The Effect of Stable Housing on Short-Term and Long-Term Health Outcomes

Community Partner: Twin Pines Housing Trust

Roesha Andre
Ebenezer Bulcha
Rashaad Cooper
Caylin Parker
Ayub Sharif

Sociology 11: Research Methods

Dartmouth College

Word Count: 4942

The United States, although one of the most developed nations, faces a paramount challenge in ensuring stable life outcomes across its diverse population. Access to adequate housing is one of the ways that these life chances are unequally distributed. Moreover, there has recently been a 0.7% increase in the number of homeless cases (Gee 2017). This rise in unstable housing has a profound negative impact on the mental and physical health of many individuals around the nation. Fortunately, there are organizations aimed at addressing the issue of affordable housing. In this analysis, we are partnering with Twin Pines Housing Trust, a leading developer and provider of affordable housing in the Upper Connecticut Valley Region. Our goal is to investigate the relationship between affordable housing and health outcomes. Before we delve deeper into this relationship, we will highlight previous literature that helps provide a foundation for our analysis.

Homelessness Conceptualized

First, we will need to discuss how academia conceives homelessness. Researchers have documented three major types of homelessness: temporary, episodic, and chronic (Lee 2010). Twin Pines Housing primarily focuses on the needs of the chronically homeless population. Second, there are several factors that lead to homelessness. Homelessness is a product of a conjunction of unfortunate circumstances – a combination of macro-level and micro-level factors (O'Flaherty 2004). On one hand, there are macro-level factors including, but not limited to, economic conditions, demographic trends, and policy shifts (Lee 2010). On the other hand, micro-level factors include personal vulnerabilities, institutional experiences, and situational crises (Lee 2010). Moreover, lack of access to affordable housing and insufficient mental health resources are two of the biggest determinants of high levels of homelessness (Elliott and Krivo 1991). Lastly, when touching on the demographic breakdown of the homeless populations -

families and children are the fastest growing segment of the homeless population (Jackson and McSwane 1992). Twin Pines allocates considerable resources to serving the needs of families and children, an area of interest for this community partner.

The Effect of Homelessness on Health

As previously mentioned, insufficient mental health resources are a contributing factor to homelessness. It is important to note that there is a quasi-cyclical relationship between housing and health. Lack of adequate health resources has economic implications and can lead to unstable housing conditions, and more importantly, many homeless people suffer from chronic issues such as mental illness, alcoholism, physical disabilities, and overall poor health (Shlay and Rossi 1992).

Homelessness complicates every step in the wellness process. The conditions of homelessness affect an individual's ability to maintain their health, access treatment, and recover from illness (Jackson and Mcswane 1992). Moreover, the effect of homelessness can vary depending on how often an individual lacks stable housing. The newly homeless struggle under the combined pressures of residential instability and significant levels of physical disease (Schanzer 2007), while those who were chronically homeless were more likely to self-report substance abuse problems, any mental health problems, and bipolar disorder (Creech 2015).

Benefits of Affordable Housing

Although there are profound negative impacts from homelessness, there are avenues of hope stemming from assistance programs. Housing assistance policies have improved the mental health for children and adolescents by increasing housing quality, stability, and affordability (Fenelon 2018). Moreover, we must note that investment in housing extends beyond brick and mortar infrastructure by touching on how individuals live in and experience neighborhoods

(Shaw 2004). The culture of a given community helps determine social norms which have the potential to perpetuate behaviors and attitudes that lead to homelessness. Twin Pines makes a concerted effort to provide more services beyond affordable housing to uplift their residents. Furthermore, residential assistance programs have previously contributed to a significant decline in the number of homeless cases, reduction in criminal activity, and an improvement in individuals' health conditions (DeSilva 2011).

Challenges of Studying Homelessness

Given that we are studying an extremely disadvantaged population, there are many challenges that leave a gap in the literature surrounding affordable housing. The immense challenge that researchers face is the difficulty of gaining information on homeless individuals. There is a stigma associated with homelessness which leads many to minimize the severity of their living conditions and reject assistance from researchers or organizations committed to serving their needs (Deforge 2004). Another challenge is the diversity of the population that requires housing assistance. Health and well-being, financial stress, and housing satisfaction outcomes are experienced differently by various low-income individuals who receive housing assistance (Baker 2013).

Twin Pines Housing Trust provides a unique opportunity to apply the methods found in previous literature. Through partnering with this organization, it will be possible to access and study a set of homeless individuals provided we get their consent to participate in this study. Moreover, Twin Pines Housing also focuses on affordable housing in a specific region within the country, so our results would be unique to better understanding as well as serving the needs of this particular disadvantaged population. Furthermore, Twin Pines has been serving the Upper

Valley since 1990 so they have the infrastructure and established name recognition to best conduct this study.

RESEARCH QUESTION

The present study seeks to determine the impact of housing offered by Twin Pines on the health of re-housed individuals. The existing literature determines that health and housing conditions share a well-established causal relationship. Furthermore, we look to employ the methodologies used in other existing studies and apply them to a new target population-- residents of the Upper Valley occupying unstable housing. More applicable to our community partner: do the stable housing conditions offered by Twin Pines offer health benefits to its residents?

METHODS

Overview

The data for our study will be derived from a series of quantitative surveys conducted with consenting Twin Pines program participants (**Appendix B**). When looking to determine what specific method would best evaluate the causality between health and housing conditions, deciding upon a panel study seemed the most advantageous-- the longitudinal design of the panel study allows researchers to track changes over a period of time in the self-reported data discovered from the multiple surveys, allowing for a proper determination of causality.

