Identifying Causes of Verification Refusals on a Large Nation-Wide Field Study Using a Multilevel Model

Dustin Williams[1], Christina Touarti[1], Christine Clark[1]
Jason Butler[1]
[1]RTI International, 3040 Cornwallis Rd, PO Box 12194, Research Triangle Park, NC 27709

Abstract
Verification data that are accurate and collected according to project protocols are an essential part of field studies. In particular, verification offers assurance to survey sponsors and the public that data are valid and reliable. On the National Survey on Drug Use and Health (NSDUH), respondents are asked to provide contact information so that project staff may call to check on the quality of completed household screenings and interviews. Refusal of such information by respondents impedes the ability to verify field work or, at best, introduces delays and added expense to the process. Identifying the causal factors for the absence of verification contact data allows for remedial actions, thus reducing costs and increasing quality.

This paper presents the results of an analysis of verification refusals from the 2009 NSDUH. First conducted in 1971, NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) and provides national, state and sub state data on substance use and mental health in the civilian, noninstitutionalized population age 12 and older. Approximately 140,000 household screenings and 67,500 interviews are completed annually.

Questions persist as to whether high verification refusal rates are caused by interviewer performance and noncompliance with protocols, privacy concerns among respondents, protocols and forms needing improvement, or community characteristics. This paper uses logistic regression to examine the effects of field interviewer performance measures and area demographic characteristics on the collection of verification contact information. Field interviewer performance is measured by production, cost, and data quality indicators. The demographic characteristics of sampling areas, or segments, are based on Census data. We discuss the effect each of these variables has on verification data in order to identify explanations for patterns in verification refusal rates.

Key Words: Telephone verification, refusal, field interviewer performance

1. Introduction

In-person surveys employ field interviewers who work independently when contacting households and respondents. Since field interviewers are without a supervisor when data is collected, project management must be able to verify the quality of interviewers' work after it is completed. Verification data inform management whether interviewers are following project procedures, representing the project appropriately, contacting the correct households and respondents, and honestly reporting completed work.

The National Survey on Drug Use and Health (NSDUH) relies primarily on telephone verification to verify interviewers' work. This process relies on active consent from the respondent to the verification process, as they must agree to verification and provide a telephone number. Regardless of the method of verification, the respondent is informed of and must consent to verification. However, passive consent, such as informing the respondent that a call may be recorded for quality assurance, does not require action on the part of the respondent, and it is believed this significantly reduces monitoring/recording refusal rates (Speizer, Kinsey, Heman-Ackah, and Thissen, 2009). Therefore in-field surveys which use telephone verification can expect higher verification refusal rates than studies that use other methods of verification which require less effort on the part of the respondent, which makes it helpful to understand possible causes for verification refusals.

When a respondent does not agree to the verification process, or refuses, the project is unable to confirm that an interviewer completed reported work without additional time and expense. When an interviewer has a high rate of refusals for verification, it raises serious concerns about the quality of his/her work and questions persist as to the reason for high verification refusal rates. Possible explanations for refusals include community characteristics and privacy concerns among respondents. For example, a case study of computer audio-recorded interviewing (CARI) refusal rates showed that women were slightly less likely to refuse than men, and non-Hispanic Whites and non-Hispanic Blacks were less likely to refuse than other race/ethnic groups (Mitchell, Fahrney, and Strobl, 2009).

However, how other factors (including project protocols and forms needing improvement, interviewer performance, and interviewer noncompliance with protocols) influence verification refusal rates must be considered. While a high number of verification refusals may be due to the neighborhood selected or the respondent population, it could also be the result of improper delivery or explanation of the verification process, such as emphasizing that the respondent is not required to agree to the process nor provide contact information (Thissen, Sattaluri, Barber, and Fisher, 2008). In some cases, high verification refusal rates are the result of interviewer shortcutting or falsification, where interviewers indicate verification refusals to intentionally prevent their work from being verified. Determining how different variables impact verification refusal rates can provide project management with valuable insight and strategies for improvement.

This paper explores the impact of community characteristics and interviewer performance on verification refusal rates in a large nation-wide study using logistic regression. Interviewer performance is measured by production, cost, and data quality indicators. Community demographics are based on Census data.

1.1 Background
Data for this paper is from the National Study of Drug Use and Health (NSDUH), an annual survey sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). First conducted in 1971, this field survey provides national, state, and sub state data on substance use and mental health in the civilian, non-institutionalized population age 12 and older. Approximately 140,000 household screenings and 67,500 NSDUH interviews are completed annually. Approximately 700 field interviewers are employed on the project.

