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Research Note

Adapting social surveys to depopulating neighborhoods

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ABSTRACT

Survey research is an essential method for understanding if and how landscape interventions provide socio-ecological benefits in residential areas. However, depopulating areas present challenges to methodological conventions for household surveys. We describe the innovative modified approach we used to survey a Detroit neighborhood with high residential vacancy and ongoing depopulation. We conducted household surveys (n = 164) to assess baseline health information, perceptions of neighborhood characteristics, and design preferences related to alternative green infrastructure interventions. Specifically, we describe the iterative decision-making process we used to determine our area frame, identify and contact households, and monitor survey response – a process that led us to a census-based approach. This entailed ongoing assessment of household vacancy in our study neighborhood, using secondary data from multiple sources, tracking household visits during survey administration, and soliciting ongoing input from survey administrators. The iterative process we developed may be informative to others conducting household surveys in depopulating neighborhoods.

1. Introduction

Cities worldwide are exhibiting depopulation driven by economic disinvestment, aging populations, declining birthrates, migration, and social and political conflict (Dewar & Thomas, 2013; Haase, Haase, & Rink, 2014; Martinez-Fernandez, Kubo, Noya, & Weyman, 2012; Nassauer & Raskin, 2014). As a result, many neighborhoods within these cities are characterized by vacant properties, including abandoned structures and lots. To support human well-being in such neighborhoods, there is a need to understand residents' experiences and preferences for landscape change. Here we describe several adaptations of standard survey research methods used to obtain more complete representation of residents in depopulating neighborhoods.

Systematic household surveys are an essential tool for understanding residents' knowledge, preferences and attitudes (Groves & Couper, 2012). Area probability sampling is arguably the most widely accepted approach to achieving valid, reliable and generalizable survey results (Comey et al., 2013; Hildner, Oo, & Tatian, 2015). This approach begins with the identification of an area frame (i.e., a geographically defined area of interest) (Kennel, 2008). Typically, a sampling frame within the area is selected next (e.g., random selection of households in area frame to contact and complete survey) to achieve a representative sample reflecting underlying population characteristics (Hall, 2008). However, in studies of depopulating neighborhoods, uncertainty about the number and distribution of unoccupied homes, and informal occupation of some 'vacant' homes, may significantly complicate identification of these frames.

Few household surveys have sought to understand residents' perceptions of highly vacant neighborhoods (e.g., Morckel, 2015; Ward Thompson, Roe, & Aspinall, 2013), and these have not reported survey methods in sufficient detail to describe how or if their methodological approach accounted for:

- A high proportion of vacant residences,
- Dynamics of depopulation (i.e., vacancies occurring after official occupancy lists have been compiled from postal or other sources), and
- Officially unoccupied residences, with uncertainties about whether residences that are identified as vacant by official sources actually might be occupied.

We accounted for these characteristics of depopulating

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neighborhoods when we conducted a survey to assess resident responses to alternative green infrastructure (GI) landscape designs in a depopulating neighborhood of Detroit, MI, USA. In Detroit, like many other post-industrial cities, widespread residential vacancy has resulted largely from tax and mortgage foreclosures related to historically discriminatory policy processes (Foote, Gerardi, & Willen, 2008; MacDonald & Kurth, 2015; Ross & Squires, 2011). These processes also triggered complex and converging issues over the last half-century, including loss of industry and employment, race-based and income-based segregation, and a reduced tax-base to support city services and infrastructure (Deng, Seymour, Dewar, & Manning-Thomas, 2017; Sugrue, 2014). Below we describe how we addressed related population dynamics when we identified area and sampling frames and how our decision to conduct a census of the area was key to representing residents that might have otherwise not been surveyed. We describe our iterative, adaptive approach to conducting household surveys, which included: using multiple secondary data sources, employing local residents as survey administrators, and learning from field observations and insights of our survey administrators.

2. Characteristics of our depopulating study area

We conducted this survey as part of transdisciplinary research including the Detroit Water and Sewerage Department (DWSD). DWSD selected this neighborhood for future GI construction consistent with their comprehensive Green Stormwater Infrastructure Plan (DWSD, 2014), which established a goal to reduce sewage overflow at 17 specific outfalls in the Upper Rouge Tributary. Our study area is located in this watershed in a neighborhood where vacant publicly-owned land could be made available for the construction of GI for stormwater management. Since this proposed construction would change the neighborhood landscapes, with environmental, social, and public health implications, there was a need to understand residents' preferences for GI. To contribute to both broader scientific knowledge and local decision-making, we used rigorous methods to ensure accurate representation of the study population, Detroit residents living nearby proposed GI landscape changes.