Furthermore, it was determined that candidates currently on the Twin Pines housing waitlist would provide the most significant results once eventually housed. Potential housing candidates on the waitlist have proven to be subject to unstable housing conditions, therefore, after moving them into stable housing conditions within the Twin Pines program, they would

ideally demonstrate an increased amount of health benefits. Current program participants may display positive health benefits but to a lesser degree than those studied upon acceptance into the program.

With currently 128 applications on the waitlist, as described by our community partner, the growing list, unfortunately, appears stagnant with little-to-no variability. However, as the construction of the Wentworth Community Housing project is estimated to be complete in the summer of 2019, there will be an influx of 30 waitlisted applications accepted into the housing project. The expected inflow of accepted applications is ideal for this study. This study can also be conducted on current residents in a possible test-flight program to ensure the existing framework exists to proceed with the summer. The test-flight program can also be used immediately on current residents to draw data more promptly; however, recall those already housed within Twin Pines will display fewer health benefits than those moving off the waitlist.

Lastly, prior to continuing to the methods, please note the survey was created using existing studies and by undergraduate students. The contributing 5 students are enrolled in a sociology course titled *Research Methods*, instructed by Professor Kimberly Rogers. Collaborating with a community partner, here Twin Pines Housing Trust, and addressing the proposed **research question** (covered in the previous section) is the term project for the course.

Advantages & Disadvantages

Some potential advantages of utilizing the chosen method are:

1. The longitudinal study would over time be able to display the causality between health and housing.
2. Structured interviews offer the researcher the ability to answer clarifying questions, leading towards more accurate answering from respondents.

Some potential disadvantages of utilizing the chosen method are:

1. The accuracy and furthermore the reliability of self-reported claims on health
2. In order to draw a compelling case for causality, the case needs to be extended over a long period of time as health changes gradually change over time.
3. The cost associated with running a two-year study may grow steep.
4. There could be a self-selection bias because program participants that choose to take the survey might have potential reasons that they want to speak out about their physical and mental health.

Following this analysis, we have identified the advantages of utilizing structured interviews as a means of effectively gathering data considering the demographic being studied. As poverty and education often share an inverse relationship-- the less educated an individual is, the more likely he or she is to be in poverty-- the program participants likely may not be able to read or fully comprehend certain jargon (Mueller and Tighe 2007). To avoid this, the structured interview would be communicated face-to-face with fixed questions, allowing for clarifying questions. As the name would suggest, face-to-face interviews involve direct in-person contact between interviewer and interviewee. The disadvantages of face-to-face interviews within panel studies are both the high cost associated with the long-term study and the interviewer's time contributed. In this case, the researcher will employ a panel study following the consenting Twin Pines program participants recently admitted off the waitlist for two years, administering the survey every six months beginning with a preliminary survey at the start to act as a base-point. The subject will have been surveyed five times at the end of the two years. Moreover, while face-to-face interviews are frequently conducted incorporating computer-assisted personal interviewing (CAPI), due to concerns that a subject may not know how to operate a computer,

we've decided upon only allowing the subject to record his or her responses on paper. The resources and time needed to sustain the study throughout this period is the most glaring disadvantage of the study's methods.

Other methods considered for the study were telephone interviews and paper-and-pencil questionnaires. The advantages of telephone interviews are the substantial savings in time and cost, relative to face-to-face, as well as the allowance for centralized administration and control. The disadvantages, however, are that telephone interviews lead to higher nonresponse to questions, lower response rates for participation altogether, and more difficulty in drawing a simple random sample, all relative to face-to-face. As for how paper-and-pencil questionnaires compare, they are less expensive than both of the previously mentioned methods, more accessible than interviews, and most notably, more shielding of privacy, allowing for sensitive questions. However, the disadvantages of this method far outweigh the advantages as paper-and-pencil questionnaires tend to have lower participant response rates as well as higher nonresponse to questions, all relative to face-to-face once again; the method's most critical disadvantage, especially within our study, is that it offers no opportunity to clarify questions or probe for answers. While there is no perfect method, conducting the panel study using face-to-face interviews proves to be the most advantageous.

Approach

Since structured interviews are deductive, our approach towards collecting data is quantitative. Analyzing the survey responses over the duration of the experiment, changes in responses to the fixed questions would be recorded. To more easily view the variability in responses, we've resolved to develop a coding scheme. Given all questions asked on the survey will offer response options as none are open-ended, for example, option-one would be coded as

1, option-two as 2, and so on for every single question asked on the survey (**Appendix C**). The researchers would then plot responses on a spreadsheet for each of the five trials to ultimately analyze trends in response variability to either prove or disprove causality.

Variables

In structuring the design of quantitative research, the variables being studied have to be explicitly identified. The independent variable being manipulated in our research is housing conditions and the dependent variable is health. Housing conditions are conceptualized in this study using both New Hampshire's (RSA 48-A:14) and Chapter 6 of Vermont's Rental Housing Health Code due to Twin Pines spanning both states (**Appendix D and E**). As the purpose of both the codes align in that they intend to protect the health, safety, and well-being of the occupants of housing, establishing minimum health and habitability standards that all residences must meet, they share similar standards. Whichever of the two states the program participant being surveyed resides in will determine the housing code standard used. In the case of the Wentworth Community Housing project, Chapter 6 of Vermont's Rental Housing Health Code would be used to conceptualize housing conditions given the property is in White River Junction, Vermont. As housing conditions act as the independent variable in our research, it is operationalized through the introduction of Twin Pines housing programs; admittance off the waitlist correlates towards a shift from unstable housing conditions to stable.