Data is collected on a quarterly basis and addresses are sampled from specific geographic areas, called segments, based on US Census and population data. Interviewers contact the selected households and complete a screening to determine if any residents are eligible for the interview and roster any eligible household members to see if anyone will be selected for the interview using a hand-held computer. One, two, or no persons in each household may be selected for the interview. If no one from the household is selected or eligible for the study, the interviewer asks the respondent to provide a telephone number for verification and enters the number into the hand-held computer.

If someone is selected for the interview, the field interviewer conducts the interview using a laptop computer. Toward the end of the interview, the respondent is asked to write a contact telephone number and address on a form used for quality control purposes, place the form in an envelope addressed to RTI, and seal it. If the respondent does not have a phone number or does not want to provide one, the interviewer instructs the respondent to write that on the form. The interviewer then mails the sealed envelope to RTI.

A percentage of screenings and interviews completed by each field interviewer is randomly selected to undergo the telephone verification process. Additionally, some cases may be selected for verification due to concerning circumstances, such as abnormally short interview times. The telephone interviewers contact respondents and ask them a few questions to determine whether our interviewers contacted them, followed project protocols, and represented the study appropriately. If project management has specific concerns about an interviewer, they can increase the percentage of work verified.

At times, field interviewers report being unable to collect verification contact information for some of their completed cases and these cases are unable to undergo the standard telephone verification process. Situations in which the respondent reports not having a phone number to give, refuses to provide one, or does not write one on the Quality Control form are recorded as either "No Phone" or "Refusal" in project management reports. Staff review these reports regularly to identify any concerning trends and administer appropriate action ranging from re-training interviewers on strategies for collecting verification data from respondents to issuing disciplinary action to forcing a larger percentage of the interviewer's work into verification.

During re-trainings, the interviewers and field supervisors explore explanations for a high rate of verification refusals or no phones as well as strategies to overcome these obstacles. Sometimes these obstacles are attributes of the community (or perceptions of the community) in which the interviewer works, such as low income areas where respondents may not have a phone number or high crime areas where respondents are suspicious of our staff. Other times supervisors cite interviewer performance as a reason for higher verification refusal rates. For example, an interviewer who has low response rates is not a strong performer and therefore may also have low rates for verification data.

While this information can potentially be helpful in interpreting the reasons for verification refusal rates, these are subjective explanations with a lot of variability. One interviewer's description of low income may be different than another's, just as the description of poor performance can vary from one field supervisor to another. Therefore, looking objectively at the relationship of verification refusals and no phones to

interviewer performance and community demographics will provide valuable insight to understanding missing verification data.

2. Methods

For this analysis, data from Quarter 1 2009 through Quarter 4 2009 on the NSDUH were used. During this time, 7,183 segments were selected and 185,870 cases were completed in which interviewers asked for verification information (68,752 interview cases and 117,116 screening cases). A total of 5,760 verification refusals were recorded, for a national refusal rate of 3.10%. A total of 3,502 respondents reported not having a phone number for a 1.88% no phone rate. For the purposes of this analysis, no phones are included as refusals since it is uncertain if reports of no phones are really passive refusal by respondents.

Table 1: Verification Refusal Rates

	Screening Cases	Interview Cases	Total
Number Completed	117,118	68,752	185,870
Number Refused	5,746	14	5,760
Refusal Rate	4.91%	0.0002%	3.10%
Number No Phone	2,710	792	3,502
No Phone Rate	2.31%	1.15%	1.88%

Several measures of interviewer performance and area characteristics thought to be related to verification were used as predictors in the model. Logistic regression was used to determine the significance of each variable to refusal rates.

2.1 Segment Information
The NSDUH sample is determined using US Census and population data. States are divided into specific geographic areas called segments. The logistic regression analysis accounts for the effect of the following segment variables:
- Census region (Northeast, Midwest, South, and West).
- The estimated percent of the segment population that is of Hispanic ethnicity.
- The estimated percent of the segment population that is Black or African American.
- The estimated percent of segment dwelling units that are Group Quarter units. (On the NSDUH, any single structure in which ten or more unrelated persons reside is considered a Group Quarters structure. Examples include college dormitories and transient shelters.)

On NSDUH, segment variables are determined using block-level data from the 2000 Census adjusted to the 2007 population projections from Nielsen Claritas. As segments consist of one or more Census blocks, the person and dwelling unit level estimates for Census blocks are then aggregated to the segment level.

2.2 FI Performance Information
Field interviewer performance is measured quarterly according to seven variables which captured an interviewer's performance on in terms of production, data quality, and cost.
- Screening Response Rate – The number of screenings completed compared to the number of cases assigned throughout the quarter.
- Interview Response Rate – The number of interviews completed compared to the number of interviews assigned throughout the quarter.

