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Center for Behavioral Health Statistics and Quality

CBHSQ DATA REVIEW

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Abstract

This report compares estimates of suicidality (i.e., serious thoughts of suicide, suicide plans, suicide attempts, and receipt of medical care for a suicide attempt) generated from the National Survey on Drug Use and Health (NSDUH) with estimates of similar measures acquired from other national data sources. It also describes the methodologies of the different data sources and discusses the differences in survey design and estimation that may contribute to differences among these estimates. The other data sources discussed include the National Comorbidity Survey Replication (NCS-R), the Youth Risk Behavior Survey (YRBS), the National Hospital Discharge Survey (NHDS), and the Nationwide Inpatient Sample (NIS). Substantial differences in estimates of suicidality were evident between the data sources. The 2008 NSDUH estimate of past 12-month suicidal thoughts was higher than the estimate from the NCS-R (conducted from 2001 to 2003), but no differences were seen between estimates of suicide plans or attempts in the past 12 months. Data for high school students aged 18 or older from the combined 2009-2011 YRBS surveys showed substantially higher annual average percentages of all measures of suicidality compared with combined 2008-2012 NSDUH data for respondents aged 18 or older who were enrolled in high school at the time of the survey. Estimates of suicide-related hospital stays from the NHDS and NIS were higher than estimates from NSDUH for the overall sample of adults, but this pattern was not evident in all age groups (note that statistical testing was not performed on these differences because standard errors were not available from the NHDS for certain age groups). Methodological differences across the data sources (e.g., year of data collection, sampling design, mode of data collection, and specific questions used) that could possibly cause the differences in estimates are discussed.

Measurement of Suicidal Thoughts, Behaviors, and Related Health Outcomes in the United States: Comparison of NSDUH Estimates with Other Data Sources

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Introduction

Overview of Data Sources on Suicidality

Sensitive topics such as thoughts, plans, and attempts of suicide are important public health issues, but can be difficult to measure in general population surveys because of privacy concerns. A limited number of national data sources measure suicidality (i.e., serious thoughts of suicide, suicide plans, suicide attempts, and receipt of medical care for a suicide attempt) in the general population. In 2008, the National Survey on Drug Use and Health (NSDUH) began measuring suicidality in the U.S. adult population aged 18 or older. This data review summarizes other national data sources that measured suicidality and compares their estimates with NSDUH estimates. Research shows that initial experiences of suicidal thoughts and behavior often occur during late childhood and early adolescence (Nock et al., 2013); therefore, this data review includes data sources that provide suicide measures among both adolescent and adult populations, although NSDUH estimates are only available for adults aged 18 or older. Estimates of suicidality from these data sources are compared with corresponding NSDUH estimates where appropriate.

Measures of Suicidality

Estimates of suicidality are typically determined by measuring serious thoughts of suicide, suicide plans, and suicide attempts. Measurements of health outcomes related to suicidal behavior include estimates of medical treatment received as a result of a suicide attempt, including suicide-related hospital stays.

Demographic Correlates of Interest

Identifying populations at highest risk for suicide-related behavior can aid in the design and implementation of prevention programs. For this reason, suicidality estimates in this data review are presented separately for males and females when available. Estimates are also compared separately for certain age and race/ethnicity groups when possible.

Organization of the Data Review

Population-based national surveys measuring serious thoughts of suicide and suicidal behavior are presented first in this data review. Surveys of adults are described, followed by surveys of adolescents. Data sources measuring suicide-related health outcomes are then presented, and hospitalization data are described.

National Adult Population Surveys

National adult population surveys that measure suicidality include NSDUH, the National Comorbidity Survey (NCS), the NCS follow-up (NCS-2), the NCS Replication (NCS-R), the National Longitudinal Alcohol Epidemiologic Survey (NLAES), and the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). These surveys are summarized in Table 1.

NSDUH

NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) and provides current estimates on substance use and mental illness for the U.S. population aged 12 or older. Most questions regarding mental health, including suicidality, are limited to adults aged 18 or older.

Survey Methodology. NSDUH is a nationally representative survey that uses a state-based design with an independent, multistage area probability sample within each state and the District of Columbia to produce national, state, and substate estimates. NSDUH uses audio computer-assisted self-interviewing (ACASI) administration for potentially sensitive questions, including questions measuring suicidality. Suicidality measures for adults aged 18 or older were implemented beginning in 2008, with about 46,000 adult interviews completed annually. Where multiple years have been pooled together in this report, NSDUH estimates represent average annual estimates. NSDUH sampling and weighting are discussed elsewhere (Center for Behavioral Health Statistics and Quality [CBHSQ], 2013b).

Questions Assessing Suicidality. One question assessed past 12-month suicidal thoughts:

1. At any time in the past 12 months, that is from [datefill] up to and including today, did you seriously think about trying to kill yourself?

Two additional questions assessed suicide plans and attempted suicide for respondents indicating that they had suicidal thoughts in the past 12 months:

2. During the past 12 months, did you make any plans to kill yourself?
3. During the past 12 months, did you try to kill yourself?

Subsequently, two questions assessed past 12-month medical attention for respondents indicating that they had attempted suicide in the past 12 months:

4. During the past 12 months, did you get medical attention from a doctor or other health professional as a result of an attempt to kill yourself?
5. Did you stay in a hospital overnight or longer because you tried to kill yourself?

Additional suicide questions were asked as part of a module assessing depression symptoms. However, because those questions were asked within the context of a major depressive episode (MDE) experienced by individuals who screened into the depression module, they were not used to estimate past 12-month suicidality in this data review.

NCS

The NCS was sponsored by the National Institute of Mental Health, the National Institute on Drug Abuse, and the W. T. Grant Foundation. It was first conducted in 1990-1992 and repeated in 2001-2002 (NCS-2). These two surveys measured lifetime suicide estimates and the persistence of suicidality within a cohort population, which cannot be directly compared with cross-sectional past 12-month estimates from NSDUH (Table 1). However, the replication (NCS-R) enrolled a new nationally representative cohort in 2001-2003 with expanded questions assessing the recency

