

## Incidence and Impact of Controlled Access Situations on Nonresponse

David Cunningham<sup>1</sup>, Laura Flicker<sup>1</sup>, Joe Murphy<sup>1</sup>, Jeremy Aldworth<sup>1</sup>, Susan Myers<sup>1</sup>, &  
Joel Kennet<sup>2</sup>  
RTI International<sup>1</sup>  
Substance Abuse and Mental Health Services Administration<sup>2</sup>

### ABSTRACT

The term “controlled access” applies to any situation where an obstacle keeps an interviewer from reaching the door of a potential respondent (Murphy et al., 2003). Failure to collect data from dwelling units with controlled access may introduce bias through systematic under-representation of certain sub-groups. For example, high-income and urban households are more commonly found in controlled access situations than other sub-groups in the United States population (Blakley and Snyder, 1999).

This paper summarizes the incidence of controlled access by dwelling unit type and state for all 169,535 2004 National Survey on Drug Use and Health (NSDUH) sample dwelling units, and introduces a model that predicts the effects of controlled access barriers on unit and item nonresponse. The rate of controlled access we found was comparable to that found by Ziniel and Groves (2003). As predicted, housing units with some form of controlled access were less likely to be successfully screened or interviewed. In addition to discussing these findings, we present ideas for further investigation of the role that controlled access barriers have on nonresponse error and data quality.

**Keywords:** Controlled access, limited access, nonresponse, restricted access

### Introduction

In recent years, the National Survey on Drug Use and Health (NSDUH), a federally sponsored annual survey that gathers data on substance use among the non-institutionalized household population of the United States, has seen an increase in the amount of nonresponse attributed to controlled access. To further investigate this topic, NSDUH began systematically capturing housing characteristics and controlled access type (regardless of whether the feature actually prevented access) for every sample dwelling unit (SDU). With these data available for the first time, we are able to analyze prevalence and

correlates of controlled access type and predict field outcomes. This paper provides such an analysis on data collected for the 2004 NSDUH survey.

### Methods

We cross-tabulated controlled access and housing characteristic data to describe the 2004 NSDUH sample. We developed regression models to predict unit and item nonresponse, with the expectation that controlled access and housing units other than single family homes contribute to nonresponse.

### Results

The prevalence of controlled access barriers varied by state and was higher in the eight states with large samples<sup>1</sup> than in the small sample states. Washington, D.C. had the highest level of controlled access (61%) and Mississippi had the lowest level (2%). At the state level, there was an inverse relationship between the percentage of SDUs with controlled access and screening response rate (SRR). This suggests, although it does not prove, that higher levels of controlled access may cause lower response rates.

Controlled access features were present in 17% of all SDUs. The most common feature was an intercom/buzzer system, encountered in 7% of SDUs. The next most common controlled access features were physical barriers, such as gates or locked building doors (6%), and guards or doorpersons (4%). Intercoms were most common in apartments/condominiums; guards were most common with group quarters units; and physical barriers were most common with units on military bases.

<sup>1</sup> Large sample states were the eight U.S. states with the largest populations (CA, FL, IL, MI, NY, OH, PA, and TX). They were sampled at four times the rate of small states in order to allow small area estimation of drug use.

In 2004, NSDUH's unweighted SRR was 91%.<sup>2</sup> SRR varied according to housing type. A relatively high SRR was attained for single housing units—93%. SDUs in buildings with 50 or more units had the lowest SRR—85%.

With respect to controlled access features, SRR was highest for SDUs with no controlled access—93%. It was lowest when a guard or doorman was present (79%) or when “other access” features were present (78%).

In 2004, NSDUH's unweighted interview response rate (IRR) was 83%.<sup>3</sup> SDUs in group quarters structures, in student housing, on military bases, and on Native American tribal lands had much higher IRRs—as high as 94%.<sup>4</sup>

Other findings of interest from cross tabulations include the following:

- Language barriers were most frequently encountered in apartment/condo buildings.
- Physical barriers were more often associated with screening refusals than interview refusals.
- Guards and physical barriers were more common in medium-to-high income areas than low-income areas.
- Urban areas had fewer single housing units, and more multiple unit buildings—especially apartment/condo buildings with 50 or more units.
- The prevalence of controlled access was significantly higher in the Northeast region than in the other three U.S. regions (23% vs. 15%,  $p < 0.0001$ ).
- The prevalence of controlled access was significantly higher in the large sample states than in the small sample states (23% vs. 13%,  $p < 0.0001$ ).

