Comparison of Estimates for Lifetime Depression Using the National Survey on Drug Use and Health (NSDUH) and Behavioral Risk Factor Surveillance System (BRFSS)

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Abstract

In 2011, both the Behavioral Risk Factor Surveillance System (BRFSS) and the National Survey on Drug Use and Health (NSDUH) measured lifetime history of diagnosed depression among adults 18 or older. The NSDUH, an annual survey of the U.S. civilian, noninstitutionalized population aged 12 or older, is a major source of substance use and mental illness data. The BRFSS is an annual state-based telephone survey of the civilian, noninstitutionalized adult population aged 18 or older and collects data on health risk behaviors. This paper compares estimates from these two sources and explores how survey methodology influenced the measures. Differences in data collection features including questionnaire and sample design were examined as potential sources of differences in estimates. Based on the review of the survey methods, the lifetime depression estimates were deemed comparable and estimates were computed.

Key Words: survey methodology, survey mode, questionnaire design, lifetime depression, SUDAAN

1. Introduction

The paper compares national estimates of self-reported lifetime depression diagnosis from the 2011 National Survey on Drug Use and Health (NSDUH) with estimates from the 2011 Behavioral Risk Factor Surveillance System (BRFSS). This comparison was of interest because, starting in 2011, the BRFSS survey question for self-reported lifetime diagnosed depression was placed in the core BFRSS survey, thus making this measure available to calculate national estimates. Previously, this item was in a separate module of the survey and only states that selected to participate in the module would collect data for this mental health measure. The differences between BRFSS and NSDUH methodology in terms of the questionnaire design, specifically the wording and placement of this mental health measure within the two surveys, are discussed. Two studies (Hedden et al., 2012; Pemberton, et al., 2013) summarized the comparability of mental health measures between many national data sources, including NSDUH and BRFSS. This paper expands on that discussion by directly comparing the self-reported lifetime depression measure from the two surveys for the 2011 surveys.

2. Data Sources

Conducted annually, the National Survey on Drug Use and Health (NSDUH) provides information on the prevalence, patterns, and consequences of alcohol, tobacco, and illegal

drug use and abuse among all U.S. civilian, non-institutionalized residents of the 50 States and the District of Columbia, aged 12 or older. In the 2011 NSDUH, this population included residents of non-institutional group quarters (e.g., shelters, rooming houses, dormitories, and group homes) and civilians residing on military bases. As it has since 1999, the 2011 implementation utilized a 50-State, multistage cluster design that enables the Substance Abuse and Mental Health Services Administration to provide representative estimates for each State and the District of Columbia. More information regarding the 2011 NSDUH is available in the Summary of National Findings report (SAMHSA, 2012).

The BRFSS is a state-based telephone survey sponsored by the Centers for Disease Control and Prevention (CDC). Health data is collected for non-institutionalized adult civilians aged 18 or older, using multi-stage sampling and random-digit dialing. The core questionnaire is administered in all 50 states and D.C. using a computer-assisted telephone interviewing (CATI) system. Each state has the option of including additional modules on various topics. More information regarding the 2011 BRFSS is available in the survey and data documentation (CDC, 2011). It should be noted that in 2011, the cellular telephone-only households were added to the sample. For more details about the methodological changes introduced in 2011 and their impact on BRFSS prevalence estimates, see CDC (2012).

Table 1 presents a brief comparison of the methodologies of the NSDUH and BRFSS.

Table 1. Comparison of Methodologies between NSDUH and BRFSS

	NSDUH	**BRFSS**
Purpose	To provide current data on substance use and mental illness	To collect uniform state-based data on preventive health practices and risk behaviors
Sample Design & Target Population	Household, multistage, state-based probability sample of the U.S. civilian, non-institutionalized population aged 12 years old or older	Household, multistage, state-based random digit dialing sample of U.S. civilian, non-institutionalized adults aged 18 years old or older. Landline and cell phones samples included. Adolescents are excluded.
Mode	CAPI; ACASI for sensitive topics	CATI
Selected Measures Included	Specific health conditions, General rating of health, Health care utilization	Specific health conditions General rating of health
Weighting (post-stratification step)	Post-stratification by age, race, gender, and Hispanicity.	Raking variables include age, gender, race, ethnicity, education, marital status, region, telephone source, renter/owner status.

