RADARS® SYSTEM

Researched Abuse, Diversion and Addiction-Related Surveillance System

QUARTERLY Technical REPORT

First Quarter, 2019

Redesign of Survey of Non-Medical Use of Prescription Drugs Program Improves Benchmark Estimates

Key Findings

- Careless response exclusion criteria removed 157 respondents out of 29,998 based on diverse answering patterns
- 36.3% of respondents used a smartphone or tablet to take the survey, and these respondents had a unique demographic profile
- Benchmark prevalence estimates were similar to three probability surveys after weighting scheme was applied

Introduction

Probability surveys, such as the National Survey on Drug Use and Heath (NSDUH), the National Health Interview Survey (NHIS), and the National Health and Nutrition Examination Survey (NHANES), are utilized to provide national prevalence estimates on a range of health-related topics. These surveys apply rigorous probability-based sampling methodology to generate statistically valid estimates. However, there are limitations to this approach. The data availability from these surveys is delayed, often by two years. These surveys are slow to change and require substantial investments of time and money. Drug abuse in the United States is constantly changing, and a nimble surveillance system is required to guide policy and detect new health threats. Over the past 3 years, the Researched Abuse, Diversion and Addiction-Related Surveillance (RADARS®) System has developed a national survey to provide timely, accurate prevalence estimates of drug use in the United States and six international countries: the Survey of Non-Medical Use of Prescription Drugs Program.

The Survey of Non-Medical Use of Prescription Drugs Program utilizes a panel company to obtain prescription drug use data from the general population of adults. Use of a panel company allows for frequent updates to the questionnaire (such as to add new drug products), facilitates quick access to existing survey takers, and provides complete anonymity of the respondent. From 2015 to early 2018, the RADARS System has studied the advantages and disadvantages of obtaining national data via this method. Over the course of eight survey launches, updates were made that improve the validity of the results. All of these improvements culminated in a complete redesign effort for the 3rd quarter 2018 launch of the survey. This technical report describes three key results from this redesign: 1) Careless response exclusions, 2) representation by mobile device usage, and 3) drug use estimates using a calibration weighting scheme.

Methods

Programs

Many improvements and updates were implemented over the two year period. Table 1 outlines the core characteristics of the redesign and the impact it has on the validity of the survey. All changes were applied to the 3rd quarter 2018 survey. Due to these changes, the 3rd quarter 2018 survey is considered the starting point for assessing trends of drug use.

Table 1: Summary of the Survey of Non-Medical Use of Prescription Drugs Program Redesign in 3rd Quarter 2018

Redesign Characteristic	Consequence
Use of responsive design elements, which allows the user interface to adjust based on the device being used	Improves representativeness of respondent pool by allowing mobile and tablet users easier access and improves ease of survey taking; potentially reaching difficult to reach populations
Rewrite questions using plain language	Engages low health literacy respondents
Incorporate randomization at multiple levels	Mitigates order effect bias
Developed careless response exclusion criteria	Removes respondents with low quality answers
Implemented calibration weighting scheme	Incorporates health-related information in weighting
Research covered under National Institute of Health Certificate of Confidentiality (US data)	Strengthened respondent anonymity and confidentiality protections for the data

In the 3rd quarter 2018, 148,274 invitations to participate in the survey were sent. A total of 29,998 respondents completed valid questionnaires, resulting in a 20.2% response rate. The median survey completion time was 10 minutes, 41 seconds. Quota sampling was used to obtain proportional representation of eight sex/census region strata. The proportion of valid questionnaires within each stratum was required to be between 75% and 110% of the respective stratum's US Census population proportion. The Drug Abuse Screening Test (DAST-10) was used to assess problematic drug use behavior.

Statistical Analysis

Completed surveys were assessed for careless response patterns; five criteria, adapted from literature[1,2], were used to exclude respondents. After exclusions were removed, analytical weights were calculated by generalized raking using auxiliary information with incomplete stratification[3]. Auxiliary information was obtained from the 2017 American Community Survey and NHIS. After adjustment, the sum of the weights equaled the national adult population based on the most recent census (252,063,800 in 2017). Unweighted proportions are calculated directly using response frequencies; weighted estimates incorporate the analytical weight.