In the study, the dependent variable, health, was conceptualized using Jennifer Ruger's Healthy Capability Profile (**Appendix F**). Conceptualizing health using the framework of an existing study was identified as a viable option as neither the researcher(s) conducting nor students developing the study are likely to have any medical experience. Within the Healthy Capability Profile, we will primarily focus on section-I "Internal Factors" part-A "Health status

and health functioning". Within this portion specifically, measures of self-reported health functioning (e.g. SF-36, mental functioning, and physical functioning) should be noted (**Appendix F**). As earlier mentioned, health is operationalized in this study using self-reported surveys. We will avoid questions asking the subject to self-diagnose without consultation from a medical practitioner as those responses would be susceptible to skepticism. We instead opted to use questions such as inquiring on the frequency of primary care visits versus emergency room visits, for example. All visual aids and following verbal explanations of how housing and health are to be conceptualized throughout the research should be presented to the interviewee prior to beginning the survey (**Appendix D-F**).

Causality

We hypothesize the relationship between the two variables is causal-- as housing conditions improve, the respective individual's health should improve as well. Causality within this design can be determined with a thorough analysis of the survey responses. At the end of the study, the panel study results, recorded on the spreadsheet, should comprise an analysis of a particular individual's responses to the five identical series of questions spread over the two-year period. If the respondent's answers change over the duration of the study to reflect a positive development in health, then it can be determined that positive causality is present. This would be the case because the positive manipulation of the dependent variable, housing conditions, positively affects the dependent variable, health. When analyzing the data, it is essential to confirm statistical significance to verify that the association between the two variables did not occur by chance; simply running the study with multiple subjects will help prove this.

Sample

Our survey's target respondents are Twin Pines program participants ideally coming off the waitlist. As earlier mentioned, with the Wentworth Community Housing project to be completed in the summer of 2019, each of the thirty accepted applications will be sent a follow-up letter requesting participation in the study (**Appendix G**). The letter will essentially describe the purpose and intent of the research as well as communicate details of what participation in the study would entail-- i.e. time commitment. The letter will also communicate that all personal information obtained during the duration of the survey will be handled as confidential data. Rather than names, we will use codes to identify the data/responses and the subject's identity. Due to the personal and sensitive nature of the topic being studied, ensuring that the data remains confidential is a priority of the researcher.

The sample population would be selected using non-random probability sampling as all thirty accepted applications would receive the invitation to participate in the survey. Thirty invitations with prepaid postage included would be mailed to the head-of-household responsible for filing the housing application. If the invited candidate agrees to participate in the survey, he or she would initial the designated area and mail the response sheet using the prepaid postage envelope attached. We decided upon this sampling method as we are more interested in determining causality and proof of effectiveness than drawing generalizable data. Non-random sampling also increases the likelihood of securing more survey volunteers as all thirty will be invited to participate, strengthening the statistical significance of our results. While thirty invitations are being sent out, we do not anticipate thirty individuals expressing interest in participating in the study as some may simply be unwilling to commit the time necessary. Random probability sampling would further decrease this number.

Another option for our community partner, on top of running a mass study for the new Wentworth Community residents, is to run a test-flight program on some of their existing tenants, particularly in their most recent project. The newly completed Parkhurst Community Housing project is a three-story building with 18 one-bedroom apartments constructed explicitly for the chronically homeless and extremely low income. Despite the residents already being housed in the property, we would ideally see drastic health benefits present due to all residents coming from chronically homeless conditions. Chronic homelessness, categorized as extremely unstable housing, is understood as the condition in which a person resides in a place not meant for human habitation, for example living on the streets. Moreover, as the Parkhurst residents were only recently housed this past summer (June 2018), they will likely still be experiencing health benefits that could be recorded as part of our data. Twin Pines can also choose to survey new program participants moved into other housing projects, but they should note that abiding by the six-month survey schedule, administering the survey a number of times on arbitrary dates, reflecting the start of a given subject's initial survey, can easily cause confusion and complicate the study. Twin Pines can also choose to use data recorded from the initial trial to display the health statuses of its occupants. This wouldn't necessarily display changes in health or make a case for causality, but the cross-sectional approach can serve as an option toward receiving immediate support from government entities, making a case for additional grants to bolster the housing trust's capital campaign.

Generalizability, Reliability, and Validity

The generalizability of our study is a recognized weakness because of our use of non-random sampling. In deciding to offer invitations to participate in the survey to all new (and relatively new) program participants, following acceptance into the program, we introduce a self-

selection bias while also eliminating the ability to generalize our results. Our ability to produce a probability sample is hindered due to the demographic being sampled as we are unable to draw a proper pool of homeless people to randomly select from given the lack of documentation. Nonprobability sampling, used in qualitative studies, is often utilized when studying homeless people. We also recognized reliability as being a weakness of the study given that since health is being self-reported, the data produced may not be entirely reliable as only medical practitioners would be able to accurately diagnose one's health. Unfortunately, incorporating a medical practitioner to execute both physical and mental health evaluations over the two-year span would grossly increase the cost of the survey. Lastly, validity, which in qualitative research refers to the "appropriateness" of the tools, processes, and data, is identified as a strength of the research (Leung 2015). Applying a panel study to our research to display trends over a period of time properly allows for a determination of causality, appropriately addressing the research question.

