New Orleans Healthy Neighborhoods Project

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Protocol

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BACKGROUND

Violence is a leading health burden in the U.S. and globally, and plays a significant role in shaping population health and health disparities.[1] Firearm violence has been increasing over the last decade and its rate in the U.S. is estimated to be larger than that in any other developed nation.[2-4] Youth violence is especially troubling given that patterns of violence often begin in childhood, with fatal violence resulting in significant healthy years of life lost.[5] Homicide is the 2nd leading cause of death for youth 15 to 24 years old, killing an average of 13 young people ages 10 to 24 *each day* with the majority of cases (83%) being firearm homicide.[6] Non-fatal injuries sustained from physical assaults, school violence, intimate partner violence (IPV), and child maltreatment occur with a prevalence that is many times higher than their fatal counterparts.

Although there is a growing evidence-base to prevent youth and family violence (e.g., school and family-level interventions), there remains **a fundamental gap in evidence addressing the more serious forms of youth violence as well as evidence of effective population-level interventions** that may impact both fatal and non-fatal violence. Remediation of abandoned buildings and vacant lots is potentially an effective and cost-beneficial solution to violence in U.S. cities.[7-9] This place-based intervention may be an effective population-based strategy for primary prevention of serious and lethal violence among youth but our preliminary observational studies of urban vacant and abandoned property remediation have been the only ones to explore this approach specifically among youth and for violence in the home, including child maltreatment and IPV.[10] Vacant lots and properties in an area signal structural health challenges and remediation of such vacancy and abandonment may physically remove opportunities for violence (e.g., storage of illegal weapons in these areas), increase residents' trust-building interactions with each other, and enhance their willingness to enact social controls and intercede on violent behavior.[11,12] No intervention trials have examined the impact of vacant and abandoned property remediation on youth and family violence, although research on other forms of neighborhood disorder and the nature of family violence suggest that it could have a substantial impact.[13] There is an urgent need to correct this gap in knowledge and expand our efforts with practical interventions, such as vacant and abandoned property remediation, that impact the public health crisis of youth and family violence and that can be readily scaled for application in multiple cities.

Furthermore, **local neighborhoods are an essential context for shaping health and well-being and for creating a societal commitment to health and health equity**. Characteristics of the built neighborhood environment (an RWJF E4A Action Area 3 Driver - https://www.rwjf.org/en/cultureofhealth/taking-action.html) have been associated with Action Area 1 Drivers such as sense of community and civic engagement, but few studies have examined *changes* in built environment conditions on such Drivers. Neighborhood change could be a catalyst that engages residents to see the connections between conditions in our community and health, increase community cohesion for health and social change, and may be one scalable tool for making health a shared value.

I. Project Summary

This cluster randomized trial tests the impact of vacant and abandoned property remediation on two sets of outcomes: 1) youth and family violence and 2) well-being and heath interconnectedness, sense of community and sense of safety, and civic engagement. The central hypothesis for the first set of outcomes is that vacant and abandoned property remediation will reduce violence by providing fewer locations for illegal weapons storage, improving residential sense of community and social control, and reducing perceived stress among residents. Our central hypothesis for the second set of outcomes is that vacant and abandoned property reduction will improve health and well-being by improving residential sense of community and social control, sense of safety, and will increase engagement and awareness of the link between community conditions and health by residents. These hypotheses are based on our previous findings linking community and family violence and health and well-being with other structural neighborhood conditions,[7,14-18] as well as the collaborative efforts of our interdisciplinary team and strong community partnerships.

The proposed RCT is a 3-arm intervention: 1) parcels without buildings/structures and greened only; 2) parcels greened + buildings/structures treated; 3) control lots across four New Orleans communities experiencing high rates of violence. The unit of randomization for the trial is a geographic cluster (~1/8-mile diameter) and 194 clusters were randomized through block randomization in two groups—clusters with parcels with both vacant buildings and lots and clusters with only vacant lots, based on what we were legally able to 'treat'. Within each group and within the 3 blocks, based on 3 main geographic areas of the city, there are treatment and control clusters.

II. Treatment

Lot greening consists of three phases: 1) a cleaning phase - removal of all refuse, debris and any overgrowth in designated lots; 2) a preparation phase – preparing soil and adding compost-rich topsoil, and obtaining seeds, trees, and fencing where needed and permissible, including planting of trees and placement of a modest post-and-rail or bollard fence around the lot; and 3) a maintenance phase – bi-weekly mowing and cleaning during growing season. Technical guidance will be provided from the City of New Orleans. Bollard fencing includes installation of dome-top 6-7/8" diameter pressure-treated pine bollards 6'3" long, approximately 5' OC, approximately 36" of the bollard shall be above ground elevation. Post-and-rail fencing follows a previous protocol.[19] Bollards are installed direct-buried. No concrete foundation is required. Sand shall be used to fill in around bollard in augured hole. All of the loose dirt generated from each augured hole is disbursed/spread on the same work site property. The bollards are installed approximately 5' apart on each property, but no more than 6' apart and no less than 4' apart.