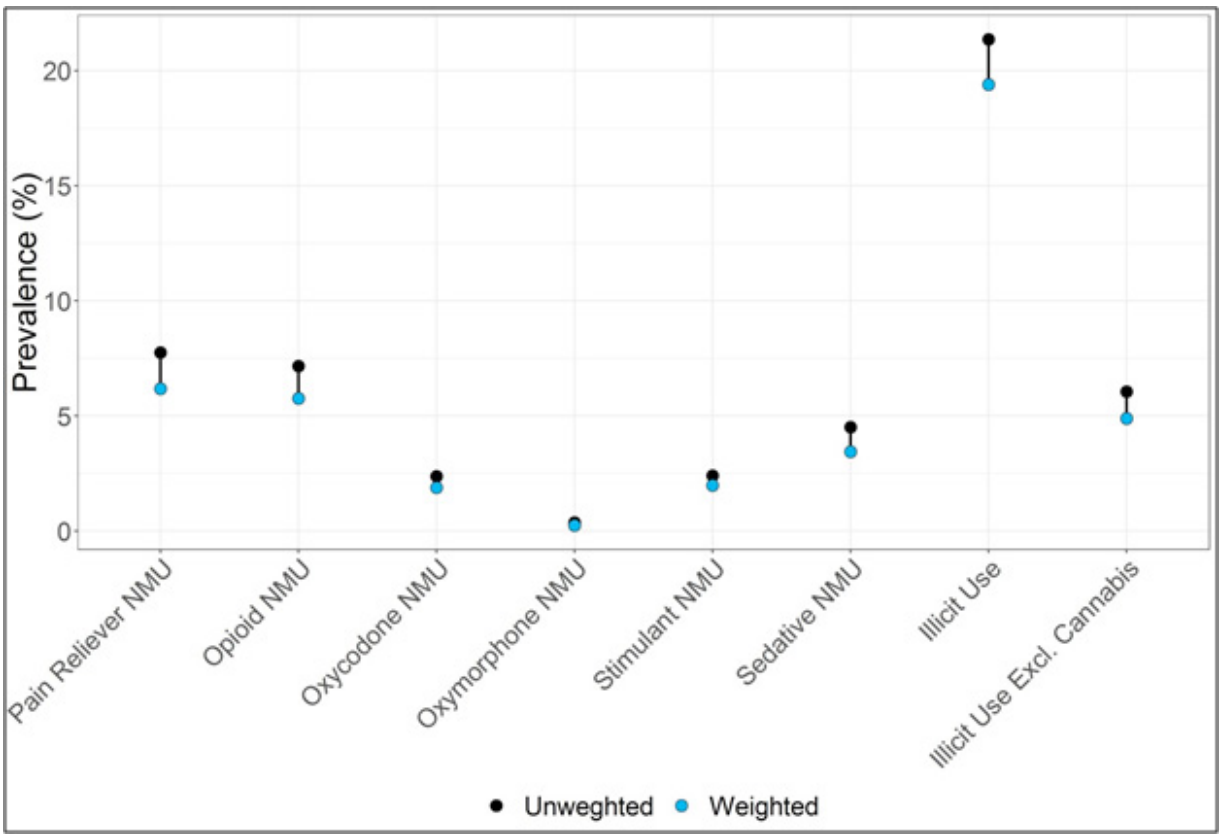
Results

A total of 157 out of 30,000 respondents were excluded by at least one of the exclusion criteria. This was 0.5% of all respondents and 0.8% of respondents who endorsed use of at least 1 drug substance. There was little overlap between methods; only 16 respondents were identified by more than one method. This resulted in 29,841 respondents included in the final dataset.

A third of included respondents utilized a mobile device to complete the questionnaire: 29.6% used a smartphone, 6.7% used a tablet, and 63.7% used a desktop. Those who used either a mobile or tablet were younger, had a lower income, had higher minority representation, and had a higher Drug Abuse Screening Test (DAST-10) score compared to desktop users.