The longitudinal survey acting as our research instrument will take roughly twenty minutes per trial. As earlier mentioned, the survey will be administered every six months over a two-year span, including an initial trial, totaling five trials. Each of these trials will be administered in the respective residence of the program participant being surveyed as some may have trouble accessing transportation to a fixed location. Furthermore, the data drawn from the survey will be coded and recorded on a spreadsheet. Moreover, as for analyzing the research design, there are some pronounced strengths and weaknesses associated with the execution of our study. Beginning with the latter, the primary weaknesses of our research design is that the accuracy and furthermore the reliability of self-reported claims on health may be incorrect. Furthermore, in order to draw a compelling case for causality, the case needs to be extended over a long period of time as health gradually changes over time. On the other hand, the main strength

of the study is that the longitudinal study would over-time be able to display the causality between health and housing conditions. Despite the presence of various weaknesses associated with the study, the selected research design best determines causality.

ETHICAL CONSIDERATIONS

We understand that there are various ethical issues that may arise in our research due to both the sensitive population being surveyed as well as the highly personal nature of the topic. By presenting these issues, we hope to avoid them while simultaneously maintaining the integrity of both the researchers and respondents connected to this project. Ethical considerations for this research proposal include: informed consent, assessment of risks and benefits, and the vulnerability of our research respondents.

These considerations are in accordance with the three core principles of ethical research involving human subjects, compiled in the Belmont Report as the respect of persons, beneficence, and justice. The Belmont Report concerns ethics and health care research with the goal of protecting participants in research studies. This is achieved through descriptions of ethical concerns in health care research. We plan to ensure informed consent is achieved by placing an emphasis on confidentiality for all respondents. When garnering healthcare information, it can be difficult to make sure research respondents are aware of the nature of the research as well as the true meanings of their participation and the risks that come with it. This can be achieved by ensuring respondents are provided with all information regarding the studying, checking in on their comprehension regarding the study, and ensuring their participation is completely voluntary. This connects directly to the principle of “Respect for Persons” that is outlined in the Belmont Report. We will safeguard against violations against

"Respect for Persons" by ensuring individuals are treated as autonomous agents. Should problems arise informed consent, we will ensure those with diminished autonomy [KBR3] have protection available (whether that be the utilization of a translator, witness, etc.).

We plan to ensure the assessment of risks and benefits is achieved by making sure we are prioritizing the individual before the research. If we encounter respondents who decide to withdraw from the research, they will be allowed to do so immediately, with no penalty as their acceptance into the program will not be withdrawn as a coercive measure. We do not anticipate participants facing any direct exposure to physical harm or risks. This connects directly to the principle of "Beneficence" outlined in the Belmont Report. We will safeguard against violations against "Beneficence" by respecting the decisions of our participants, maximizing any possible benefits, and minimizing any harm that may come to them. In the case that a participant didn't feel comfortable answering questions regarding his or her recent visit to the emergency room, the researcher should respect the participant's autonomy and avoid probing for an explanation. Recounting traumatic experiences, such as a visit to the emergency room, against his or her will can bring about harm to the participant and should be avoided. While skipping questions isn't necessarily ideal for the survey, it won't damage the overall design of the research, assuming all other questions were answered. Determining causality through the variability of the participant's responses can still occur, however, with one less question to measure. Moreover, due to the personal nature of the topic, respondent's may decide to drop out the study-- after having already consented to be asked questions related to health-- which would reduce the number of total participants likewise weakening the statistical significance of the findings. Ideally, this can all be avoided by effectively communicating the topic and purpose of the research in the consent form. Should problems arise regarding the assessment of risks and benefits, we will have respondents

contact Twin Pines directly at <researcher's direct contact: phone and email>. They may ask any questions about the research at any time.

We plan to best protect the vulnerability of our research respondents by using unbiased procedures to select research participants. We are aware that unstably housed populations are a particularly vulnerable group. We do not seek to take advantage of their status, but instead, wish to protect them from being connected to our research simply as a result of their housing status. "Justice" as defined within the Belmont Report refers to concepts such as "fairness in distribution" or "what is deserved", however, the term is better explained as a question-- Who ought to receive the benefits of research and bear its burdens? Within our research, the immediate benefits would be directed toward Twin Pines in the form of additional grants and other government funds, but those resources would enable the housing trust to construct more projects and better maintain its current properties, ultimately benefiting the vulnerable demographic. Additional properties are well within the objectives of Twin Pines as the current directed has called for increased expansion efforts, targeting 500 rental units by 2019. Since that claim (made in 2012) Twin Pines increased its operation from 240 units, when the previous statement was made, to currently managing 417 rentals at 19 different properties, totaling to a 177 increase within the span of six years. While our research respondents will have to bear the burden of the survey, they subsequently also benefit. Furthermore, we have also decided upon welcoming all accepted applicants to participate in the study to further safeguard against the appearance of targeting certain individuals. This consideration of "Justice" helps us avoid targeting any particular racial and ethnic minorities, socio-economic groups, or other marginalized classification. Nonetheless, it still remains difficult to avoid selecting unstably housed respondents as this group is the focus of our research. We are not selecting them for

manipulative purposes; they are being selected as they relate directly to our research question and would benefit from this research.

FEASIBILITY AND SIGNIFICANCE

In conducting background research on our community partner, we learned that the organization was formed in 1990 through the merging of two organizations-- one based in New Hampshire and one in Vermont. After joining together, the housing organization became based in New Hampshire while still maintaining services in Vermont. Our community partner representative, Michelle Kersey, explained that this was done to combine funding pools for the two states. Since both are considered small-states, they receive the minimum allotment for six-million-dollars which roughly supports five projects, according to Michelle.