Building/structure treatment also consists of three phases: 1) a cleaning and preparation phase – removal of any trash or items on (e.g., porch) or around the structure, removal of broken or boarded windows, and preparation for painting; 2) a treatment phase – installing new windows and applying paint where applicable; and 3) a maintenance phase – bi-weekly checks during greening maintenance and replacement of any windows as necessary. Costs will vary depending on the size of the structure and some structures will potentially need demolition, which will be explored.

III. DATA COLLECTION

Data collection is taking place from January 15, 2019 – December 31, 2023 (estimated) and will involve both quantitative and qualitative components.

Quantitative Design. To test the impact of vacant and abandoned property remediation on proposed outcomes and to examine causal mechanisms, a prospective cohort study of residents from intervention and control neighborhoods is being followed over a 2-year period, with survey data collected at baseline (one-year pre-treatment), 6-months, 1-3 months post-treatment, and one-year post-treatment. Data is also being collected, in the interim, through an SMS/text-based platform.

The proposed treatment of lots began in summer 2020. Recruitment of residents began one year or more (given pandemic challenges) before treatment of parcels in January 2019. Recruitment and treatment of parcels took place sequentially over the selected neighborhoods, with qualitative data also collected throughout the RCT in the selected neighborhoods. The figures below are an attempt to depict this graphically.

Qualitative Designs. To gain an in-depth understanding of the role of vacant and abandoned property remediation and other community characteristics on health and well-being, sense of community, civic engagement, and sense of safety including youth and family violence, the project also employed a qualitative research design. Beyond the factors within residents' communities, this project explores the context of the larger urban area as well as the other settings that the residents spend time (e.g., work environment, school environment).

The qualitative component engaged a large sample of the New Orleans' community through focus groups and key informant interviews to better understand the relationship between neglected and asset-based built environment conditions and their impacts on residents. By facilitating a space for residents to discuss their lived experiences and perspectives, we hope to acquire deeper insight on how the built environment can influence the prevalence of violence and additionally, how the built environment impacts residents' health, well-being, and understanding of social connectedness.

Proposed 2.5-year project data collection and treatment timelines:
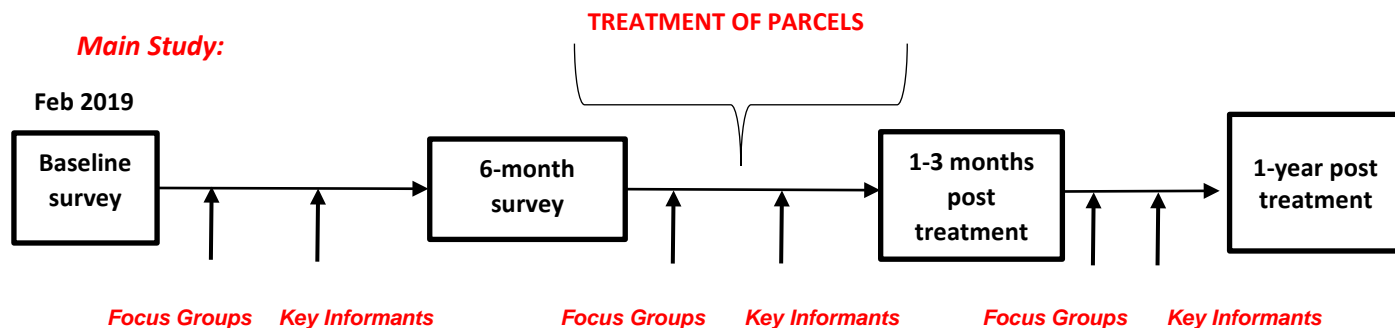
Subject Population

Participants were recruited from the 194 geographic clusters being randomized in the trial, and all residents in the clusters were invited to participate. Sampling was initially a random selection of residents in clusters but due to lower population numbers in some clusters, all residents were invited to participate, and the sample ended up a convenience sample. The study includes a residential cohort of approximately 405 participants surveyed over four waves of data collection. Data collection began in January 2019 and is estimated to continue until December 31, 2023. Focus groups and key informant respondents were recruited from throughout the city.

Data Collection

Quantitative survey data was collected through interviewer-administered surveys utilizing RedCap™. Surveys were conducted over the phone as well as a handful of surveys in person. Participants with different modes of data collection did not differ in any way according to any sociodemographic factors or in the exposures or outcome of interest in the present study. Focus groups were also conducted either at Tulane or in the community after recruiting interested residents. Key informant interviews and semi-structured and in-depth interviews were conducted either over the phone, through zoom / online, or in person. All interviews were conducted on weekdays, during working hours, and on some Saturdays.

