each suicide in the United States creating 5-6 million Americans who are emotionally affected by suicide. Survivor-victims tend to experience higher levels of overall grief, guilt, shock, and confusion than people who have lost loved ones to other causes.

In addition, the impact of suicide is tied to substance abuse prevention. Based on suicide data from 16 states in the National Violent Death Reporting System in 2009, 33.3 percent of suicide decedents tested positive for alcohol abuse, 23 percent for antidepressants, and 20.8 percent for opiates, including heroin and prescription pain killers [6]. Prevention of suicide could also prevent those connected to the suicide victim from turning to substance abuse to self-medicate from complex experiences of grief and guilt.

Leverage or realign resources

The ability to impact suicide – intentional self-harm – among all segments of the population will need to include use of evidence-based programming and policy. It is noteworthy that there are few evidence-based programs to impact adults, including American Indian/Alaskan Natives and Non-Hispanic Whites. A public health approach to suicide prevention identifies successful programming that produces significant, sustained reductions and focuses on identifying broader patterns of suicide and suicidal behavior throughout a group or population. This is in contrast to the clinical approach that explores the history and health conditions leading to suicide in the individual. Interventions to promote emotional health and prevent mental health problems should be chosen in the context of a strategic thinking and planning process. Taking the time to define the underlying problem that needs to be addressed and clearly define goals will help to maximize success [7].

The U.S. Surgeon General and the National Alliance for Suicide Prevention released an updated National Strategy for Suicide Prevention in 2012. The report outlines goals and objectives for actions that can be taken to prevent suicide. The report is accessible using the following link: surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/index.html The National Strategy is divided into four different interconnected sub-strategies focusing on separate aspects of suicide prevention. The sub-strategies are: 1) Healthy and Empowered Individuals, Families, and Communities 2) Clinical and Community Preventive Services 3) Treatment and Support Services and 4) Surveillance, Research and Evaluation [2].

Major protective factors against suicide include effective mental health care, being socially connected (to family, friends, community and social institutions), and possessing adequate stress coping mechanisms. Mental health care, including Cognitive Behavioral Therapy and Dialectical Behavior Therapy, can reduce suicide risk [8, 9]. It is essential to ensure the use of these evidence based mental health approaches are supported by funders (Medicaid, Medicare, Private insurance, etc.) and in policy. Connectedness between individuals, family members, community organizations, and social institutions is equally important and is a main component of the CDC focus on suicide prevention [10]. Building communities that promote the use of evidence based mental health treatment in conjunction with teaching coping skills in educational settings will enhance our ability to impact the prevalence of suicide and suicide attempts.

Lastly, a major risk factor for suicide is access to lethal means. One of the most powerful risk factors for suicide deaths is the ready availability of highly lethal methods. All U.S. studies that have compared individuals who have died by suicide with matched controls (demographically similar people who did not die by suicide) have found that a gun in the home increases the risk of suicide [11]. This is true for people of all ages, but particularly for youth. It is true both for those with psychopathology and without [11]. Limiting access to lethal means needs to be addressed in policy and promoted in programs.

Predict an individual's health and wellness and/or that of their offspring

The death of a person by suicide can have an impact on the emotional, mental and/or financial well-being of family, friends, coworkers and others. Individuals who are bereaved by suicide have a higher risk for suicidal thoughts. They may not seek help in coping with a death by suicide due to social stigma causing an already complex grief and grieving process to be increasingly difficult to overcome. People bereaved by suicide have also been found to be at a higher risk for substance use disorders.

Children exposed to suicide may be more likely to adopt health risk behaviors. In the initial Adverse Childhood Experiences Study (1998) over 13,000 recipients of health care received surveys to ascertain their exposure to abuse or household dysfunction. The survey questions included asking the respondents if they grew up with a household member who was depressed or mentally ill, and, if they grew up with a household member that attempted suicide [12]. The results of the study showed that there was a strong relationship between the breadth of exposure to abuse or household dysfunction during childhood and multiple risk factors for several of the leading causes of death in adults. Occurrence of adverse childhood experiences, such as exposure to suicide, may result in adult health problems that represent a long-term consequence of this adverse childhood experience [12].

Many more individuals attempt suicide than those who die by suicide. For each suicide death, there are more than 30 suicide attempts [2]. Suicidal behaviors affect the health of the individual who attempted suicide as well as their family members and social network. Most importantly, a previous suicide attempt could be indicative of underlying social connection issues or mental health problems and is a major risk factor for eventual death by suicide.

Data Criteria

Data availability

The National Vital Statistics System is an intergovernmental sharing of data whose relationships, standards, and procedures form the mechanism by which the National Center for Health Statistics (NCHS) collects and disseminates the Nation's official vital statistics. Vital event data are collected and maintained by the jurisdictions which have legal responsibility for registering vital events; these entities provide the data via contracts to NCHS. Vital events include births, deaths, marriages, divorces, and fetal deaths. In the United States, legal authority for the registration of these events resides individually with the 50 States, two cities (Washington, DC, and New York City), and five territories (Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands).