Table 1. Comparison of NSDUH with National Population Surveys

Criteria	NSDUH	NCS and NCS-2[1]	NCS-R	NLAES and NESARC[1]
Years	Annually, 2008-2012	1990-1992 (NCS), with follow-up in 2001-2002 (NCS-2)	2001-2003	1991-1992 (NLAES), 2001-2002 (NESARC)
Ages	18 years or older	15-54 years at baseline	18 years or older	18 years or older
Average Sample Size	45,913	5,001	5,692	42,978
Survey Mode	CAPI; ACASI for sensitive topics	PAPI (NCS); CAPI (NCS-2)	CAPI, sensitive topics listed by letter in a self-administered booklet allowed respondents further privacy	PAPI (NLAES); CAPI (NESARC)
Setting	Household	Household	Household	Household
Available Estimates	Annual estimates of suicide ideation, plans, and attempts	Single estimates of baseline, onset, and persistence of suicide ideation, plans, gestures, and attempts[2]	Single estimates of suicide ideation, plans, and attempts[3]	Single estimates of suicide ideation (with and without attempt) and suicide attempt[4]
Reference Period	12 months	Lifetime	Lifetime (past 12-month estimates assessed among those reporting lifetime ideation)	Lifetime
Denominator	Total sample	Total sample	Total sample	Those who screened into the depression section
Question Wording: Suicidal Thoughts	At any time in the past 12 months, that is from [datefill] up to and including today, did you seriously think about trying to kill yourself?	Have you ever seriously thought about committing suicide?	Have you ever seriously thought about committing suicide? (If yes) Did this happen to you at any time in the past 12 months?	During that time when your mood was at its lowest/you enjoyed or cared the least about things, did you think about committing suicide?
Question Wording: Suicide Plan	During the past 12 months, did you make any plans to kill yourself?	Have you ever made a plan for committing suicide?	Have you ever made a plan for committing suicide?[5] (If yes) Did this happen to you at any time in the past 12 months?	Not asked
Question Wording: Attempted Suicide	During the past 12 months, did you try to kill yourself?	Have you ever attempted suicide? (Followed by questions assessing if the attempt was a gesture or actual attempt)	Have you ever attempted suicide?[5] (If yes) Did this happen to you at any time in the past 12 months?	During that time when your mood was at its lowest/you enjoyed or cared the least about things, did you attempt suicide?

ACASI = audio computer-assisted self-interviewing; CAPI = computer-assisted personal interviewing; NCS and NCS-2 = National Comorbidity Survey and Follow-up; NCS-R = National Comorbidity Survey Replication; NESARC = National Epidemiologic Survey on Alcohol and Related Conditions; NLAES = National Longitudinal Alcohol Epidemiologic Survey; NSDUH = National Survey on Drug Use and Health; PAPI = paper and pencil interviewing.

[1] Survey description is provided for information only; estimates are not presented.

[2] Borges, Angst, Nock, Ruscio, and Kessler (2008).

[3] Borges et al. (2006).

[4] Baca-Garcia et al. (2010).

[5] Respondents who did not report lifetime suicidal ideation were not asked about lifetime plans or attempts.

of lifetime suicidal thoughts and behaviors. This data review focuses on the past 12-month NCS-R estimates because they are the most comparable with NSDUH's estimates.

Survey Methodology. The NCS-R sample is based on a multistage clustered area probability sampling design representative of the U.S. household population. The full sample consisted of 9,282 respondents aged 18 or older, and the 12-month occurrence of suicide ideation, plans, and attempts was assessed in a subsample of 5,692 respondents. NCS-R sampling and weighting are discussed elsewhere (Kessler et al., 2004).

Questions Assessing Suicidality. The NCS-R assessed suicidal behavior using questions from the baseline NCS (Kessler, Borges, & Walters, 1999) about the lifetime occurrence of suicide ideation:

1. Have you ever seriously thought about committing suicide?

Respondents who indicated having serious thoughts about committing suicide were asked two additional questions:

2. Have you ever made a plan for committing suicide?
3. Have you ever attempted suicide?

NCS-R respondents who indicated lifetime ideation were then asked to report past 12-month ideation. Likewise, NCS-R respondents who indicated lifetime plans then were asked to report past 12-month plans, and those who indicated lifetime attempts were asked to report past 12-month attempts. NCS-R estimates on past 12-month ideation, plans, and attempts were published by Borges et al. (2006).

Comparison with NSDUH Estimates. Estimates of past 12-month suicidal thoughts and plans were higher for the 2008 NSDUH than for the NCS-R; however, estimates of past 12-month attempts were similar between the two surveys (Table 2). Differences between genders were consistent in the two data sources; however, NSDUH estimates for past 12-month suicide plans were higher than the NCS-R estimates for females.

Differences between the NSDUH and NCS-R estimates for suicidal thoughts and plans may be explained, to some extent, by one or more of the following:

1. Percentages of past 12-month serious thoughts of suicide and suicide plans may have increased in the general population between the time at which the NCS-R was administered (2001-2003) and the time at which NSDUH began measuring suicidality (2008).

Table 2. Serious Thoughts of Suicide and Suicidal Behavior in the Past 12 Months among Adults Aged 18 or Older, by Gender: Percentages (Standard Errors), Comparison of NSDUH and NCS-R

Suicidality, by Gender	2008 NSDUH, % (SE)[1]	2001-2003 NCS-R, % (SE)[2]
Suicidal Thoughts	3.7 (0.13)	2.6[b] (0.2)
Male	3.5 (0.19)	2.2[b] (0.2)
Female	3.9 (0.18)	3.0[b] (0.3)
Suicide Plan	1.0 (0.07)	0.7[b] (0.1)
Male	0.9 (0.10)	0.7 (0.2)
Female	1.1 (0.10)	0.8[a] (0.1)
Attempted Suicide	0.5 (0.05)	0.4 (0.1)
Male	0.4 (0.06)	0.4 (0.1)
Female	0.6 (0.07)	0.5 (0.1)

NCS-R = National Comorbidity Survey Replication; NSDUH = National Survey on Drug Use and Health; SE = standard error.

[a] The difference between this estimate and the NSDUH estimate is statistically significant at the .05 level.

[b] The difference between this estimate and the NSDUH estimate is statistically significant at the .01 level.

[1] NSDUH respondents with unknown suicidality information were excluded.

[2] Borges et al. (2006).

2. The NCS-R was conducted using computer-assisted personal interviewing (CAPI), while NSDUH utilized ACASI. The NCS-R provided some privacy by supplying a self-administered booklet in which sensitive topics could be referred to by letter; however, ACASI administration likely provides an increased sense of privacy and therefore, possibly higher self-reports.
3. The NCS-R uses the word "suicide" in its questions, whereas NSDUH uses the term "killing yourself"; NSDUH phrasing may be more easily understood in the general population.
4. The NCS-R first assessed lifetime suicidal ideation, followed by lifetime plans and lifetime attempts among those indicating lifetime ideation. Only when lifetime ideation, plans, or attempts were affirmed did the NCS-R assess past 12-month occurrence. NSDUH did not first assess lifetime suicide, but instead first assessed past 12-month suicidal ideation, followed by past 12-month suicidal plans and attempts if past 12-month suicidal ideation was reported.