ACASI = audio computer-assisted self-interviewing; BRFSS = Behavioral Risk Factor Surveillance System; CAPI = computer-assisted personal interviewing; CATI = computer-assisted telephone interviewing; NSDUH = National Survey on Drug Use and Health.

3. Questionnaire Wording, Context, and Placement

This section discusses the differences between BRFSS and NSDUH self-reported lifetime depression diagnosis questions including information on wording differences and

questionnaire placement. By closely examining the different methodologies used in each survey, the comparability of estimates produced by these surveys can be assessed. The specific wording of questions is a key component of how respondents perceive the meaning of questions. For instance, the inclusion of specific examples or descriptions added to ensure that the respondent understood the questions may influence the respondent to narrow or broaden the meaning of the question. Question format also can affect how a respondent interprets questions.

The NSDUH question for self-reported lifetime depression diagnosis is a multiple choice response question that is assessed as part of a checklist of 20 health conditions. All respondents aged 12 or older are asked the following:

"The following is a list of health conditions. Please read the list, and type in the numbers of any of these conditions that a doctor or other medical professional has ever told you that you had.

- Anxiety disorder
- Asthma
- Bronchitis
- Cirrhosis of the liver
- Depression
- Diabetes
- Heart disease
- Hepatitis
- High blood pressure
- HIV/AIDS
- Lung cancer
- Pancreatitis
- Pneumonia
- Sexually transmitted disease, such as chlamydia, gonorrhea, herpes or syphilis
- Sinusitis
- Sleep apnea
- Stroke
- Tinnitus
- Tuberculosis
- Ulcer or ulcers
- None of the above - I have never had any of these condition".

Beginning in 2011, the BFRSS question assessing lifetime diagnosed depression was removed from the BRFSS depression module and placed in the core questionnaire within a group of questions inquiring about various chronic health conditions, such as coronary heart disease and diabetes. The BRFSS section on chronic health conditions begins with the following before any questions are asked: Now I would like to ask you some questions about general health conditions. Has a doctor, nurse, or other health professional EVER told you that you had any of the following? For each, tell me "Yes," "No," or you're "Not sure." The specific question on diagnosed depression asks "Has a doctor, nurse, or other health professional EVER told you that you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?"

Table 2 presents a comparison of these two sets of questions as they relate to questionnaire content, question placement and section content. The following similarities and differences are noted:

- The recall period is the same for both NSDUH and BRFSS, with respondents from both surveys asked to recall a diagnosis at any time in their life.
- NSDUH asks about being told by "a doctor or *medical professional*," whereas BRFSS asks about being told by a "doctor or *healthcare provider*."

It is not clear how this difference might affect comparisons between the surveys.

- NSDUH simply lists the names of the condition (depression), whereas BRFSS provides examples that describe levels of depression. The examples given in BRFSS may result in more accurate responses from BRFSS than from NSDUH.
- The checklist format in NSDUH also may elicit different responses than the single question in BRFSS. Multifaceted questions may not be answered as thoroughly as questions that cover only one topic.

Table 2. Comparison of NSDUH and BRFSS Diagnosed Lifetime Depression Questions

	NSDUH	BRFSS
Questionnaire Context	Behaviors related to substance use (stigmatized behaviors – negative perspective)	Behaviors related to health screenings and wellness (general health – positive perspective)
Prior Question Content	Tobacco and drug use initiation, drug use risk perceptions, and drug treatment utilization	Health status, health care access, screening and prevalence of hypertension and high cholesterol
Question Placement	After midpoint of interview (Section 22 out of 33)	Prior to midpoint of interview (Section 6 out of 16)
Section Content	Within 'Health Care' section, which asks about pregnancy and hospitalization	Within 'Chronic Health Conditions' section, which asks about doctor-diagnosed conditions (e.g., heart disease, asthma, diabetes)

It should be noted that in this study, self-reported diagnoses of depression was not verified clinically and may be unreliable on its own but has value when used collectively with other self-reported chronic conditions or in correlational studies. NSDUH includes questions that assess depression symptoms, which can be used to measure major depressive episode (MDE). This measure of depression is likely more reliable than self-reported diagnoses of depression by a health professional; however, MDE was only assessed in 12 states in the 2011 BRFSS.