Vital Statistics data are available online in downloadable public use files, through pre-built tables in VitalStats, and through the ad-hoc query system CDC WONDER (Wide-ranging Online Data for Epidemiologic Research). Birth certificate data is available in WONDER for 1995-2010, and death certificate data by underlying cause of death (detailed mortality) is available for 1999-2010.

Suicide or intentional self-harm data (total numbers and rate) are provided for the total population, as well as at age intervals beginning at five years of age. The national estimate for suicide rate is based on the mechanism of death as determined by the following International Classification of Diseases, Tenth Revision (ICD-10) codes: U03, X60-X84, and Y87.0. The denominator, all persons in the population, is obtained from U.S. census data.

Data quality

Standard forms for the collection of the data and model procedures for the uniform registration of the events are developed and recommended for State use through cooperative activities of the States and NCHS. As reported in the NCHS publication U.S. Vital Statistics System, Major Activities and Developments, 1950-1995, efforts to improve the quality and usefulness of vital statistics data are ongoing. NCHS uses techniques such as testing for completeness and accuracy of data, querying incomplete or inconsistent entries on records, updating classifications, improving timeliness and usefulness of data, and keeping pace with evolving technology and changing needs for data. Work with state partners to improve the timeliness of vital event reporting is ongoing, and NCHS is working closely with National Association of Public Health Statistics and Information Systems and the Social Security Administration to modernize the processes through which vital statistics are produced in the United States, including implementation of the 2003 revised certificates.

Simplicity of indicator

The indicator is relatively simple to calculate and explain. The numerator is the total number of persons in the population whose cause of death was reported as intentional self-harm and are aged 10 and over. The denominator is the total number of people in the population aged 10 and over. Age-adjustment of the indicator, which corrects for population distributions that differ by age, adds a degree of complexity to the indicator but increases the utility for comparisons across states and to the nation.

References

- [1] National Vital Statistics System, Centers for Disease Control and Prevention Website. Available at <http://www.cdc.gov/nchs/deaths.htm> April 2013
- [2] Department of Health and Human Services & The National Action Alliance for Suicide Prevention. The 2012 National Strategy for Suicide Prevention: A report of the U.S. Surgeon General and of the National Action Alliance for Suicide Prevention. (September 2012) Available at: <http://www.surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/index.html>
- [3] Suicide Prevention Resource Center, Scope of the Problem. April 2013. Available at <http://www.sprc.org/basics/about-suicide>.
- [4] Tondo, L., Isacsson, G., & Baldessarini, R. J. (2003). Suicidal Behaviour in Bipolar Disorder: Risk and Prevention. *CNS Drugs*, 17(7), 491-511
- [5] American Foundation For Suicide Prevention Website. 2013. Available at <http://www.afsp.org/understanding-suicide/facts-and-figures>
- [6] Karch DL, Logan J, McDaniel D, Parks S, Patel N. Surveillance for violent deaths—National Violent Death Reporting System, 16 States, 2009. *MMWR Surveillance Summary* 2012; 61:1-43. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6106a1.htm?s_cid=ss6106a1_e#tab6.
- [7] Suicide Prevention Resource Center, About Suicide Prevention. April 2013. Available at <http://www.sprc.org/basics/about-suicide-prevention>
- [8] Brown G, Ten Have T, Henriques G, Xie S, Hollander J, Beck A. Cognitive Therapy for the Prevention of Suicide Attempts: A Randomized Controlled Trial. *JAMA: Journal Of The American Medical Association* [serial online]. August 3, 2005;294(5):563-570.
- [9] Linehan M, Comtois K, Lindenboim N, et al. Two-Year Randomized Controlled Trial and Follow-up of Dialectical Behavior Therapy vs Therapy by Experts for Suicidal Behaviors and Borderline Personality Disorder. *Archives Of General Psychiatry* [serial online]. July 2006;63(7):757-766.
- [10] Centers for Disease Control and Prevention. Enhanced Evaluation and Actionable Knowledge for Suicide Prevention Series: Suicide Prevention: A Public Health Issue. April 9, 2012. Available at: http://www.cdc.gov/ViolencePrevention/pdf/ASAP_Suicide_Issue2-a.pdf
- [11] Means Matter. Harvard Injury Control Research Center, Harvard School of Public Health, Boston, MA 02115. April 2013. Available at: <http://www.sprc.org/sites/sprc.org/files/library/MeansMatter.pdf>
- [12] Vincent J. Felitti, MD, FACP, Robert F. Anda, MD, MS, Dale Nordenberg, MD, David F. Williamson, MS, PhD, Alison M. Spitz, MS, MPH, Valerie Edwards, BA, Mary P. Koss, PhD, James S. Marks, MD, MPH. *Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults-The Adverse Childhood Experiences (ACE) Study*. *American Journal of Preventive Medicine*, Volume 14, Number 4 (1998). Pages 245-258.

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