Gender Differences. NSDUH estimates indicate that females were more likely than males to have past 12-month suicidal thoughts. Suicide plans and attempts were slightly more likely among women than men, but the gender differences were not statistically significant. Statistical testing was not

conducted for NCS-R gender differences due to limited sample size (Borges et al., 2006); however, patterns appeared to be similar to those found in NSDUH.

NLAES and NESARC

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) sponsored two surveys measuring suicidality among adults with depression—NLAES in 1991-1992 and NESARC in 2001-2002.

Survey Methodology. NLAES and NESARC are nationally representative of the civilian, noninstitutionalized U.S. adult population aged 18 or older. Their multistage probability samples consist of 42,862 adults who were interviewed using paper-and-pencil interviewing (PAPI) questionnaires for NLAES and 43,093 CAPI interviews for NESARC. In NLAES, all of the respondents were assessed for lifetime history of suicidal ideation and suicide attempts. In NESARC, respondents who screened into the MDE section using diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) (American Psychiatric Association, 1994) were asked two questions regarding the time when their mood was at its lowest or they enjoyed or cared the least about things:

1. Did you think about committing suicide?
2. Did you attempt suicide?

Comparability Issues with NSDUH. NLAES data were collected more than two decades ago; therefore, no comparisons were made to NSDUH. NESARC provides more recent suicidality estimates than NLAES; however, the questions were only asked within the context of MDE. Therefore, NESARC estimates of suicidality are not comparable with past 12-month NSDUH estimates, which are based on all sampled adults rather than just those who had experienced an MDE.

National Adolescent Surveys

National adolescent surveys that measure suicidality include the Youth Risk Behavior Survey (YRBS), the National Comorbidity Survey Adolescent (NCS-A), and the National Longitudinal Study of Adolescent Health (Add Health) (see Table 3).

YRBS

The YRBS is sponsored by the Centers for Disease Control and Prevention (CDC) and provides estimates of behavioral health risk factors among high school students in the United States every 2 years.

Survey Methodology. The YRBS uses a three-stage cluster sample design to produce a nationally representative sample of students in grades 9 through 12 who attend public and private schools. The survey is self-administered in classrooms during the spring semester of odd numbered years. For the 2011 national YRBS, 15,452 students in 158 schools completed usable questionnaires. For this data review, public use YRBS data files were downloaded from the survey's website (CDC, n.d., *1991-2013 High School Risk Behavior Survey Data*).

Questions Assessing Suicidality. The YRBS has four questions that assess suicidal thoughts, suicidal plans, suicide attempts, and medical treatment for a suicide attempt:

1. During the past 12 months, did you ever seriously consider attempting suicide?
2. During the past 12 months, did you make a plan about how you would attempt suicide?
3. During the past 12 months, how many times did you actually attempt suicide?
4. If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?

Comparison with NSDUH Estimates. The questions assessing suicidality in NSDUH are not asked of adolescents aged 12 to 17; however, a portion of respondents aged 18 or older reported being enrolled in high school. For comparability, NSDUH and YRBS estimates in this section, therefore, are limited to high school students aged 18 or older. NSDUH respondents are further limited to those who were interviewed during the first 6 months of the year because the YRBS is conducted during the spring semester. Combined sample sizes for these estimates were about 4,300 for the 2008-2012 NSDUHs and 4,822 for the 2009-2011 YRBS; average annual estimates are presented for YRBS in this report.

Many differences are evident between the YRBS and NSDUH, all of which make the surveys' results difficult to interpret. The small sample size of students aged 18 or older results in limited statistical power. Also, the YRBS questions may imply "self-harm" because respondents are asked if they seriously considered attempting suicide rather than "killing" themselves.

Overall, measures of suicidality were statistically significantly higher for the 2009-2011 YRBS than for the 2008-2012 NSDUH (Tables 4 to 7). Substantial differences were evident for both genders and all race/ethnicity groups, except for estimates of medical attention as a result of a suicide attempt among female and non-Hispanic white students.

Table 3. Comparison of NSDUH with National Adolescent Surveys

Criteria	NSDUH	YRBS	NCS-A	Add Health
Years	Annually, 2008-2012	Odd years from 1991-2011	2001-2004	1994-1995, with follow-up in 1996
Ages/Grades	18 years or older[1]	Grades 9-12	13-18 years	Grades 7-12 at baseline
Sample Size	4,338	From 10,904 to 16,410	10,123	13,110
Survey Mode	CAPI; ACASI for sensitive topics	Self-administered PAPI	CAPI	CAPI; ACASI for sensitive topics
Setting	Household	School	Household	Household
Available Estimates	Annual estimates of suicide ideation, plans, attempts, and medically treated attempts	Biennial (spring semester) estimates of suicide ideation, plans, attempts, and medically treated attempts[2]	Single estimates of suicide ideation, plans, and attempts; also, suicide plans and attempts among respondents who reported lifetime ideation[3]	Estimates of suicide attempts upon follow-up[4]
Reference Period	12 months	12 months	Lifetime (past 12-month estimates assessed among those reporting lifetime ideation)	12 months
Denominator	Total sample	Total sample	Total sample	Total sample
Question Wording: Suicidal Thoughts	At any time in the past 12 months, that is from [datefill] up to and including today, did you seriously think about trying to kill yourself?	During the past 12 months, did you ever seriously consider attempting suicide?	Have you ever seriously thought about committing suicide? (If yes) Did this happen to you at any time in the past 12 months?	Not asked
Question Wording: Suicide Plan	During the past 12 months, did you make any plans to kill yourself?	During the past 12 months, did you make a plan about how you would attempt suicide?	Have you ever made a plan for committing suicide?[5] (If yes) Did this happen to you at any time in the past 12 months?	Not asked
Question Wording: Attempted Suicide	During the past 12 months, did you try to kill yourself?	During the past 12 months, how many times did you actually attempt suicide?	Have you ever attempted suicide?[5] (If yes) Did this happen to you at any time in the past 12 months?	During the past 12 months, did you actually attempt suicide?
Question Wording: Medically Treated Suicide Attempt	During the past 12 months, did you get medical attention from a doctor or other health professional as a result of an attempt to kill yourself?	If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?	Not available	Not asked

ACASI = audio computer-assisted self-interviewing; Add Health = National Longitudinal Study of Adolescent Health; CAPI = computer-assisted personal interviewing; CDC = Centers for Disease Control and Prevention; NCS-A = National Comorbidity Survey Adolescent; n.d. = no date; NSDUH = National Survey on Drug Use and Health; PAPI = paper and pencil interviewing; YRBS = Youth Risk Behavior Survey.