Twin Pines is currently the only non-profit providing multi-family affordable housing in the region, providing housing options ranging from apartments, mobile homes, single family homes, and condominiums all of which combined currently house over 1,000 people. They are currently focused on building in locations where residents will have access to public transportation, jobs, shopping, and professional services to reduce the need for private transportation, aiming to have residents become more stable and secure in job prospects to avoid re-entry into the cycle of homelessness. Whether constructing mobile homes or houses, Twin Pines aims to 'strengthen the Upper Valley community by developing and improving affordable homes for individuals and families, and by supporting its tenants and owners'.

The feasibility of Twin Pines properly executing a two-year panel study may seem unreasonable, considering there are no trained sociologists on staff. We had constructed our proposed design around this complication, arranging the entire methods section with *simplicity* in

mind. Furthermore, no specialized training is necessary to conduct the survey as it's crafted to be easily understood by individuals lacking any formalized education in sociology. Including multiple guides in the appendix to more easily enable the researcher to reference how certain terms were conceptualized throughout the study and more. Moreover, the study is even more convenient considering the direct access to the contact information of our sample pool, obtained through the housing application. Lastly for feasibility, as the non-profit is actively seeking funding sources to grow and sustain its projects, ensuring the study was cost-effective was critical.

The proposed design adopts both practical and feasible methods in addressing the *needs* of our community partner-- funding. Non-profits typically receive funding from the general public, government, and private foundations, so in an effort to further bolster Twin Pines' pitch for grants and charitable contributions, the study seeks to determine the impact of the housing offered by Twin Pines on the health of rehoused individuals. The academic significance of this analysis reaffirms or denies whether housing and health also share a *positive* causal relationship. If the results demonstrate that as housing conditions improve, health will as well, the saliency of housing trusts, mainly Twin Pines, is then further substantiated, ideally leading to additional grants and increased charitable contributions. This would empower our community partner to expand even larger-- possibly even reaching the 500 unit mark by 2019 as the director had claimed-- servicing more people presently in unsuitable housing conditions. As mentioned earlier within the methods section, there are currently *128 applications* on the waitlist at Twin Pines. The significance of our research can possibly reduce or even eliminate that number. Real people can possibly be housed because of our research.

REFERENCES

Anon. n.d. “About Twin Pines Housing - Affordable Housing Forever.” *Twin Pines Housing*. Retrieved November 19, 2018 (https://www.tphtrust.org/about/).

Baker, Emma, Laurence Lester, and Andrew Beer. 2013. *Sage Open* 3(3):1-12.

Creech, Suzannah K. et al. 2015. “Identifying Mental and Physical Health Correlates Of Homelessness Among First-Time And Chronically Homeless Veterans.” *Journal of Community Psychology* 43(5):619–27.

Deforge, Bruce R. 2004. “Reckoning with Homelessness.” *Contemporary Sociology: A Journal of Reviews* 33(4):484-86.

Department of Health, Education, and Welfare. 1979. “The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.” *United States Department of Health and Human Services.* Retrieved November 11, 2018 (https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/read-the-belmont-report/index.html#xjust).

Department of Health. 2015. “Rental Housing Code.” *Vermont Department of Health*. Retrieved November 11, 2018 (http://www.healthvermont.gov/sites/default/files/REG_Rental_Housing_Code.pdf).

DeSilva, Malini B., Julie Manworren, and Paul Targonski. 2011. “Impact of a Housing First Program on Health Utilization Outcomes Among Chronically Homeless Persons”. *Journal of Primary Care & Community Health* 2(1):16-20.

Division of Public Health Services. 2013. “Housing.” *New Hampshire Department of Health and Human Services.* Retrieved November 11, 2018 (https://www.dhhs.nh.gov/dphs/holu/documents/hom-housing.pdf).

Elliott, Marta and Lauren J. Krivo. 1991. “Structural Determinants of Homelessness in the United States.” *Social Problems* 38(1):113-31.

Fenelon, Andrew, Natalie Slopen, Michel Boudreaux, and Sandra J. Newman. 2018. “The Impact of Housing Assistance on the Mental Health of Children in the United States.” *Journal of Health and Social Behavior* 59(3):447-63.

Gee, Alastair. 2017. “America’s homeless population rises for the first time since the Great Recession.” *The Guardian*. Retrieved October 23, 2018 (https://www.theguardian.com/us-news/2017/dec/05/america-homeless-population-2017-official-count-crisis).

Jackson, Marcia Plant and David Z. McSwane. 1992. “Homelessness as a Determinant of Health.” *Public Health Nursing* 9(3):185–92.

Lee, Barrett A., Kimberly A. Tyler, and James D. Wright. 2010. “The New Homelessness Revisited.” *Annual Review of Sociology* 36(1):501-21.

Leung, Lawrence. 2015. “Validity, Reliability, and Generalizability in Qualitative research.” *Journal of Family Medicine and Primary Care* 4(3):324-27.

Mueller, Elizabeth J., and J. Rosie Tighe. 2007. “Making the Case for Affordable Housing: Connecting Housing with Health and Education Outcomes.” *Journal of Planning Literature* 21(4):371-385.

O’Flaherty, Brendan. 2004. “Wrong person or wrong place: for homelessness, the conjunction is what matters.” *Journal of Housing Economics* 13:1-15.

Ruger, Jennifer Prah. 2010. “Health Capability: Conceptualization and Operationalization.” *American Journal of Public Health* 100(1):41-49.