Each participant provided oral consent to participate and was informed of their right to withdraw. The length of the key informant interviews and focus groups was approximately one hour, and residential surveys no more than 30-45 minutes. All interviewees received a $25 gift card reimbursement for their time. All qualitative questions will be open-ended to facilitate free discussion about variables important to the intervention. The focus groups were conducted by trained staff and a note taker to document strong agreements or disagreements and other social interactions within the groups. All key informant and focus group interviewers were familiar with informed consent procedures, the use of the interview guide, confidentiality procedures, and a local referral/resource guide. Interviews were recorded with consent of each participant, and each tape was transcribed verbatim. Demographic information about each participant was collected. Names and potential identifiers in the data was masked and each dataset assigned a non-specific numeric code. Transcripts were reviewed and edited by the facilitators for accuracy.

Secondary data was also obtained from multiple sources, including local crime and violence markers as well as built and social environmental characteristics. All secondary data had date and longitude-latitude coordinates or aggregate geoidentifiers available, which will be utilized to count the number of events occurring within a 1/8-mile radius around each lot as well as to calculate a kernel density estimate and interpolate the outcomes per square mile at the centroid of each lot or building or the average value in the area of a cluster for aggregate data. A distance of 1/8-mile is a common measure used in city planning as a reasonable walking distance from a location.[20]

Measures

Primary outcomes of interest will be: 1) youth violent crime rate, obtained from the New Orleans Police Department records and calculated as overall violent crime rate as well separately for homicide and assault; 2) youth violence-related non-fatal injury rate, obtained from local hospital discharge data; 3) youth violence-related mortality rate, obtained from the Louisiana Department of Health; 4) youth maltreatment rate, obtained from the Louisiana Department of Children and Family Services; and 5) domestic violence rate, obtained from the City of New Orleans 911 call data and Police Reports. Secondary outcomes will be well-being (as measured by a number of quality-of-life measurements) and health interconnectedness (as measured by markers of perceived interconnectedness and social support for health), sense of community (as measured by markers of collective efficacy and the sense of community index), sense of safety (as measured by perceptions of safety and witnessing violence), and civic engagement (as measured by local voting rates and organizational participation).

For the Wave 2 residential surveys, data collection was updated to address the worldwide and evolving "coronavirus disease 2019" (abbreviated "COVID-19) pandemic. On March 11, 2020, the World Health Organization recognized COVID-19 as a pandemic and with national social distancing policies created. The pandemic has led to severe global socioeconomic disruption, postponement or cancellation of social and cultural events, school closures, loss of employment and wages, and more. This disease poses a serious public health risk to our study participants. In the Wave 2 surveys, additional questions were added to capture the impact of the pandemic on behavioral and emotional stress as well as to capture testing and diagnosis. For instance, participants were asked about changes in life because of COVID-19, any cancellation or postponement of social/family events, experiences of job loss or incomes changes, feelings of isolation, changes in physical activity, changes in diet, and any increases in alcohol. Participants were also asked if they have been tested for COVID-19, diagnosed (positive tests), and what preventative measures they are currently taking. Research staff were trained on updated survey tools and how to respond to study participants who may have questions about coronavirus.

IV. ANALYSIS

All quantitative data is being collected in existing formats, merged and saved in SAS data files, managed, including conducting extensive consistency checks in all levels of the data. Each time these checks are completed, the cleaned data are added to the existing database for analysis. ArcGIS (v10.1, ESRI, Inc., Redlands,CA) will be utilized to estimate the outcomes surrounding intervention and control lots. Overall, the analysis will involve: (1) descriptive statistics, (2) unadjusted bivariate estimates and crude tests of efficacy, (3) regression modeling techniques [21] and spatial analyses where appropriate.

In primary analyses, the lot will be the unit of analysis and the longitude-latitude location of all outcomes will be utilized to count the number of events occurring within a 1/8-mile radius around each lot as well as to calculate a kernel density estimate and interpolate the outcomes per square mile at the centroid of each lot or building. A distance of 1/8-mile is a common distance measure used in city planning as a reasonable walking distance from a location.[20]

Expanded radii of 1/8 to 1/4-mile and 1/4 to 1/2-mile areas will also be examined. The kernel density method creates a smooth surface using a quadratic function from a set of points, in this case, youth violence locations. Each location on the new grid surface is assigned a density value, or magnitude per unit area. This method more accurately measures the magnitude of effect for point-based outcomes such as crime; the effects of a crime will be felt not just at the exact location of occurrence but also in surrounding areas. For point-based kernel density calculations, we will create 100-foot resolution grids representing kernel density of outcomes based on the specified radii. We will also calculate block group estimates where we will link outcome counts to block group centroids and used the standard error to create inverse-distance weighted (IDW) measures at each site (using a cell size of 100 feet and search radius of 12 points). The IDW method also creates a smooth surface by interpolating values assigned to points.

