Survey Administration in the Wake of a Natural Disaster

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Abstract
A mere two months after a devastating earthquake struck Haiti in early 2010, our goal was to collect quality data to inform aid decisions by measuring the earthquake's economic impact and any changes in household composition. Because of the extent of the damage to the country's physical infrastructure and the precarious living conditions of many Haitians, and the slow nature of recovery work, data collection presented several challenges. Our initial objective of conducting an area sample proved unfeasible, given the situation on the ground. Consequently, the researchers decided to conduct a survey entirely by mobile phone, which required special consideration be given to minimizing non-sampling errors. We will focus on questionnaire development, cooperation incentives, as well as logistical considerations, in light of the challenges that this collection mode poses for measurement, non-response, and coverage errors.

Key Words: Haiti, natural disaster, non-sampling errors, mobile-only survey

1. Introduction

The decision to collect data just two months after the January 12, 2010 earthquake in Haiti presented particular challenges. Infrastructure was so badly damaged that an area sample household survey was not feasible or affordable. We conclude that a random digit dial (RDD) mobile phone-only (MPO) survey was an appropriate data collection method for the situation and subject to only a small coverage bias. The subject matter of the survey was tightly connected to the mode of data collection. The incentive used was also strongly influenced by the mode of data collection.

2. Subject Matter and Choice of Mode

2.1 Initial Goal and Problems
In the days and weeks immediately following the earthquake, the Haitian government reported the number of deaths to be anywhere from 100,000 to 230,000. The figures were not based on either a census of bodies or a statistical sample. When our team of statisticians went to Haiti in March, the goal was to determine the feasibility of conducting a generalizable sample to estimate mortality and morbidity due to the earthquake.

The current best method for estimating mortality and morbidity is used with some frequency in the area of human rights statistics. Because any individual frame could be incomplete, statisticians have developed a method called Multiple Systems Estimation

(MSE), which is a version of the familiar capture-recapture method. MSE takes into account the overlap of multiple sources, which can be lists of housing units, administrative records, or censuses. From Colombia to East Timor, MSE has been a valuable tool to human rights researchers.

2.2 Mode Decision and Consequences

In Haiti, however, we quickly discovered that we did not have sufficient resources to estimate mortality and morbidity through MSE, particularly in light of the extensive damage to the country's infrastructure, which made travel difficult. Weighing our options, it seemed feasible to conduct an RDD survey. Based on some research published before the earthquake, we discovered that, while almost no landlines exist in Haiti, mobile phone penetration is quite high, especially given the relative poverty in which the people of Haiti find themselves. Widespread poverty and a small upper class allowed us to operate under an assumption that coverage error would lead to a slight but acceptable coverage bias. Finally, an MPO survey would drastically reduce our costs. Considering the amount of rubble and traffic in the urban area roads, and the notoriously difficult rural roads, the telephone survey was an easy choice.

Once we decided on this mode, we faced an ethical challenge. Survey research organizations in the U.S. deal often with institutional review boards (IRBs), which have some oversight role when studying human subjects. Although there are no IRBs in Haiti, we felt it important to involve one nonetheless. While in Haiti, we emailed an IRB, explained our proposed survey, and asked for their guidance. One concern involved the possibility of undue emotional burdens on respondents so soon after the earthquake. Typically researchers do not want to make respondents relive traumatic events to avoid triggering some posttraumatic stress. Not having an interviewer physically present to address any emotional response meant that we would have to change the focus of the survey.

We decided that a survey with two main goals – identifying the changes in household composition and employment status – would be valuable to the community of governments, aid organizations, and non-governmental organizations without causing undue stress for respondents.

3. Questionnaire Development

As four American volunteers (only one with a Haitian background), we started with a draft of the questionnaire in English. After many iterations, we then translated the survey instrument into Haitian Creole. Finally we back-translated into English as a quality control check on the translation into Haitian Creole. Although this practice of "round-trip" translation is quite common in questionnaire design, it might not be the best method. New research suggests that multiple translations from original language to the local language may yield higher quality translations. Any discrepancies between the independent translations would need to be resolved by expert translators.