Schanzer, Bella, Boanerges Dominguez, Patrick Shrout, and Carol Caton. 2007. “Homelessness, Health Status, and Health Care Use.” *American Journal of Public Health* 97(3): 464-69.

Shlay, Anne B. and Peter H. Rossi. 1992. “Social Science Research and Contemporary Studies of Homelessness.” *Annual Review of Sociology* 18(1):129–60.

Shaw, Mary. 2004. “Housing and Public Health.” *Annual Review of Public Health* 25:397-418.

Ware, John E., and Cathy Donald Sherbourne. 1992. “The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual Framework and Item Selection.” *Medical Care* 30(6):473-83.

APPENDIX A

Survey

1. How would you evaluate your overall health? Would you say you are:

- ❑ In good physical health. (No significant illnesses or disabilities. Only routine medical care such as annual checkups required.)
- ❑ Mildly physically impaired. (You have only minor illnesses and/or disabilities which might benefit from medical treatment or corrective measures.)
- ❑ Moderately physically impaired. (You have one or more diseases or disabilities which are either painful or which require substantial medical treatment.)
- ❑ Severely physically impaired. (You have one or more illnesses or disabilities which are either severely painful or life-threatening or which require extensive medical treatment.)
- ❑ Totally physically impaired. (Confined to bed and requiring full-time medical assistance or nursing care to maintain vital bodily functions.)

2. Compared to one year ago, how would you rate your health in general now?

- ❑ Much better now than one year ago
- ❑ Somewhat better now than one year ago
- ❑ About the same as one year ago
- ❑ Somewhat worse now than one year ago
- ❑ Much worse than one year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

- Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports
  - ❑ Yes
  - ❑ Limited
  - ❑ A lot
- Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
  - ❑ Yes
  - ❑ Limited
  - ❑ A lot
- Lifting or carrying groceries

    - ❏ Yes
    - ❏ Limited
    - ❏ A lot
- Climbing several flights of stairs
    - ❏ Yes
    - ❏ Limited
    - ❏ A lot
- Bending, kneeling, or stooping
    - ❏ Yes
    - ❏ Limited
    - ❏ A lot
- Walking more than a mile
    - ❏ Yes
    - ❏ Limited
    - ❏ A lot
- Walking several blocks
    - ❏ Yes
    - ❏ Limited
    - ❏ A lot
- Walking one block
    - ❏ Yes
    - ❏ Limited
    - ❏ A lot
- Bathing or dressing yourself
    - ❏ Yes
    - ❏ Limited
    - ❏ A lot

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

- Cut down the amount of time you spent on work or other activities.
    - ❏ Yes
    - ❏ No
- Accomplished less than you would like
    - ❏ Yes
    - ❏ No
- Were limited in the kind of work or other activities

- ❑ Yes
- ❑ No

- Had difficulty performing the work or other activities (for example, it took extra effort)
  - ❑ Yes
  - ❑ No

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

- Cut down the amount of time you spent on work or other activities
  - ❑ Yes
  - ❑ No

- Accomplished less than you would like
  - ❑ Yes
  - ❑ No
- Didn't do work or other activities as carefully as usual
  - ❑ Yes
  - ❑ No

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- ❑ Not at all
- ❑ Slightly
- ❑ Moderately
- ❑ Quite a bit
- ❑ Extremely

7. How much bodily pain have you had during the past 4 weeks?

- ❑ None
- ❑ Very mild
- ❑ Mild
- ❑ Moderate
- ❑ Severe
- ❑ Very severe

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

- ❑ Not at all
- ❑ A little bit
- ❑ Moderately
- ❑ Quite a bit
- ❑ Extremely

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks?

- Did you feel full of pep?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Have you been a very nervous person?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Have you felt so down in the dumps that nothing could cheer you up?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Have you felt calm and peaceful?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Did you have a lot of energy?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Have you felt downhearted and blue?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Did you feel worn out?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

- Have you been a happy person?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time

- ❑ A little of the time
- ❑ None of the time

- Did you feel tired?
  - ❑ All of the time
  - ❑ Most of the time
  - ❑ A good bit of the time
  - ❑ Some of the time
  - ❑ A little of the time
  - ❑ None of the time

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

- ❑ All of the time
- ❑ Most of the time
- ❑ Some of the time
- ❑ A little of the time
- ❑ None of the time

11. How TRUE or FALSE is each of the following statements for you?

- I seem to get sick a little easier than other people
  - ❑ Definitely true
  - ❑ Mostly true
  - ❑ Don't know
  - ❑ Mostly false
  - ❑ Definitely false

- I am as healthy as anybody I know
  - ❑ Definitely true
  - ❑ Mostly true
  - ❑ Don't know
  - ❑ Mostly false
  - ❑ Definitely false

- I expect my health to get worse
  - ❑ Definitely true

- ❏ Mostly true
- ❏ Don't know
- ❏ Mostly false
- ❏ Definitely false

- My health is excellent
  - ❏ Definitely true
  - ❏ Mostly true
  - ❏ Don't know
  - ❏ Mostly false
  - ❏ Definitely false

12. How often have you visited a primary care physician within the past six months?

- ❏ 0
- ❏ 1-2
- ❏ 3-4
- ❏ 5+

13. How often have you visited the emergency room within the past six months?

- ❏ 0
- ❏ 1-2
- ❏ 3-4
- ❏ 5+

APPENDIX B

Consent Form

TWIN PINES RESEARCH CONSENT SHEET

Title of the Study: The Effects of Stable Housing on Health Outcomes

Principal Investigator: Twin Pines Housing Trust

Phone: 603-xxx-xxxx

Email: xx@twinpines.org

DESCRIPTION OF THE RESEARCH

In order to assess the impact of Twin Pines Housing Trust, this study will seek to determine the impact of housing offered by Twin Pines on the health of rehoused individuals. We hypothesize that the health of participants will increase after having moved into the stable housing conditions provided by Twin Pines.