[1] For comparison purposes, estimates are provided for respondents in the 12th grade during the first 6 months of the year.

[2] CDC (n.d.), *1991-2013 High School Risk Behavior Survey Data*.

[3] Husky et al. (2012).

[4] Borowsky, Ireland, and Resnick (2001).

[5] Respondents who did not report lifetime suicidal ideation were not asked about lifetime plans or attempts.

Table 4. Serious Thoughts of Suicide in the Past 12 Months among High School Students Aged 18 or Older, by Demographic Characteristics: Average Annual Percentages (Standard Errors), Comparison of NSDUH and YRBS

Demographic Characteristic	2008-2012 NSDUH, % (SE)[1]	2009-2011 YRBS, % (SE)[2]
Total	8.3 (0.56)	12.2[b] (0.56)
Gender		
Male	6.6 (0.68)	9.7[b] (0.78)
Female	10.5 (0.94)	15.3[b] (0.96)
Race/Ethnicity		
Non-Hispanic White	8.6 (0.70)	11.3[a] (0.85)
Non-Hispanic Black	7.4 (1.21)	10.9[a] (1.04)
Hispanic	7.3 (1.58)	15.0[b] (1.17)

NSDUH = National Survey on Drug Use and Health; SE = standard error; YRBS = Youth Risk Behavior Survey.

[a] The difference between this estimate and the NSDUH estimate is statistically significant at the .05 level.

[b] The difference between this estimate and the NSDUH estimate is statistically significant at the .01 level.

[1] For comparison purposes, NSDUH estimates are provided for respondents aged 18 or older attending high school full time who were interviewed during January through June each year. Respondents with unknown suicide information were excluded.

[2] CDC (2014).

Table 5. Planned Suicide in the Past 12 Months among High School Students Aged 18 or Older, by Demographic Characteristics: Average Annual Percentages (Standard Errors), Comparison of NSDUH and YRBS

Demographic Characteristic	2008-2012 NSDUH, % (SE)[1]	2009-2011 YRBS, % (SE)[2]
Total	3.3 (0.36)	9.7[b] (0.50)
Gender		
Male	2.5 (0.40)	8.5[b] (0.69)
Female	4.3 (0.63)	11.1[b] (0.73)
Race/Ethnicity		
Non-Hispanic White	3.1 (0.39)	8.5[b] (0.66)
Non-Hispanic Black	4.2 (1.00)	8.8[b] (0.98)
Hispanic	2.4 (0.90)	12.8[b] (0.97)

NSDUH = National Survey on Drug Use and Health; SE = standard error; YRBS = Youth Risk Behavior Survey.

[a] The difference between this estimate and the NSDUH estimate is statistically significant at the .05 level.

[b] The difference between this estimate and the NSDUH estimate is statistically significant at the .01 level.

[1] For comparison purposes, NSDUH estimates are provided for respondents aged 18 or older attending high school full time who were interviewed during January through June each year. Respondents with unknown suicide information were excluded.

[2] CDC (2014).

Table 6. Attempted Suicide in the Past 12 Months among High School Students Aged 18 or Older, by Demographic Characteristics: Average Annual Percentages (Standard Errors), Comparison of NSDUH and YRBS

Demographic Characteristic	2008-2012 NSDUH, % (SE)[1]	2009-2011 YRBS, % (SE)[2]
Total	1.8 (0.24)	5.3[b] (0.39)
Gender		
Male	1.6 (0.31)	4.5[b] (0.56)
Female	2.0 (0.37)	6.3[b] (0.60)
Race/Ethnicity		
Non-Hispanic White	1.9 (0.33)	3.6[b] (0.45)
Non-Hispanic Black	2.0 (0.56)	6.9[b] (1.27)
Hispanic	0.4 (0.23)	9.1[b] (1.12)

NSDUH = National Survey on Drug Use and Health; SE = standard error; YRBS = Youth Risk Behavior Survey.

[a] The difference between this estimate and the NSDUH estimate is statistically significant at the .05 level.

[b] The difference between this estimate and the NSDUH estimate is statistically significant at the .01 level.

[1] For comparison purposes, NSDUH estimates are provided for respondents aged 18 or older attending high school full time who were interviewed during January through June each year. Respondents with unknown suicide information were excluded.

[2] CDC (2014).

Table 7. Receipt of Medical Attention as a Result of a Suicide Attempt in the Past 12 Months among High School Students Aged 18 or Older, by Demographic Characteristics: Average Annual Percentages (Standard Errors), Comparison of NSDUH and YRBS

Demographic Characteristic	2008-2012 NSDUH, % (SE)[1]	2009-2011 YRBS, % (SE)[2]
Total	0.8 (0.16)	1.9[b] (0.27)
Gender		
Male	0.5 (0.18)	1.9[b] (0.39)
Female	1.1 (0.29)	1.9 (0.35)
Race/Ethnicity		
Non-Hispanic White	0.8 (0.21)	1.2 (0.28)
Non-Hispanic Black	1.0 (0.38)	— (—)[c]
Hispanic	0.2 (0.17)	3.2[b] (0.79)

NSDUH = National Survey on Drug Use and Health; SE = standard error; YRBS = Youth Risk Behavior Survey.

[a] The difference between this estimate and the NSDUH estimate is statistically significant at the .05 level.

[b] The difference between this estimate and the NSDUH estimate is statistically significant at the .01 level.

[c] Relative standard error (RSE) > 30; estimate suppressed.

[1] For comparison purposes, NSDUH estimates are provided for respondents aged 18 or older attending high school full time who were interviewed during January through June each year. Respondents with unknown suicide information were excluded.

[2] CDC (2014).

Gender Differences. YRBS average annual estimates of past 12-month suicidal thoughts, plans, and attempts were higher than NSDUH average annual estimates for both male and female students. Male students were more likely to report medical attention as a result of a suicide attempt in the YRBS than in NSDUH; however, the difference between the surveys was not significant for female students.

YRBS estimates showed higher average annual percentages of past 12-month suicidal thoughts, plans, and attempts for female students compared with male students. Estimates of suicidal thoughts and plans were also higher among females than males in NSDUH; however, the difference in the estimates of suicide attempts between genders was not significant. Receipt of medical attention as a result of a suicide attempt in the past 12 months was similar for male and female students in both the YRBS and NSDUH.

Race/Ethnicity Differences. YRBS average annual estimates of past 12-month suicidal thoughts, plans, and attempts were higher than NSDUH average annual estimates for all race/ethnicity groups. Hispanic students were more likely to report medical attention as a result of a suicide attempt in the YRBS than in NSDUH; however, the difference between the surveys was not significant for non-Hispanic white students. The YRBS estimate of receipt of medical attention as a result of a suicide attempt for non-Hispanic black students was suppressed because of low statistical precision.