- Errors Per Screening – The ratio of data quality errors to the number of screening completed. Errors include problems discovered through telephone verification as well as procedural errors that are caught through various management reports, such as using the wrong case identification numbers in the computer system and on project forms.
- Errors Per Interview – The ratio of data quality errors to the number of interviews completed. Errors include problems discovered through telephone verification as well as procedural errors that are caught through various management reports, such as using the wrong case identification numbers in the computer system and on project forms.
- Hours Per Interview – The average number of hours an interviewer works to complete an interview. Hours worked are reported weekly by interviewers.
- Miles Per Interview – The average number of miles an interviewer travels to complete an interview. Miles are reported weekly by interviewers.
- Miscellaneous Expenses Per Interview – The average miscellaneous expense an interviewer incurs to complete an interview. These expenses include items such as the cost of tolls, mailing materials to their supervisor, and travel costs related to overnight trips, and are reported weekly.

For each variable, interviewers were classified on quartiles. Since all areas of performance are important in evaluating an interviewer's work, the seven quartile rankings were averaged to create an overall field interviewer performance score.

2.3 FI Falsification
In addition to measuring interviewer performance as outlined above, all interviewers that had been caught falsifying data in 2009 were included for analysis. In 2009, 12 interviewers were found to have falsified 122 screenings and 56 interviews. However, all cases that they worked throughout 2009 were identified for comparison.

3. Results

As Table 2 shows, a number of variables were significantly related to verification refusals in this analysis. Field interviewer performance has a negative effect on refusal rates, while identified falsification is positively related to verification refusals. In terms of community demographics, areas with higher percentages of African American and Hispanic populations had a higher rate of refusal, while areas with a higher percentage of group quarter units had lower refusal rates.

Figures 1 through 6 illustrate the effects of the variables on verification refusal rate by showing the verification refusal rates, expressed as a percentage, for each variable (broken down into sub categories) Figures 1 and 2 look at the demographics of the community, showing that the verification refusal rate increased as the percent of the population within a segment that is Hispanic or African American increased. Figure 3 shows that verification refusals rates dropped as the percent of dwelling units within a segment that are a group quarter units increased.

Table 2: Effect of Community Characteristics and FI Performance on Verification No Phone/Refusal Rates (*n* = 185,867)