The context of survey questions within a questionnaire can influence how respondents answer certain questions. Because the National Survey on Drug Use and Health (NSDUH) has extensive questions regarding drug use and other stigmatized behaviors, respondents may react to mental health questions from a negative perspective. In contrast, the Behavioral Risk Factor Surveillance System (BRFSS) uses a general health survey. Questions are asked of health behaviors (e.g., health screenings and physical activity) that may encourage respondents to think about their health and well-being from a more positive perspective.

In summary, although there are similarities in recall format between NSDUH and BRFSS on lifetime diagnosed depression, comparisons between estimates from these data sources should denote the differences in wording and question format. The NSDUH checklist item is asked of all respondents; therefore, comparisons of the prevalence of these diagnosed conditions between NSDUH and BRFSS should be restricted to adult respondents.

4. Estimates of Lifetime Depression

The analysis of the NSDUH data utilized the restricted-use analytic file and the BRFSS public-use file. If the public-use NSDUH dataset was used to examine the estimates of self-reported lifetime depression diagnosis, the estimates would be slightly different because of the statistical disclosure limitation methods applied to the NSDUH public-use file, though the overall conclusions would probably not change. Weighted population estimates and associated standard errors for all data were obtained using SUDAAN to take into account the complex survey designs. Percent differences were computed as $100 * (x_1 - x_2) / x_2$, where x_1 is the BRFSS estimate and x_2 is the NSDUH estimate.

Table 3. Estimated Diagnosed Lifetime Depression by Key Demographics, 2011 NSDUH and BRFSS

	Lifetime Depression				
	NSDUH		BRFSS		Percent
Covariate	Prevalence	SE	Prevalence	SE	Difference
Age	**12.88**	**0.26**	**16.85**	**0.11**	**30.82**
18-25	10.61	0.27	14.37	0.37	35.44
26-34	13.65	0.57	16.04	0.30	17.51
35-49	14.58	0.48	17.46	0.21	19.75
50-64	15.09	0.63	20.82	0.20	37.97
65+	8.22	0.63	13.03	0.16	58.52
Gender					
Male	8.47	0.31	12.65	0.15	49.35
Female	16.96	0.41	20.74	0.15	22.29
Race					
White	15.57	0.34	18.31	0.13	17.60
Black	6.76	0.52	12.91	0.31	90.98
Other	8.67	0.88	14.45	0.44	66.67
Hispanic	7.42	0.60	13.92	0.35	87.60
Education					
Less than High School	11.32	0.66	21.72	0.38	91.87
High School Graduate	11.39	0.43	16.57	0.20	45.48
Some College	15.05	0.53	18.01	0.20	19.67
College Graduate	13.19	0.50	12.92	0.15	-2.05

SE=standard error.
Source: 2011 NSDUH Analytic File, 2011 BRFSS Public Use File.

Table 3 presents the estimated prevalence of lifetime depression from the NSDUH and BRFSS by key demographics. The estimated prevalence in 2011 from the NSUDH was 12.88 (SE=0.26) as compared to the estimated prevalence from the BRFSS of 16.85 (SE=0.11). The percent difference between the total prevalence estimates was 30.82. When examining the prevalence rates by each key demographic subgroup, the majority of rates showed a higher prevalence of diagnosed depression from BRFSS compared with NSDUH. However, education level patterns were not consistent. BRFSS estimates were

twice the NSDUH estimates for those with less than a high school education, but BRFSS estimates were similar to NSDUH estimates among college graduates.

5. Summary

Understanding the differences in methodology, survey mode, and specific measures used to assess different mental health indicators from NSDUH and BRFSS can help to provide context for understanding and interpreting the various prevalence estimates provided by these surveys. Awareness of these differences and the possible causes will enable analysts to appropriately use these data in analyses. Comparing prevalence estimates for health measures from different sources of data can be challenging because national surveys vary in multiple factors that can affect these estimates, such as their objectives and scope, sampling design, data collection procedures, and specific question wording and context.

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