YRBS estimates showed higher average annual percentages of past 12-month suicidal thoughts and plans for Hispanic students than for non-Hispanic white students and non-Hispanic black students, but NSDUH showed no racial/ethnic differences for suicidal thoughts and plans. For estimates of past 12-month suicide attempts and related medical attention, YRBS showed higher percentages among Hispanic students than among non-Hispanic white students; however, NSDUH estimates showed the opposite pattern.

Age Differences by Gender. The average annual percentage of past 12-month suicidal thoughts was lower among older high school students than among younger high school students of both genders in the YRBS and also decreased with age among young adults (ages 18 to 25) of both genders in NSDUH (Table 8). Among female students, YRBS estimates were 20.2 percent for 15 year olds and 15.3 percent for those aged 18 or older. Statistical testing was not performed because comparing multiple age groups with a single age trend analysis does not identify where the significant differences lie; however, decreasing estimates with increasing age are evident in Table 8. NSDUH estimates were 11.0 percent among female 18 year olds and 6.1 percent among female 24 year olds.

For both YRBS and NSDUH, the average annual percentage of past 12-month suicide plans was lower among older females than among younger females; such a pattern was not evident among males. Among female high school students, YRBS estimates were 16.0 percent for 15 year olds and 11.1 percent for those aged 18 or older, whereas NSDUH estimates were 4.5 and 1.6 percent for 18 and 24 year olds, respectively.

In YRBS, average annual estimates of past 12-month attempted suicide decreased with increasing age for female high school students, but not for male high school students. In NSDUH, young adults of both genders showed a decreasing percentage of attempted suicide with increasing age. Among female high school students, YRBS estimates were 10.8 percent for 15 year olds and 6.3 percent for those aged 18 or older.

The average annual percentage of medical attention as a result of a suicide attempt in the past 12 months was lower among older ages than among younger ages for females, but not for males in the YRBS and NSDUH. Among female students, YRBS estimates were 3.1 percent for 15 year olds and 1.9 percent for those aged 18 or older, while NSDUH estimates were 1.2 and 0.4 percent for 18 and 24 year olds, respectively.

Historically, the YRBS has also yielded higher estimates of substance use behavior compared with NSDUH estimates (CBHSQ, 2013a). The reasons for this difference are unclear, but the environment in which the surveys are taken may have some impact. The YRBS is administered in schools, whereas NSDUH is administered in the adolescent's home. In the school environment, perceptions of risky behaviors may be influenced by the presence of classmates, which could lead to overreporting. Additionally, the YRBS employs passive parental consent in most schools. This process allows parents to opt their student out if they wish, but consent is assumed if no parental response is obtained. In contrast, parents are often the first point of contact during the administration of NSDUH. If a family member has a behavioral or emotional problem that may make it difficult or stressful for them to participate in NSDUH, household contacts may refuse on their behalf. It is not known how often this might happen for 18-year-old high school students, but it could affect NSDUH estimates of suicidality for this report.

Table 8. Serious Thoughts of Suicide, Planned Suicide, and Attempted Suicide in the Past 12 Months among Young Individuals, by Gender and Age: Average Annual Percentages (Standard Errors), Comparison of NSDUH and YRBS

Survey, by Demographics	Suicidal Thoughts, % (SE)	Suicide Plan, % (SE)	Suicide Attempt, % (SE)	Treated Medically for a Suicide Attempt, % (SE)
MALE				
2009-2011 YRBS[1]				
Aged 15	12.1 (0.65)	9.8 (0.64)	5.1 (0.49)	1.8 (0.27)
Aged 16	10.7 (0.80)	9.6 (0.76)	5.0 (0.54)	1.6 (0.24)
Aged 17	13.2 (0.83)	10.6 (0.78)	5.5 (0.52)	1.5 (0.28)
Aged 18 or Older	9.7 (0.78)	8.5 (0.69)	4.5 (0.56)	1.9 (0.39)
2008-2012 NSDUH[2]				
Aged 18	6.6 (0.54)	2.2 (0.30)	1.7 (0.27)	0.7 (0.19)
Aged 19	6.4 (0.54)	2.1 (0.29)	1.3 (0.24)	0.6 (0.18)
Aged 20	6.4 (0.59)	2.0 (0.29)	0.9 (0.19)	0.4 (0.14)
Aged 21	5.6 (0.51)	1.4 (0.25)	0.8 (0.19)	0.3 (0.12)
Aged 22	4.7 (0.48)	1.3 (0.25)	0.6 (0.18)	0.4 (0.16)
Aged 23	4.8 (0.49)	1.5 (0.29)	0.8 (0.21)	0.2 (0.08)
Aged 24	4.8 (0.51)	1.6 (0.35)	0.8 (0.20)	0.3 (0.09)
Aged 25	4.7 (0.47)	1.6 (0.33)	0.7 (0.21)	0.4 (0.18)
FEMALE				
2009-2011 YRBS[1]				
Aged 15	20.2 (0.91)	16.0 (0.77)	10.8 (0.78)	3.1 (0.34)
Aged 16	19.5 (0.86)	15.6 (0.68)	9.9 (0.61)	2.8 (0.34)
Aged 17	16.2 (0.65)	11.6 (0.59)	7.3 (0.49)	1.9 (0.30)
Aged 18 or Older	15.3 (0.96)	11.1 (0.73)	6.3 (0.60)	1.9 (0.35)
2008-2012 NSDUH[2]				
Aged 18	11.0 (0.65)	4.5 (0.46)	2.7 (0.32)	1.2 (0.21)
Aged 19	9.7 (0.67)	3.8 (0.48)	2.4 (0.36)	0.8 (0.23)
Aged 20	8.0 (0.60)	2.3 (0.33)	1.7 (0.29)	0.7 (0.17)
Aged 21	7.3 (0.55)	2.2 (0.30)	1.4 (0.26)	0.6 (0.19)
Aged 22	7.7 (0.61)	2.2 (0.34)	1.0 (0.21)	0.5 (0.13)
Aged 23	6.4 (0.50)	1.8 (0.28)	1.3 (0.26)	0.6 (0.17)
Aged 24	6.1 (0.52)	1.6 (0.26)	0.7 (0.14)	0.4 (0.12)
Aged 25	5.5 (0.56)	1.6 (0.38)	1.0 (0.37)	0.6 (0.35)

CDC = Centers for Disease Control and Prevention; NSDUH = National Survey on Drug Use and Health; SE = standard error; YRBS = Youth Risk Behavior Survey.