To estimate the effect of vacant and abandoned property remediation on youth violence outcomes, we will regression models that compare changes in outcomes before versus after remediation for: (1) building treatment compared to control lots, (2) greening compared to control lots, and (3) building treatment compared to greened lots. We will assign treatment dates to controls so that each comparison will be followed for the same period of time. Poisson random-effects regression models in SAS GLIMMIX will be used to estimate the impact of remediation on youth violence outcomes (Y) with a model framework:

$Y_{it} = \beta_0 + \beta_1*(Intervention) + \beta_2*(Time) + \beta_3*(Intervention*Time) + \beta_4*(Neighborhood) + \varepsilon_{it}$

Where i is the lot; t is time; Intervention is a 3-category variable denoting intervention group assignment; time will be modeled as month, based on the start or 'enrollment' for each lot; Neighborhood is a 4-category variable representing the 4 areas of the city from which lots were selected; and ε is the residual error. The month year will also be modeled to control for any secular trends. Potential block group level confounders will be included as needed based on examination following intervention and control matching. Where possible, individual-level data on race, ethnicity and sex will be examined and utilized in analyses as potential effect modifiers. The primary test of treatment efficacy is β_3 or the impact of vacant and abandoned remediation over time between intervention versus control groups, comparing within matched pairs. Re-categorization of the group assignment referent will also allow comparison between building treatment versus greening only lots.

P-values less than 0.05 will be treated as a significant effect, with a lower p-value used to account for multiple testing issues given the multiple outcomes. We will calculate the Incidence Rate Ratio (i.e., the ratio of outcome counts per square mile at the treatment site to that of the control site). In addition, we will calculate the expected change in the number of outcome events around the treatment sites due to remediation.

Qualitative and Intercept Survey Data Analysis. The qualitative data will be stored in Microsoft Word. NVivo qualitative analysis software (QSR International, Version 10), will be used to manage and analyze the qualitative data. Qualitative data analysis will be used to analyze themes related to all Aims. After the first key informant interview and focus group have been completed, the research team will independently review transcripts, making notes of major themes.[22] These themes, along with field notes recorded following focus groups, will form the basis for development of an initial codebook. Using NVivo, the research team will code and each transcript will be independently coded by two people. The team will meet to discuss coding decisions, adjudicate differences, and establish an expanded codebook with primary code

categories and sub-themes within each category. The team will continue to analyze transcripts on an ongoing basis with regular meetings to review coding and resolve differences. Alterations will be made to the codebook when all researchers agree that a new theme has emerged. Codes will be refined and collapsed as needed. Major themes will then be compared across community leaders and residents. Pre-post intercept surveys will be analyzed in SAS using basic descriptive analyses to examine proportions and change in proportions.

V. DISSEMINATION

The foundation for our dissemination strategy will be built upon a Knowledge to Action (K2A)[7]-centered plan for translation and dissemination initiatives—and aimed at all levels of the Spectrum of Prevention (SOP), as demonstrated in the table below.[23] Our three-pronged strategy for success begins with leveraging our interdisciplinary team's *existing* network with local, regional, and national partners while continuing to build *new*, unique interdisciplinary partnerships. Second, we will build upon our distinctive *interdisciplinary strengths*——and community connections to translate results to diverse audiences. Third, our efforts will integrate findings from our own and other cutting-edge, rigorously-evaluated research strategies designed to inform community-based structural interventions to change mindsets for health. We will utilize existing partnerships within the City of New Orleans, including their Neighborhood Engagement Office; the Tulane Violence Prevention Institute (violenceprevention.tulane.edu).
　　　The strategy of our translational activities will center on the Center for Disease Control and Prevention's (CDC) K2A Framework,[7] which identifies three phases in the overarching processes of moving from scientific discovery to routine public health practice: research, translation, and institutionalization. To engage partners in increasing translation of research into practice, selected community stakeholders and dissemination and translation partners are part of a Community Action Board (CAB) that meets bi-annually, as well as to hold a series of community conversations to contribute substantial input into the implementation, dissemination and translation of findings. These translation partners can serve to advocate for policy and systems change based, disseminating information to their own partners and target audiences. Through our dissemination activities, we will have the ability to bring a translational lens to partners and include components that will aid in later translation or implementation in other settings using the K2A framework. To create a dissemination platform, we will systematically use the K2A Dissemination and Engagement Checklist to plan for dissemination and engagement processes to ensure the appropriate materials are targeted to interested organizations and individuals. As detailed above, the dissemination of information via the existing partner websites will be designed to highlight the most pertinent evidence-based solutions available from the scientific community, as well as our own collaborations with local community, regional and national partners.

VI. REFERENCES

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