	Unstandardized Regression Coefficient	Standardized Regression Coefficient	Significance (P Value)
(Intercept)	-2.5190	0.0553	< 0.0001
Midwest Census Region	-0.0593	0.0333	0.0741
Northeast Census Region	-0.2070	0.0359	< 0.0001
South Census Region	0.2432	0.0309	< 0.0001
West Census Region	0.0000	-	-
% Hispanic	0.0024	0.0006	< 0.0001
% African American	0.0029	0.0005	< 0.0001
% Group Quarter Units	-0.0075	0.0013	< 0.0001
Interviewer Performance Score	-0.1945	0.0190	< 0.0001
Falsification Identified	0.4463	0.1176	0.0001
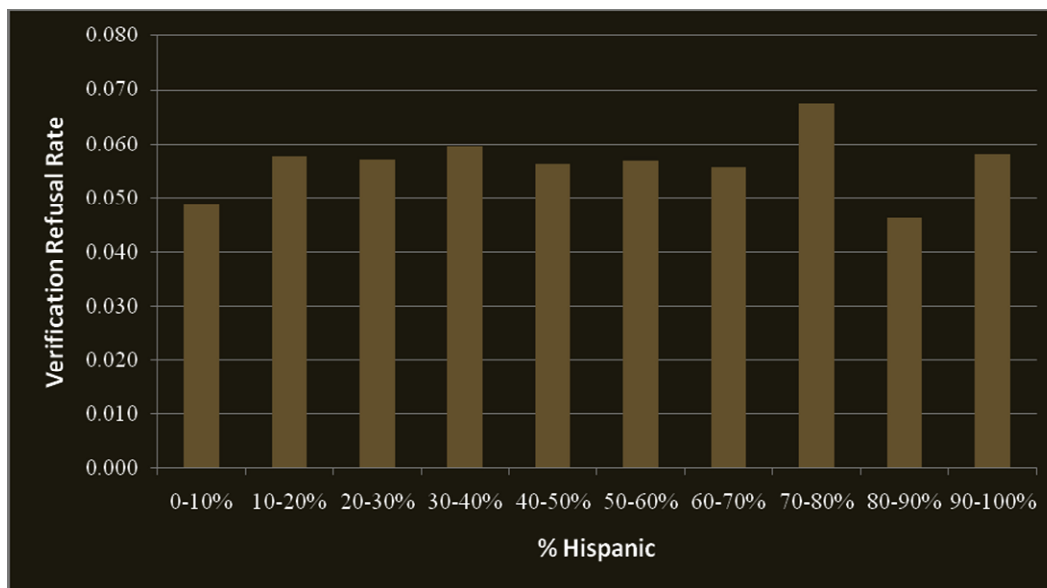
Figure 1: Verification Refusal Rates by % Hispanic (*n* = 185,867)
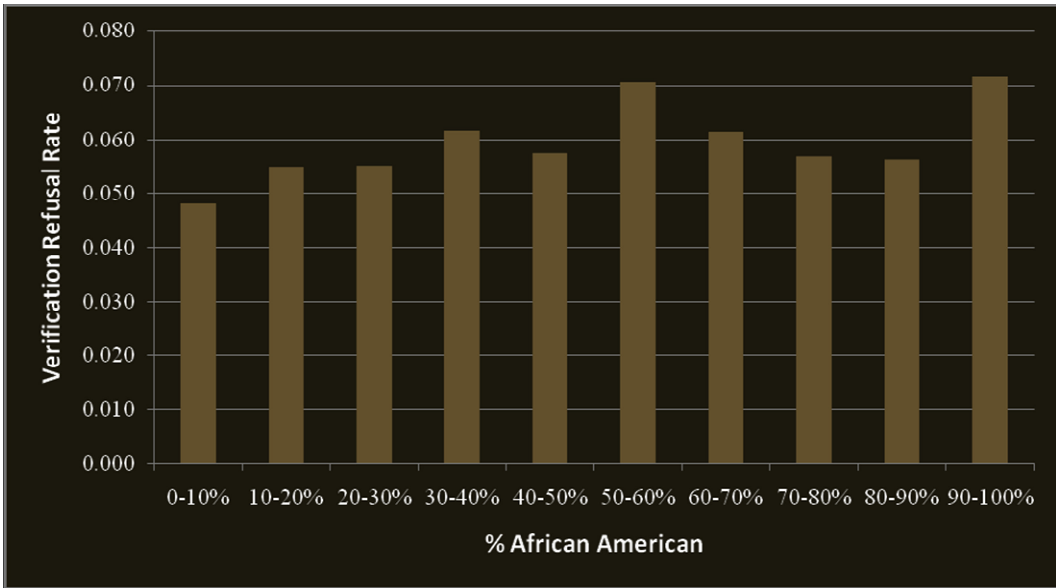
Figure 2: Verification Refusal Rates by % African American ($n = 185,867$)
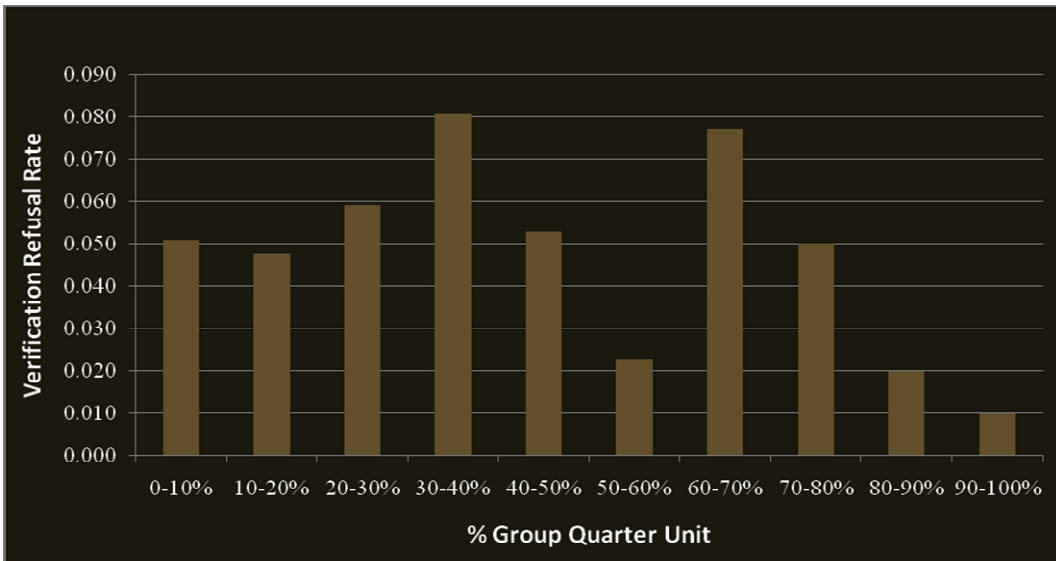
Figure 3: Verification Refusal Rates by Group Quarter Units ($n = 185,867$)