[1] CDC (2014).

[2] For comparison purposes, NSDUH estimates are provided for respondents who were interviewed during January through June each year. Respondents with unknown suicide information were excluded.

NCS-A

Adolescents aged 13 to 18 years were recruited in 2001-2004 for the NCS-A, in conjunction with the NCS-R, to create a nationally representative sample of adolescents.

Survey Methodology. The NCS-A used a dual-frame sample composed of 904 adolescents from NCS-R households and 9,244 adolescents in a school sample from the same counties selected for the NCS-R. CAPI was used in a household setting for adolescents drawn from both sampling frames to assess lifetime suicidal thoughts (Kessler et al., 2009). Respondents who indicated lifetime ideation were asked to report past 12-month ideation, lifetime plans, and lifetime attempts. Those respondents who indicated lifetime plans or attempts were then asked about these experiences in the past 12 months.

Comparability Issues with NSDUH. As with the NCS-R, the NCS-A included an assessment of lifetime suicide and, once affirmed, then assessed past 12-month suicide (estimates presented in Husky et al., 2012). Comparisons of past 12-month suicidality estimates could be made by limiting the NCS-A and NSDUH samples to respondents aged 18 years old. However, such analyses were not pursued for this data review because the NCS-A sample size would be small.

Add Health

Add Health is a longitudinal survey of adolescents who were in grades 7 through 12 in 1994 to 1995. A follow-up survey in 1996 measured 1-year incidence of suicide attempts.

Survey Methodology. After completion of an in-school survey in 1994-1995, a total of 20,745 students were asked to participate in an in-home survey in 1995. In 1996, the same adolescents participated in a second in-home survey. The in-home surveys were conducted using ACASI for sensitive topics, including a question regarding past 12-month suicide attempts. The final sample size for those completing both in-home interviews was 13,110.

Comparability Issues with NSDUH. Estimates were published from Add Health for past 12-month suicide attempts upon follow-up. Comparisons with NSDUH would involve limiting Add Health data to respondents aged 18 or older, and such analyses were not pursued because the Add Health sample size would be small. Other concerns include the large time gap between the 1996 Add Health follow-up and the 2008 NSDUH and the longitudinal nature of Add Health. Add Health respondents who died after a suicide attempt in the past year could give no information on their past year suicidality during follow-up interviews, whereas NSDUH is a cross-sectional survey and does not follow respondents over time. For these reasons, Add Health estimates were not compared with NSDUH estimates in this data review.

Hospital Discharge Data

National hospital discharge data are available from the Nationwide Inpatient Sample (NIS) and the National Hospital Discharge Survey (NHDS). Both data sources use International Classification of Diseases, 9th edition, Clinical Modification (ICD-9-CM) external cause-of-injury codes (E-codes), which can be used to identify hospital discharges related to suicide and intentional self-inflicted injury. These data sources are summarized in Table 9.

NIS

The NIS is sponsored by the Agency for Healthcare Research and Quality (AHRQ) and is used to identify, track, and analyze national trends in inpatient acute care hospital utilization, access, charges, quality, and outcomes.

Methodology. From 1997 to 2011, hospital discharge abstract information was collected on approximately 8 million inpatient stays from about 1,000 hospitals. The 2011 NIS used a stratified probability sample that represented 97 percent of the discharges from nonfederal, short-term hospitals, excluding hospital units of institutions. Information on all discharges from sampled hospitals was collected, and ICD-9-CM diagnosis codes were gathered for each discharge (including stays of less than 1 day). The NIS estimates in this data review take into account all listed diagnoses; up to 15 diagnoses could be listed per discharge in the years prior to 2010, after which the maximum was raised to 25. Most diagnosis codes related to suicide are supplemental E-codes, which are not allowed to be documented as a primary diagnosis. Another code—V62.84: Suicidal ideation—is typically used as a supplemental code but may be documented as a primary diagnosis. Data can be purchased at http://www.hcup-us.ahrq.gov/nisoverview.jsp (AHRQ, 2010).

NHDS

The NHDS was sponsored by the National Center for Health Statistics (NCHS) from 1965 to 2010 to provide information on the characteristics of inpatients discharged from hospitals in the United States. A similar data source is now part of a larger data collection effort known as the National Hospital Care Survey (CDC, 2012).

Table 9. Comparison of NSDUH with National Health Care Data Sources

Criteria	NSDUH	NIS	NHDS
Years	Annually, 2008-2012	1997-2011	Annually, 2007-2010
Ages	18 years or older	All ages	All ages
Approximate Annual Sample Size	45,913 adults	8 million inpatient stays	Approximately 270,000 stays
Data Collection Sites	N/A	1,045 hospitals in 2011 (number of participating states rose from 22 in 1997 to 46 in 2011)	239-500 nonfederal short-stay hospitals with six or more beds
Available Estimates	Annual estimates of adults treated medically for suicide attempts and adults with a suicide-related hospital stay in the past 12 months	Principal or all-listed diagnoses for hospital discharges[1]	First-listed or all-listed diagnoses for hospital discharges[2]
Question Wording/ Clinical Definition	During the past 12 months, did you get medical attention from a doctor or other health professional as a result of an attempt to kill yourself? (If yes) Did you stay in a hospital overnight or longer because you tried to kill yourself?	Clinical Classification Code 662 Suicide and intentional self-inflicted injury (based on ICD-9-CM codes)	ICD-9-CM codes

AHRQ = Agency for Healthcare Research and Quality; CDC = Centers for Disease Control and Prevention; ICD-9-CM = International Classification of Diseases, 9th edition, Clinical Modification; N/A = not available; n.d. = no date; NHDS = National Hospital Discharge Survey; NIS = Nationwide Inpatient Sample; NSDUH = National Survey on Drug Use and Health.

[1] AHRQ (2010).

[2] CDC (2011b).

Methodology. Hospital discharge abstract information was collected on about 270,000 discharges from nonfederal short-stay hospitals with six or more beds. Initially, about 500 hospitals were included in the sample; however, from 2008 to 2010, the number of hospitals was reduced to 239 (CDC, 2011a). A stratified sample design was used to select hospitals; larger hospitals were selected with certainty, and the remainder were selected with probability proportional to their annual number of discharges (Dennison & Pokras, 2000). A random sample of discharges was then selected from each hospital, and ICD-9-CM diagnosis codes were collected for each discharge (including stays of less than 1 day). Up to 7 diagnoses could be listed per discharge through 2009, and in 2010 the maximum was raised to 15 diagnoses. For this data review, public use NHDS data files were downloaded from the survey's web page (CDC, 2011b).