WHAT WILL MY PARTICIPATION INVOLVE?

If you decide to participate in this research, you will be administered the same survey every six months over a two-year span, including an on-boarding trial, totaling five separate trials. You will be expected to participate in every trial. Please keep this information sheet for your records.

ARE THERE ANY RISKS OR BENEFITS TO ME?

Twin Pines does not anticipate any risks or direct benefits to you from participation in this study.

HOW WILL MY CONFIDENTIALITY BE PROTECTED?

Researchers will be careful to protect the identities of the people in this study. They will also keep the information collected secure and confidential. You are free to withdraw from the study at any point in time.

WHOM SHOULD I CONTACT IF I HAVE QUESTIONS?

You may ask any questions about the research at any time. If you have questions, please contact me at 603-xxx-xxx. Your participation in this study is completely voluntary.

APPENDIX C

***Coding Scheme Example**

Subject Name: 003

Trial 1 (01/11/2019)

1. How often do you go to the gym?
   - ❑ Very Frequently (1)
   - ■ Frequently (2)
   - ❑ Occasionally (3)
   - ❑ Rarely (4)
   - ❑ Very Rarely (5)
   - ❑ Never (6)

2. What is your favorite pizza topping?
   - ■ Pepperoni (1)
   - ❑ Mushrooms (2)
   - ❑ Anchovies (3)
   - ❑ Sausage (4)
   - ❑ Artichoke hearts (5)

3. How important is class attendance to you?
   - ■ Very Important (1)
   - ❑ Important (2)
   - ❑ Moderately Important (3)
   - ❑ Slightly Important (4)
   - ❑ Not Important (5)

Trial 2 (06/11/2019)

1. How often do you go to the gym?
   - ❑ Very Frequently (1)
   - ❑ Frequently (2)
   - ❑ Occasionally (3)

- Rarely (4)
- Very Rarely (5)
- Never (6)

2. What is your favorite pizza topping?
    - Pepperoni (1)
    - Mushrooms (2)
    - Anchovies (3)
    - Sausage (4)
    - Artichoke hearts (5)

3. How important is class attendance to you?
    - Very Important (1)
    - Important (2)
    - Moderately Important (3)
    - Slightly Important (4)
    - Not Important (5)

Spreadsheet

Subject 003

Trial 1 (1/11/2019)			
Question	Q1	Q2	Q3
Response	2	1	1
Trial 2 (6/11/2019)			
Question	Q1	Q2	Q3
Response	4	3	4

**Please note that the panel study above was strictly used for demonstrative purposes regarding how to plot codes into the spreadsheet.*

APPENDIX D

New Hampshire's (RSA 48-A:14) [Housing Code]

HOUSING

PUBLIC HEALTH ISSUE

A growing body of evidence links housing conditions to health outcomes such as asthma, lead poisoning, cancer, and unintentional injuries, and this number continues to grow. A "healthy home" is designed, constructed, maintained or rehabilitated in a manner that supports the health of the residents. In the State of New Hampshire it is the responsibility of the local Health Officer to enforce the minimum health and safety standards set forth in RSA 48-A:14 that are specific to rental housing. In conjunction with the municipal building and fire officials, the Health Officer may respond to complaints that buildings are unfit for human habitation, and when necessary, condemn a property until the conditions have been repaired or the building demolished.

LAWS AND REGULATIONS

- **RSA 147** Nuisances; Toilets; Drains; Expectoration; Rubísh and Waste; http://www.gencourt.state.nh.us/rsa/html/X/147/147-mrg.htm
- **RSA 48-A** Housing Standards; (rental housing only) http://www.gencourt.state.nh.us/rsa/html/III/48-A/48-A-14.htm
- **RSA 155-B** Hazardous and Dilapidated Buildings; http://www.gencourt.state.nh.us/rsa/html/XII/155-B/155-B-mrg.htm
- **RSA 155-A** New Hampshire Building Code; http://www.gencourt.state.nh.us/rsa/html/NHTOC/NHTOC-XII-155-A.htm

ROLE OF THE HEALTH OFFICER

The role of Health officers in New Hampshire can vary by community and is determined by what local ordinance may be in place in addition to state statutes. Several larger communities (Manchester, Berlin, & Nashua) have property maintenance codes that they are able to enforce in addition to state statutes. For smaller communities, the Health Officer is responsible for and may be limited to enforcing RSA 48-A for rental housing only, along with RSA 147, and RSA 155-B for all housing. When facing an egregious housing situation, a Health Officer is encouraged to collaborate with the local building code and fire official who are able to enforce RSA 155-A New Hampshire Building Code and National Fire Protection Association (NFPA 101) Life Safety Codes. Together, these state statutes are strong tools towards enforcing housing standards that can protect our most vulnerable residents.

RENTAL HOUSING

A common situation is for the health officer to be called because of a dispute between the landlord and the tenant. The health officer may have a role to play in such a dispute, provided that the concerns pertain to conditions that may affect the health and safety of the residents. It is important for health officers to be impartial in their dealings with all parties, and firm in the issuance of warnings and orders. RSA 48-A allows a Health Officer upon receipt of a complaint, to conduct an investigation that a dwelling is unfit for habitation, to provide notice to the property owner, to hold a hearing and to order the owner to repair the dwelling.