Figure 4 shows that field interviewers who received higher FI performance scores had lower verification refusal rates. This suggests that better performing interviewers are also better at collecting quality verification information.
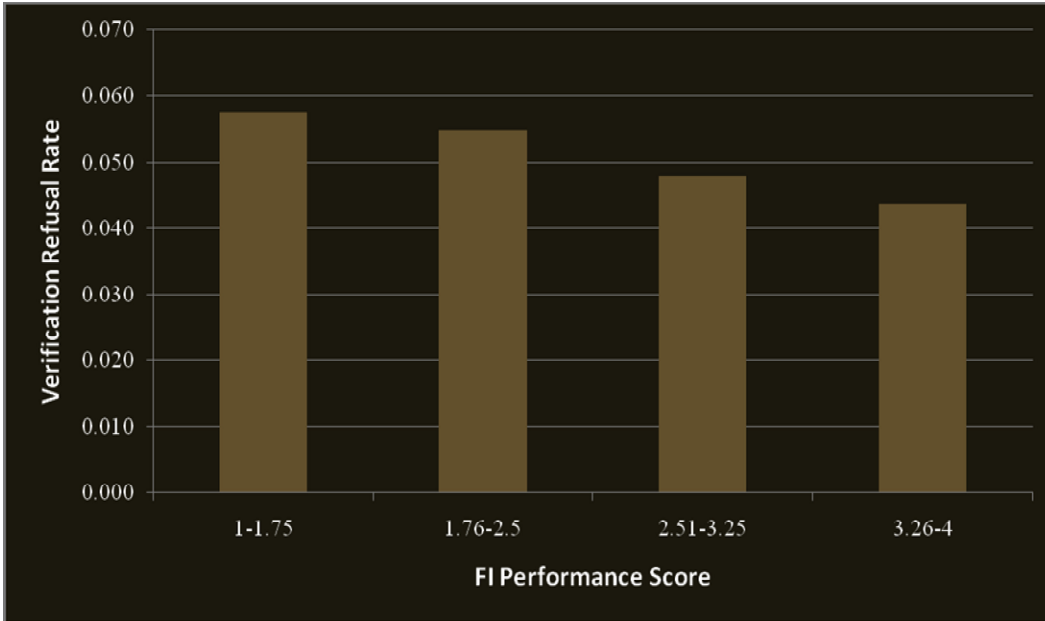
Figure 4: Verification Refusal Rates by FI Performance Score (n = 185,867)

Figure 5 shows that the verification refusal rate was higher for cases worked by field interviewers who were not caught falsifying cases. This finding is counterintuitive as we would expect cases where a respondent was not contacted to have a higher number of no phones or refusals to mask the lack of a phone number for verification. One possible explanation is that field interviewers were making up a phone number to throw project management off their track. The sample size of cases worked by field interviewers was very small (.005% of all cases) and more cases may be needed to properly assess this relationship.
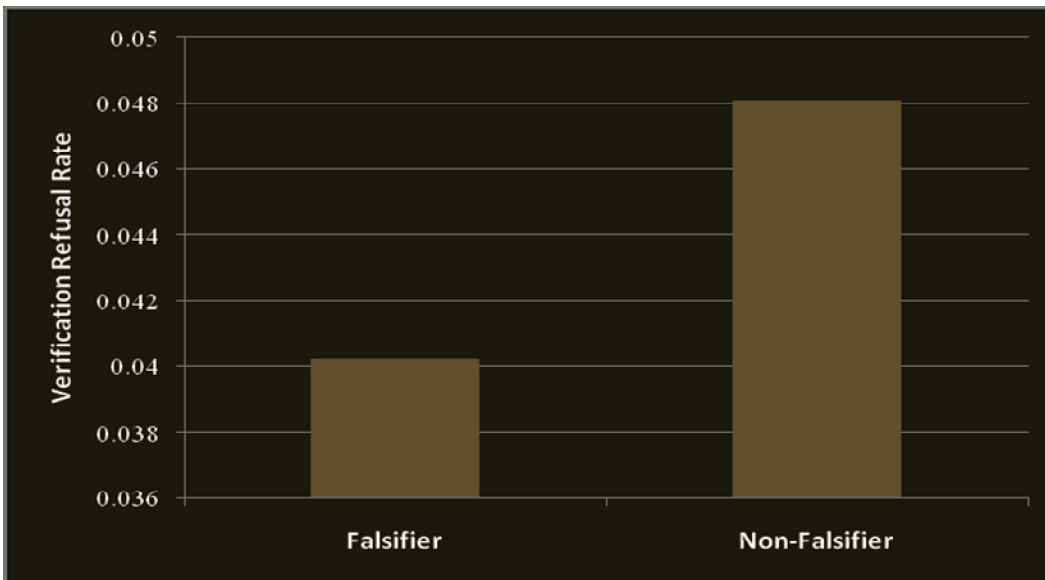
Figure 5: Verification Refusal Rates by FI Falsification (n = 185,867)