Comparison of NSDUH, NIS, and NHDS Estimates

Table 10 presents estimates of suicide-related hospital stays for adults aged 18 or older from the 2010 NIS and the 2010 NHDS. NSDUH 2008 to 2012 data were pooled for comparison in order to produce more statistically reliable average annual estimates. The overall estimate of adults with past 12-month suicide-related hospital stays was lower for NSDUH than for the NIS and NHDS; however, statistical testing was not performed because information needed to calculate NHDS standard errors was unavailable for most demographic groups in Table 10.

Four explanations are possible for the differences between NSDUH, NIS, and NHDS:

1. The NIS and NHDS count the number of discharges; therefore, an adult with more than one suicide-related hospital stay in a given year would be counted twice. NSDUH produces counts at the person level, which eliminates the possibility of counting the same individual twice.
2. Intentional self-inflicted injuries would not necessarily be reported as suicide attempts in NSDUH if the respondent intended to injure but not kill himself or herself. However, the NIS and NHDS include ICD-9-CM codes for intentional self-inflicted injury in hospital stay estimates for which the intent of the patient is not recorded.
3. NSDUH only asks about hospital stays that are overnight or longer, but the NIS and NHDS include zero-night stays.
4. The NIS and NHDS include a small number of visits (less than 1 percent for the NIS) for which the

Table 10. Average Annual Number of Adults Hospitalized Overnight or Longer after a Suicide Attempt and Number of Suicide-Related Hospital Stays among Adults Aged 18 or Older, by Age Group: Numbers in Thousands (Standard Errors) and Number per 100,000 U.S. Population, Comparison of NSDUH, NIS, and NHDS

Demographic Characteristic	2008-2012 NSDUH[1]		2010 NIS[2,3]	2010 NHDS[2,4]	
	Average Annual Number of Adults Hospitalized Overnight or Longer (SE)	Average Annual Rate per 100,000 U.S. Population[5]	Number of Hospital Stays (SE)[6]	Number of Hospital Stays (SE)[7]	Rate per 100,000 U.S. Population[5]
Total	490,000 (35,000)	200	584,788 (30,536)	563,515 (—)	241.6
Aged 18 to 29	139,000 (11,000)	300	151,076 (8,624)	154,475 (—)	298.2
Aged 30 to 49	176,000 (19,000)	200	273,372 (14,890)	258,751 (—)	311.8
Aged 50 to 64	126,000 (25,000)	200	126,461 (6,377)	116,017 (—)	200.2
Aged 65 or Older	49,000 (14,000)	100	33,879 (1,642)	34,272 (6,667)	84.5
Male	211,000 (22,000)	200	289,074 (15,691)	279,567 (—)	246.3
Aged 18 to 29	63,000 (7,000)	200	71,541 (4,282)	82,409 (—)	310.3
Aged 30 to 49	75,000 (14,000)	200	135,535 (7,766)	122,369 (—)	296.0
Aged 50 to 64	51,000 (14,000)	200	65,818 (3,512)	60,591 (—)	215.5
Aged 65 or Older	22,000 (9,000)	100	16,179 (774)	14,198 (—)	81.2
Female	279,000 (28,000)	200	295,504 (15,353)	283,948 (—)	237.1
Aged 18 to 29	76,000 (8,000)	300	79,396 (4,456)	72,066 (—)	290.6
Aged 30 to 49	101,000 (14,000)	200	137,782 (7,473)	136,382 (—)	327.5
Aged 50 to 64	75,000 (20,000)	300	60,637 (3,062)	55,426 (—)	185.8
Aged 65 or Older	27,000 (11,000)	100	17,689 (939)	20,074 (—)	87.1

AHRQ = Agency for Healthcare Research and Quality; CDC = Centers for Disease Control and Prevention; ICD-9-CM = International Classification of Diseases, 9th revision, Clinical Modification; n.d. = no date; NHDS = National Hospital Discharge Survey; NIS =Nationwide Inpatient Sample; NSDUH = National Survey on Drug Use and Health; SE = standard error.

[1] NSDUH respondents who attempted suicide in the past 12 months were asked if they had been treated medically as a result of a suicide attempt, and subsequently those answering "yes" were asked if they had stayed in the hospital overnight or longer because of a suicide attempt. Respondents with unknown suicide information were excluded. The number per 100,000 U.S. population estimate was rounded to the nearest hundred for disclosure reasons.

[2] The NIS and NHDS provide estimates of hospital discharges related to suicide and intentional self-inflicted injury, including the following all-listed diagnoses' ICD-9-CM codes: E950.0, E950.1, E950.2, E950.3, E950.4, E950.5, E950.6, E950.7, E950.8, E950.9, E951.0, E951.1, E951.8, E952.0, E952.1, E952.8, E952.9, E953.0, E953.1, E953.8, E953.9, E954, E955.0, E955.1, E955.2, E955.3, E955.4, E955.5, E955.6, E955.7, E955.9, E956, E957.0, E957.1, E957.2, E957.9, E958.0, E958.1, E958.2, E958.3, E958.4, E958.5, E958.6, E958.7, E958.8, E958.9, E959, and V62.84.

[3] AHRQ (2010).

[4] CDC (n.d.), *National Hospital Discharge Survey*.

[5] Rate calculations were performed in the customary manner for each dataset; methods may vary.

[6] Gender was missing in a small number of NIS records; therefore, estimates by gender do not sum to the total.

[7] Primary sampling unit and strata information are not available in the NHDS public use file, and information needed to calculate SEs using parameter values for generalized variance curves were only available for certain demographic groups (most of which could not be matched to groups in Table 10).

primary diagnosis was suicidal ideation (V62.84). Such visits may not be included in NSDUH because only respondents who reported an attempt were asked if they were hospitalized.

Patterns in suicide-related hospital stays did not appear to be consistent across age groups because the NSDUH estimates were lower for males under age 65 and for females under age 50 compared with the NHDS and NIS estimates. NIS estimates were frequently more similar to the NHDS estimates than to NSDUH estimates. The similarities between the NIS and NHDS estimates may be due to the fact that they are both hospital-encounter data collection efforts.

Patterns by Age and Gender. NSDUH estimates indicate that past 12-month suicide-related hospital stays were more common among females than males, but the NIS and NHDS data did not show this same pattern. Age patterns were similar for the NHDS, NIS, and NSDUH, with estimates being highest for adults aged 30 to 49 and lowest for adults aged 65 or older.