We modeled unweighted 2004 NSDUH data to assess the impact of controlled access and housing type on item and unit nonresponse. For item nonresponse, we employed linear models to predict the number of blank or refused questions in the interviewer-administered and self-administered sections of the

<sup>2</sup> The weighted SRR was 91%. We report unweighted response rates because they directly reflect the experience of field staff.

<sup>3</sup> The weighted IRR was 77%.

<sup>4</sup> These types of SDUs comprise less than 3% of the NSDUH sample.

NSDUH. For interviewer-administered questions there was a main effect for controlled access, such that it *increased* item nonresponse. Introducing an interaction term (controlled access\*housing type) found *increased* nonresponse among housing types other than single dwelling units.

For self-administered questions, there was a main effect for single dwelling units insofar as they produced *decreased* item nonresponse. Controlled access showed no main effect. Adding the interaction term (controlled access\*housing type) found *increased* item nonresponse among single dwelling units with controlled access and *decreased* item nonresponse among single dwelling units without controlled access.

For unit nonresponse, we predicted screening and interviewing outcomes, including in both models the interaction term and a 3-level predictor for urbanicity. Even controlling for population density, controlled access reduced the odds of screening, whereas the absence of controlled access in single dwelling units increased the odds of screening. Controlled access in single dwelling units suppressed interview response much more than controlled access in other kinds of units. For both of these models, Hosmer and Lemeshow (Hosmer & Lemeshow, 2000) goodness-of-fit tests failed, although that was likely due to the large number of cases included in the analysis.

## Discussion

The vast majority of NSDUH SDUs were single-family housing units with no controlled access. In general, when controlled access was present, screening success was negatively affected. Dwelling units where controlled access features were common, such as multi-unit structures with 10 or more dwelling units and student housing, tended to have lower SRRs than other dwelling units. Moreover, the SRR in areas where controlled access was uncommon, such as single-family housing units and Native American tribal lands<sup>5</sup> were higher than in areas where controlled access was more common.

<sup>5</sup> While many Native American tribal lands have no controlled access, we have learned through many years of experience on NSDUH to respect the property and customs of these individuals; therefore, we typically seek permission from tribal leaders before approaching any dwelling units on tribal lands. We believe this approach may have contributed to our success with these dwelling units.

These findings confirm anecdotal evidence we have received from field observations and feedback from field interviewers.

Controlled access contributed significantly to unit level nonresponse at both the screening and interviewing stages. Some specific controlled access features appeared to impede screening success more than others. Dwelling units where access was limited by a guard had a screening response rate almost 12% lower than the national average. Also, dwelling units in locked buildings where initial contact had to be made by using an intercom had a SRR more than 8% below the national average. Given our finding that some controlled access features such as guards and physical barriers were more common in medium-to-high income areas than low-income areas, there is reason to believe that nonresponse due to controlled access leads to higher-income groups being underrepresented in the NSDUH sample. Similarly, the higher prevalence of controlled access in the Northeast region than in the other three U.S. Census regions and in large sample states vs. small sample states, possibly due to urban populations representing a larger proportion of the sample in those areas, may suggest that urban populations are underrepresented. We will investigate these issues further with more extensive regression analyses.

As noted above, we obtained higher IRR for dwelling units in group quarters structures, in student housing, on military bases, and on Native American tribal lands. Our success may be due in part to residents assuming that if we gained access through the gatekeeper, then the study must be legitimate. Our success may also have been due to the skill of the interviewers. Since we typically assign the cases judged to be most difficult to our most experienced, successful interviewers, these cases may have had higher success rates regardless of the controlled access features.

It is interesting to note that preliminary analyses suggest controlled access and housing types other than single dwelling units may increase item nonresponse, especially to the interviewer-administered portion of the survey. This might be due to respondents or interviewers paying too little attention to details when completing the interview. For example, because gaining access was difficult and could be revoked, interviewers may feel rushed to complete an interview because they are concerned about being asked to leave. Further research is needed to better understand this finding.

By quantifying the incidence of housing characteristics and controlled access as well as their correlations with screening and interviewing success, we can improve our research practices. From a field management perspective, we can use this information to identify situations where we are most successful in reaching dwelling units and then dig further to determine what successful actions can be applied in other situations. In addition, we can use this information to identify interviewers most successful at overcoming access barriers, assess what behaviors contributed to the success, and use that information to train other interviewers. Also, by combining this information with the average number of call attempts required to complete cases, we can calibrate cost per case and response rate goals for different regions of the country. Doing so may enable us to establish more realistic performance goals for areas in the Northeast where multi-unit buildings are very common. From a data analysis perspective, we think the access information could be used in non-response adjustment during the weighting process to reduce the non-response bias. In fact, one of our next steps in this line of research is to investigate further the possibility of using controlled access data in this manner.

## REFERENCES

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