One particularly interesting result was the significance of the Census region to refusal rates—for the logistic regression we used the West as our reference region. As Figure 6 illustrates, the highest refusal rates are in the South Census region, while the Northeast region has the lowest refusal rates. This was surprising considering that traditionally the South has higher response rates in the study than the Northeast.
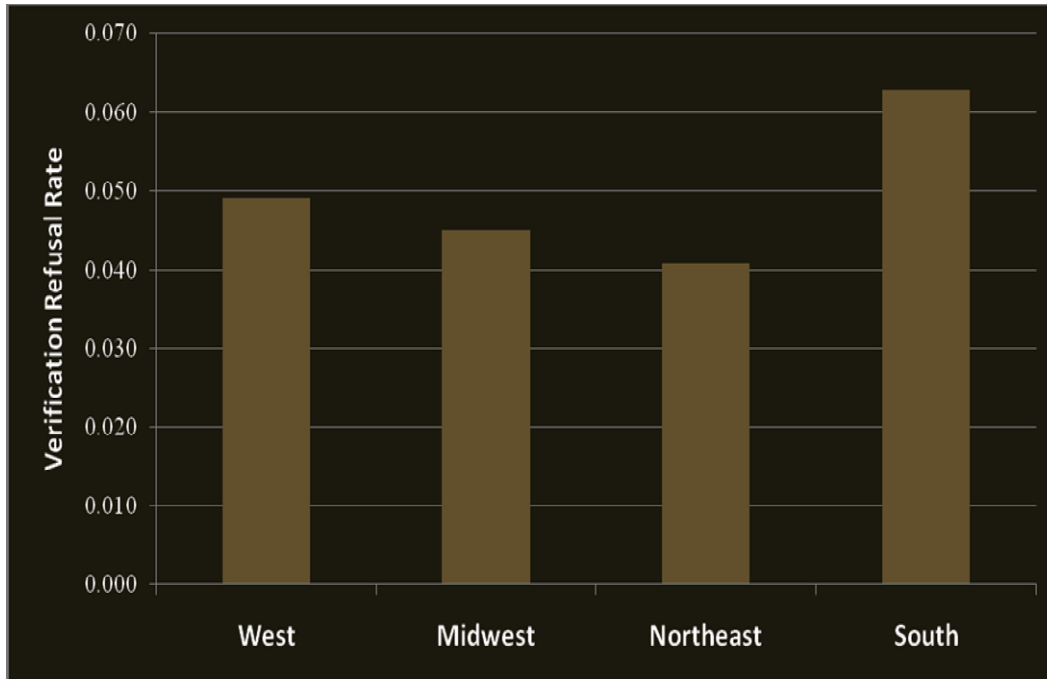

Figure 6: Verification Refusal Rates by Census Region ($n = 185,867$)