Time Trends. The number of suicide-related hospital stays increased from 2007 to 2011 for the NIS and from 2006 to 2010 for the NHDS (Table 11). NSDUH's estimates of adults hospitalized overnight or longer in the past 12 months remained stable from 2008 to 2012. Data collection for both the NIS and NHDS changed in 2010 to include a larger maximum number of diagnosis codes, which could cause inflated estimates. This change did not appear to affect the NIS because its estimates were stable from 2009 to 2010.

Table 11. Number of Adults Hospitalized Overnight or Longer after a Suicide Attempt and Number of Suicide-Related Hospital Stays among Adults Aged 18 or Older, by Year: Numbers in Thousands (Standard Errors) and Number per 100,000 U.S. Population, Comparison of NSDUH, NIS, and NHDS

Year	NSDUH[1]		NIS[2,3]	NHDS[2,4]	
	Number of Adults Hospitalized Overnight or Longer (SE)	Rate per 100,000 U.S. Population[5]	Number of Hospital Stays[6]	Number of Hospital Stays[7]	Rate per 100,000 U.S. Population[5]
2006	N/A	N/A	N/A	222,535	99.1
2007	N/A	N/A	409,211	324,805	143.4
2008	501,000 (89,000)	200	503,024	444,933	194.3
2009	437,000 (63,000)	200	588,961	480,893	208.0
2010	574,000 (95,000)	300	584,788	563,515	241.6
2011	442,000 (83,000)	200	633,462	N/A	N/A
2012	500,000 (64,000)	200	N/A	N/A	N/A

AHRQ = Agency for Healthcare Research and Quality; CDC = Centers for Disease Control and Prevention; ICD-9 = International Classification of Diseases, 9th revision; N/A = not available; n.d. = no date; NHDS = National Hospital Discharge Survey; NIS = Nationwide Inpatient Sample; NSDUH = National Survey on Drug Use and Health; SE = standard error.

[1] NSDUH respondents who attempted suicide in the past 12 months were asked if they had been treated medically as a result of a suicide attempt, and subsequently those answering "yes" were asked if they had stayed in the hospital overnight or longer because of a suicide attempt. Respondents with unknown suicide information were excluded. The number per 100,000 U.S. population estimate was rounded to the nearest hundred for disclosure reasons.

[2] The NIS and NHDS provide estimates of hospital discharges related to suicide and intentional self-inflicted injury, including the following all-listed diagnoses' ICD-9 codes: E950.0, E950.1, E950.2, E950.3, E950.4, E950.5, E950.6, E950.7, E950.8, E950.9, E951.0, E951.1, E951.8, E952.0, E952.1, E952.8, E952.9, E953.0, E953.1, E953.8, E953.9, E954, E955.0, E955.1, E955.2, E955.3, E955.4, E955.5, E955.6, E955.7, E955.9, E956, E957.0, E957.1, E957.2, E957.9, E958.0, E958.1, E958.2, E958.3, E958.4, E958.5, E958.6, E958.7, E958.8, E958.9, E959, and V62.84.

[3] AHRQ (2010).

[4] CDC (n.d.), *National Hospital Discharge Survey*.

[5] Rate calculations were performed in the customary manner for each dataset; methods may vary.

[6] SEs and rates are not available for the NIS because the estimated number of discharges was aggregated across populations.

[7] Primary sampling unit and strata information are not available in the NHDS public use file; therefore, SEs can only be calculated for groups for which parameter values for generalized variance curves are available.

Conclusions

Various methods are used to gather information on suicidality in the United States. Population surveys are used to assess serious thoughts of suicide, suicide plans, and suicide attempts. Medical attention related to suicide attempts is measured using both surveys and hospital care data.

Among adults, estimates of past 12-month serious suicidal thoughts and plans were higher for NSDUH compared with the NCS-R—surveys that are both nationally representative of the U.S. adult population. This may be due to the time difference in the surveys. The NCS-R was conducted in 2001-2003, and the percentages of suicidal thoughts and plans may have increased in the population by 2008, which was when NSDUH began measuring suicidality. Estimates of suicide attempts were slightly higher in the 2008 NSDUH compared with the NCS-R; however, the differences were not statistically significant. Also discussed were the 1991-1992 NLAES, which did not have recent estimates, and the 2001-2002 NESARC, which only measured suicidality within the context of MDE. Neither is comparable with NSDUH.

Several data sources measured suicidality among adolescents; however, the YRBS is the only source of regularly collected data for this population. Because NSDUH only assessed suicidality among adult respondents aged 18 or older, only a small subgroup was common between YRBS and NSDUH (i.e., high school students aged 18 or older). Findings indicated that YRBS consistently yielded higher annual average estimates of suicidality compared with NSDUH for this population. Question wording and survey setting likely have some impact on estimates, but less apparent reasons may partially account for the differences.

Suicide-related hospitalizations are measured in NSDUH and in two hospital care data sources—the NIS and the NHDS. The overall NSDUH estimate was lower than those for the NIS and the NHDS, but this difference was not consistent for older age groups. The difference in younger age groups may be due to differences in sample coverage because NSDUH is a household survey and cannot measure hospitalizations of institutionalized individuals. The number of hospitalizations increased over time for the NHDS and NIS; however, NSDUH's estimates did not show increases in suicide-related hospitalizations from 2008 to 2012.

Although the magnitude of estimates between surveys varied, males were consistently less likely to report serious thoughts of suicide. Suicide-related behaviors were significantly more likely among females for the YRBS, although not for other population surveys. NSDUH estimates showed that females were involved in more suicide-related hospitalizations than males, and hospital care data sources showed similar estimates for both genders.

It is important to examine different measures of suicidality because measuring suicide-related behaviors in surveys may serve to identify different at-risk populations than data sources measuring hospitalizations. Relying on one measure may not be sufficient to inform development and implementation of intervention programs needed to address increasing rates of suicide in the United States. Goal 11 of the 2012 National Strategy for Suicide Prevention states: "Increase the timeliness and usefulness of national surveillance systems relevant to suicide prevention and improve the ability to collect, analyze, and use this information for action" (U.S. Department of Health and Human Services Office of the Surgeon General & National Action Alliance for Suicide Prevention, 2012, p. 66). Meeting this goal requires a clear understanding of the characteristics, strengths, and limitations of each of these data systems. This *CBHSQ Data Review* addresses this goal by comparing various national estimates of suicidality with NSDUH estimates. NSDUH will continue to provide annual population surveillance for suicide behavior among adults, enhancing the suicide prevention field's capacity to design and implement effective suicide prevention strategies.

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The Substance Abuse and Mental Health Services Administration (SAMHSA) is the agency within the U.S. Department of Health and Human Services that leads public health efforts to advance the behavioral health of the nation. SAMHSA's mission is to reduce the impact of substance abuse and mental illness on America's communities.

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