Overall, Detroit lost 24.5% of its population from 2000 to 2010, with an additional 4.7% loss between 2010 and 2014 (U.S. Census, 2015). Between 2000 and 2010, as depicted in Fig. 1, household vacancies in our study area increased by 301.2% or more than fourfold from 519 vacant units to 2082 vacant units. Table 1 reflects resulting demographic changes during this period, wherein the number of owner-occupied properties decreased by 36.7%, and the population fell by 16.5%. The number of residents identifying as African American increased by 15.3% and those identifying as white decreased by 51.1%. Median household income fell by 50.1%, while unemployment increased by 198.9%.

3. Area and sampling frame adaptations to account for vacancy

The area frame for our study encompassed households near sites where GI would be constructed later in 2015. Here we describe our steps, an iterative adaptation of a generalized sampling process (Kish, 1995) in which multiple data sources, including our survey administrators, informed our census approach.

3.1. Calculate sample size

To calculate the desired number of completed surveys, we considered the study budget and timeline, and conducted a power analysis (i.e., calculation to ensure sufficient statistical power to note significant effects across treatments) (Coffey, 2010). We determined 160 completed surveys would provide sufficient power to detect significant effects when exploring relationships between GI design alternatives, preferences, and perceived impacts, our primary outcomes of interest. For instance, we needed to ensure sufficient power to test associations between demographic factors, resident preferences for GI design, anticipated impacts of GI on mental health, physical activity, social interaction with neighbors, neighborhood safety, and other indicators of

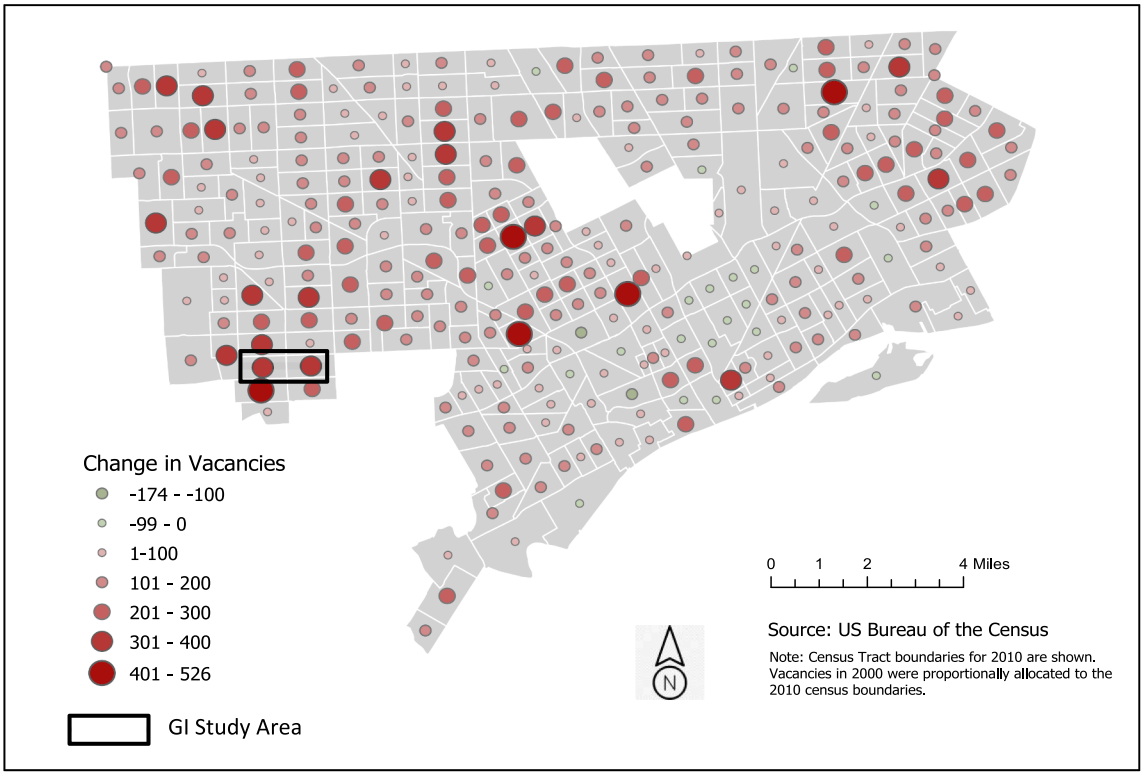

Fig. 1. Change in residential property vacancy by census tract, including research study area – Detroit, MI 2000-2010.