After accounting for Census region, there were noticeable variations between regions for the variables of group quarter units, Hispanic population, and interviewer performance. Figures 7 through 9 show the verification refusals rates by these variables while accounting for regional differences. Figure 7 shows that at as the percent of group quarter units increases, the verification refusal rate decreases. Figure 8 shows the opposite relationship with the Hispanic population. As the percent of the Hispanic population increases, the verification refusal rate increases. Note that this is particularly true for the Midwest and South regions where there were large spikes in the refusal rates. Finally, Figure 9 shows a negative correlation between the Interviewer Performance Score and verification refusal rates.
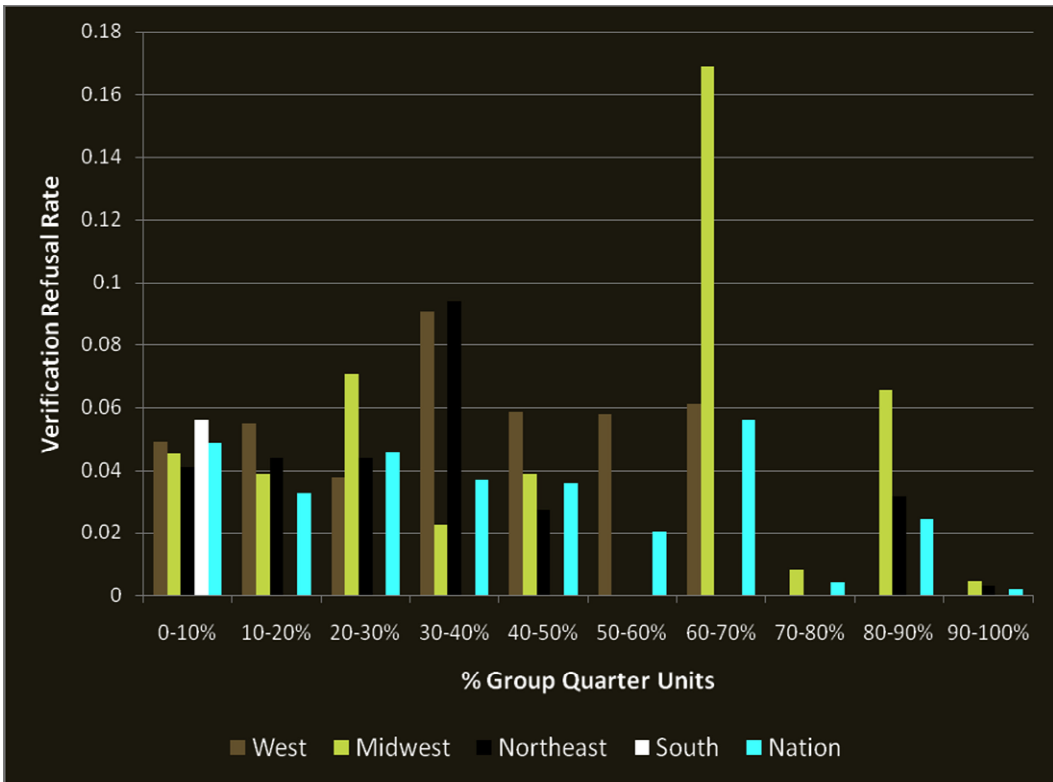
Figure 7: Verification Refusal Rates by % Group Quarter Units and Census Region (*n* = 185,867)
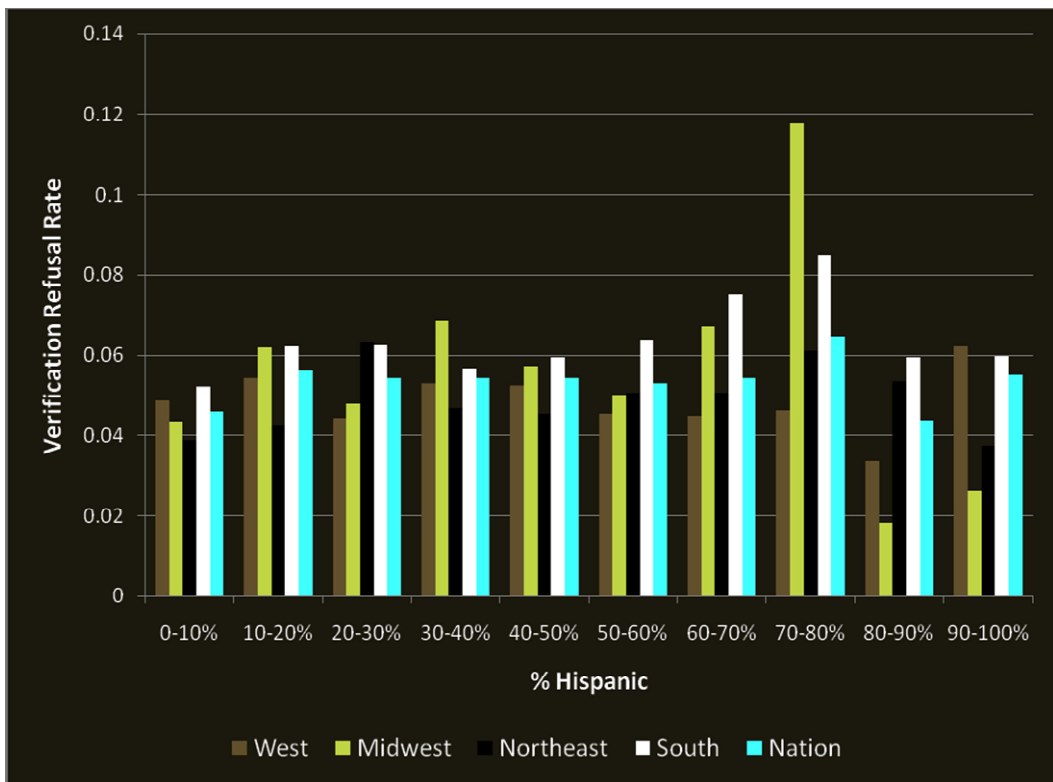