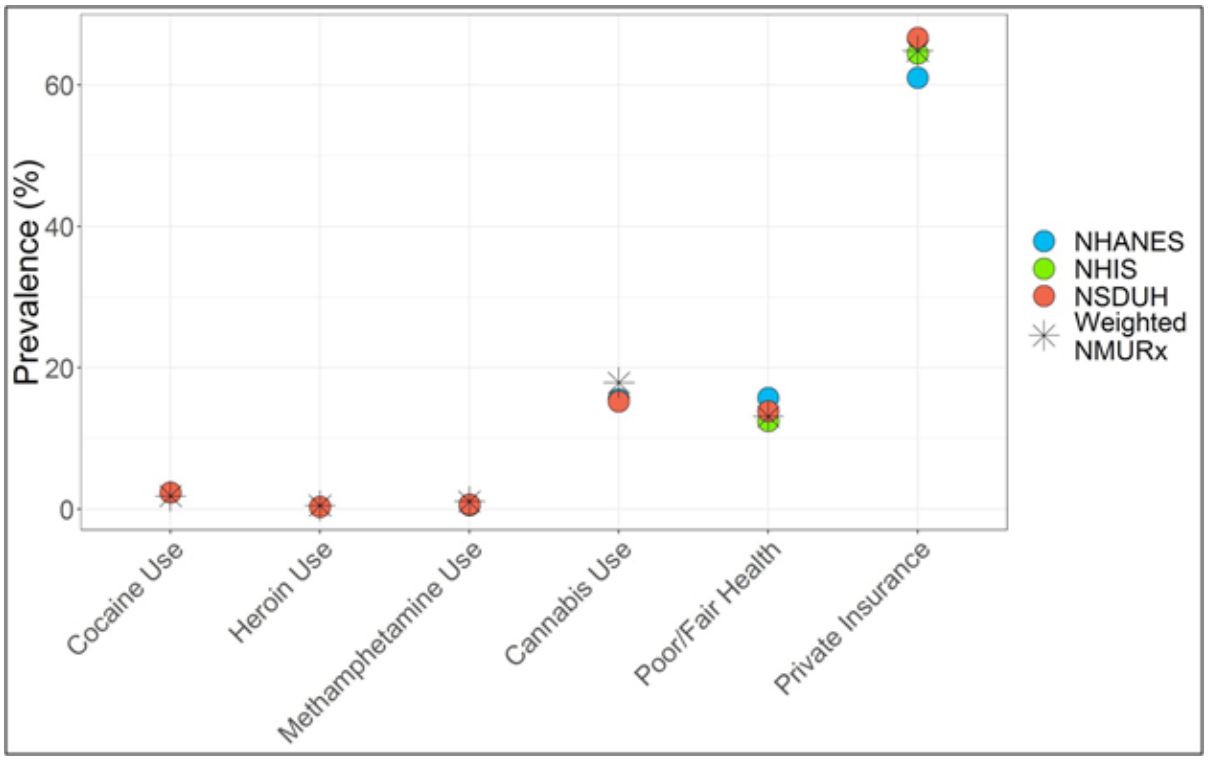
When analytical weights from the raking procedure were applied, non-medical use and illicit drug use estimate were lower than without weights applied (Figure 1). All estimates decreased with weighting, and differences ranged from -0.13 percentage points (oxymorphone non-medical use) to -2.0 percentage points (any illicit drug use).

Figure 1. Weighted and unweighted estimates of non-medical use and illicit drug use.
NMU=Non-medical use



Weighted estimates compare favorably to governmental probability surveys. Past 12 month use of four illicit substances are asked about on two surveys (NSDUH and NHANES), and two related health indicators (self-assessed health status and private health insurance coverage) are asked about on three surveys (NSDUH, NHIS, and NHANES). These were compared to the Survey of Non-Medical Use of Prescription Drugs Program (Figure 2). The Survey of Non-Medical Use of Prescription Drugs Program was within 0.5 percentage points of probability surveys for cocaine, heroin, and methamphetamine use. Probability surveys estimated lower cannabis use: 2.7 percentage points lower (NSDUH) and 2.3 percentage points lower (NHANES).

Figure 2. Estimates of Drug Use and Health Indicators for Comparable Questions.
Past 12 month use estimates from NSDUH and NHANES for the four drugs (cocaine, heroin, methamphetamine, cannabis) are present, but overlap. NHIS does not provide these drug use estimates. Weighted NMURx (black stars): Survey of Non-Medical Use of Prescription Drugs Program



Conclusions

The redesign of the Survey of Non-Medical Use of Prescription Drugs Program has improved the quality of the estimates. Careless response exclusion criteria identified a diverse set of responding patterns and removed a small number of respondents overall. While small, these respondents could differentially bias estimates, particularly of low volume drugs. Responsive design allowed more non-desktop users to complete the survey, and these individuals are a unique demographic from desktop users that were not sampled in previous launches. By aligning with the national adult profile through demographic and health-related characteristics, use of calibration weights lowers non-medical use and illicit drug use estimates and are in alignment with governmental probability survey estimates.

Suggested Citation

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References

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[2]Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. Journal of Experimental Social Psychology. 66. 4-19. DOI: 10.1016/j.jesp.2015.07.006

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