A few concepts caused us to pause and reflect on how they would be interpreted by the respondent. We suspected that the terms "household" and "employment," which are

relatively straightforward to explain to a respondent in the U.S., could be confusing to Haitian respondents. Especially considering the number of housing units destroyed, how would Haitians think about the definition of household? After much deliberation and many revisions, we decided on the following: "For the purpose of the survey, your household includes anyone who shares your cooking pot including extended family members and friends." This definition, crafted not by the four foreigners, but by the two Haitian survey supervisors, was broad and consistent with a Haitian cultural context. The question of employment also posed a problem. In Haiti, the informal economy is vibrant. There are many street vendors and stores operating off the front porch of a family's home. There are many who work a few hours a day, a few days a week, a few weeks a year. How do we consider employment in these situations? In the end, we defined (again with guidance from our Haitian supervisors) employment as "engaged in gainful activities that provide money for your household's daily expenses." These definitions were revised further based on feedback from our pilot test.

A final aspect of the questionnaire design is worth noting. We nearly went into our pilot test without a single open-ended question on the instrument. One of the statisticians on the team felt very strongly about including at least one open ended question so respondents could express themselves more freely and researchers could gain insights beyond those provided by answers to the explicit questions asked. This afforded us great insight into the respondents in our pilot test and helped us craft better training tools for the full study. For example, we were able to anticipate that many respondents would ask what further assistance our organization would be providing (beyond the incentive), and we trained our interviewers to give a standardized honest, yet sympathetic, reply.

4. Cooperation Incentive

Often in RDD surveys, respondents receive token incentives in the mail shortly after completion of the survey. This method works well in the U.S. where the postal system is quick to deliver mail and respondents have stable and well-formed addresses. We were concerned that it would be difficult, if not impossible, to get incentives to respondents by postal mail in Haiti. However, in our discussions with telephone companies, we learned that it was easy to apply phone credits to respondents' mobile phones from those used in the survey. This made for an optimal solution: an incentive that was useful, instant, and relevant.

The incentive was as useful as cash. We were convinced from our discussions in the pilot test that respondents (who all had mobile phones, of course) would be equally happy to have phone credits as they would to have cash. The credit was delivered quickly to the respondent's mobile phone mere hours after completion of the survey. In the full sample, this would have been administratively time consuming, but one of the telephone companies graciously offered to apply incentives in batches if we provided the phone numbers. We were sure to obtain permission from the respondents before sharing their phone number with the telephone company. Finally, the phone credit incentive was relevant. What better incentive for an MPO survey than mobile phone credits?

It's important to point out that an MPO survey was workable because of the structure of the phone system in Haiti and the situation in other countries may not be similar. For example, in Europe, survey costs are increasing because a greater percentage of the

population uses mobile phones and it costs more to call a mobile phone than it does to call a landline. In the U.S., the interviewer and mobile phone respondent both pay for the call. This has multiple implications: researchers are forced to offer larger incentives to offset the costs to respondents. Also, caller ID is a hurdle for researchers in the United States. If respondents do not know the number, they may not answer the call to avoid even a minimal charge. In Haiti, the respondent does not pay for the call. We believe that this cost structure helped our response (quite likely both the contact and cooperation) rate. The cooperation rate for the full study was about 95%.

5. Further Research

If funding is found to replicate this survey, a few points of further research may be entertained. First, would inclusion of text messages as a method of advance notification aid in improving the contact rate or in determining which numbers are working? This is a method that has been tried in Europe and shows some promise. Along similar lines, could a token pre-paid incentive be applied to all of the randomly sampled phone numbers to determine if a phone is working?

6. Conclusions

Based on the results from the full study of nearly 800 respondents, we feel that an RDD MPO is a promising method of data collection in post-disaster situations in the developing world with high mobile phone penetration rates and similar fee structures.

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