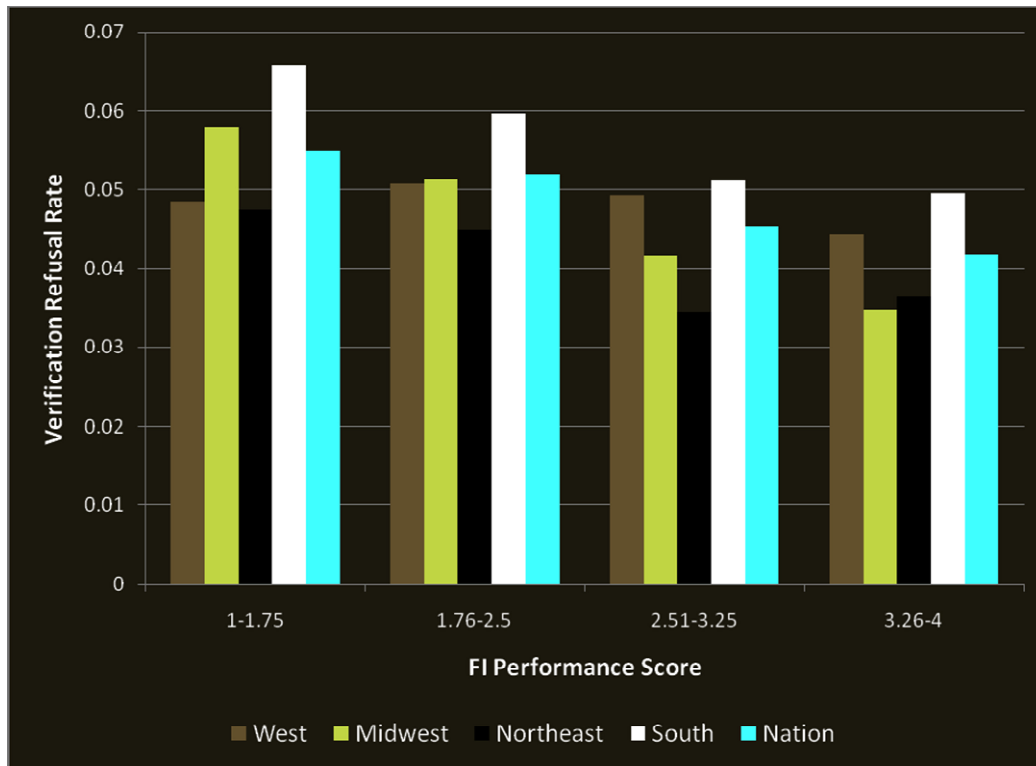**Figure 8:** Verification Refusal Rates by % Hispanic and Census Region (*n* = 185,867)

Figure 9: Verification Refusal Rates by Interviewer Performance Score and Census Region (*n* = 185,867)

4. Conclusions

There are many possible explanations for high verification refusal rates. However, explanations from the field are often subjective and inconclusive. This analysis explored objective measures of community characteristics and interviewer performance to provide insight on causes of verification refusals. Initial findings in the logistic regression indicated a number of community demographics, as well as interviewer characteristics including interviewer performance and falsification, significantly relate to verification refusals. However, this analysis also revealed regional differences which need to be explored.

Adjusting for Census region showed the percent of group quarter units, percent Hispanic, and the Interviewer Performance Score had a noticeable impact on verification refusal rates. When examining an interviewer's verification refusal rate, the percent of the segment population that is Hispanic and living in group quarter units, and the FI's performance in respect to response rates, data quality errors, and production costs should be taken into account. Furthermore, attention should be paid to field interviewers with higher performance scores to understand their success in collecting verification information.

4.1 Limitations and Future Research
The results of this presentation are limited in the fact that they do not account for other variables that may impact refusal rates, such as individual characteristics of respondents. Additionally, this paper does not explore differences between screening refusals and interview refusals. Furthermore, there is no way to differentiate between situations where

respondents say they do not have a phone number as a hidden refusal and situations where they really do not have a phone number for verification.

Future research should account for respondent characteristics, such as age and gender. Furthermore, the relationship between race and ethnicity and verification refusal rates should be examined more closely. Also, the difference between trends in no phone and refusal cases should be examined using a multinomial logit analysis. Finally, the performance of selected cases in verification can be examined to determine trends based of segment and interviewer characteristics.

Acknowledgements

References

Mitchell, S. B., Fahrney, K. M., and Strobl, M. M. (2009, May). *Monitoring field interviewer and respondent interactions using computer-assisted recorded interviewing: A case study*. Presented at 2009 AAPOR Conference, Hollywood, FL

Speizer, H., Kinsey, S. H., Heman-Ackah, R. K., and Thissen, M. R. (2009, November). Developing a common, mode-independent, approach for evaluating interview quality and interviewer performance. In *Federal Committee on Statistical Methodology*, Washington, DC.

Thissen, M. R., Sattaluri, S., Barber, L. B., and Fisher, C. (2008, October). *Computer audio-recorded interviewing (CARI) as a tool for monitoring field interviewers and improving field data collection*. Presented at International Methodology Symposium 2008, Statistics Canada, Gatineau, QC, Canada.