In New Hampshire, RSA 48-A states that a rental property owner cannot rent a residential dwelling that has any of the following conditions:

- The premises are infected by **insects and rodents** and the landlord is not conducting a **periodic inspection** and **eradication** program.
- There is **defective internal plumbing** or a **back up of sewage** caused by a faulty septic or sewage system.
- There are exposed wires, improper connectors, defective switches, outlets or other conditions that create a **danger of electrical shock or fire**.
- The **roof or walls leak** consistently.
- The **plaster is falling** or has fallen from the walls or ceilings.
- The **floors, walls or ceiling contain substantial holes** that seriously reduce their function or render them dangerous to the inhabitants.
- The porches, stairs or railings are **not structurally sound**.
- There is an **accumulation of garbage** or rubbish in common areas resulting from the failure of the landlord to remove or provide a sufficient number of receptacles for storage prior to removal unless the tenant has agreed to be responsible for removal under the rental agreement and the landlord has removed all garbage at the beginning of the tenancy.
- There is an **inadequate supply of water,** or whatever equipment that is available to **heat water** is not properly operating.
- There are **leaks in any gas lines** or leaks or defective pilot lights in any appliances furnished by the landlord; or
- The premises do not have **heating facilities** that are properly installed, safely maintained and in good working condition, or are not capable of safely and adequately heating all habitable rooms, bathrooms and toilet rooms to a temperature of at least an average of **65 degrees F**.; or when the landlord supplies heat in consideration for the rent, the premises are not actually maintained at a minimum average room temperature of 65 degrees F. in all habitable rooms.

A legal resource that the health officer can provide to the tenant is the Legal Advice and Referral Center for Tenant Rights (LARC). This agency may be able to provide assistance to tenants in relation to what their legal rights are as tenants. Their contact information is 1-800-639-5290 or 603-224-3333.

SUGGESTED INSPECTION PROTOCOL

When a health officer or local board of health learns of a complaint or violation, they would:

1. Call ahead to notify the current tenant (if any), that you would like to perform an inspection.
2. If you would like a second opinion, bring another town official, such as the building inspector, member of the board of health or board of selectmen, police officer, fire chief or the deputy health officer.
3. Document the date, time of inspection, who was present, and what you observed. It is recommended that you document your findings with a camera and written notes.
4. If a violation exists, issue a warning or an order to the responsible person to abate the problem. Suggested steps include:
   - Verbal warning
   - Follow-up inspection
   - Written warning
   - Follow-up inspection
   - Written order
   - Follow-up inspection

DILAPIDATED HOUSING CONDITIONS

There are several statutes that give health officers authority to order a property owner to: clean a building; repair a dilapidated structure; vacate a building; or demolish the structure because of dilapidated conditions that are hazardous to the health of the public.

HAZARDOUS AND DILAPIDATED BUILDINGS

In New Hampshire, RSA 155-B, *Hazardous and Dilapidated Buildings*, provides a definition of a hazardous building, which is "any building which, because of inadequate maintenance, dilapidation, physical damage, unsanitary condition, or abandonment, constitutes a fire hazard or a hazard to public safety or health." This RSA provides the legal framework for local elected officials to order the owner of any hazardous building to correct the hazardous condition of the building, to raze or remove the building, and to recoup any expenses associated with cost of repairs, razing, or removal.

NUISANCES

The health officer may refer to RSA 147, *Nuisances; Toilets; Drains; Expectoration; Rubbish and Waste* when dealing with situations such as garbage, infestation of pests, outdoor wood smoke, unsanitary living conditions, mold and indoor air quality. This statute also allows the health officer to order the owner or the occupants to clean and put the premises in proper sanitary condition when a building or dwelling has become a source of danger to the health of its occupants or others from want of cleanliness.

RSA 147:4 Nuisances

For more details on New Hampshire's Housing Code see:

Division of Public Health Services. 2013. "Housing." *New Hampshire Department of Health and Human Services.* Retrieved November 11, 2018 (https://www.dhhs.nh.gov/dphs/holu/documents/hom-housing.pdf)

APPENDIX E

Chapter 6 of Vermont's Rental Housing Health Code

Chapter 6 – Environmental Health Rules

Subchapter 6

Rental Housing Health Code

1.0 Authority

This code is adopted pursuant to 18 V.S.A. § 102, 3 V.S.A. § 3003(a) and 3 V.S.A. § 801(b)(11).

2.0 Purpose

The purpose of this code is to protect the health, safety and well-being of the occupants of rental housing. This code establishes minimum health and habitability standards that all residential rental housing in Vermont must conform to.

3.0 Scope

3.1 This Rental Housing Health Code shall apply to all rented dwellings, dwelling units, rooming houses, rooming units and mobile home lots used as a regular residence.

3.2 This code does not apply to a licensed lodging establishment when the occupancy is subject to meals and rooms tax pursuant to 32 V.S.A. ch. 225. This code does not apply to tents or similar structures provided to persons choosing to live in such shelters as part of what is primarily an educational or experiential opportunity.

4.0 Definitions

4.1 **"Common Space"** means all interior passageways, hallways, foyers, stairways, basements and other rooms in a dwelling or rooming house used or intended for use by the occupants of more than one dwelling unit or rooming unit.

4.2 **"Dwelling"** means a rented building or structure, excluding tents or similar structures used for the express purpose of camping, that is wholly or partly used or intended to be used as a primary residence for living or sleeping by human inhabitants. This includes

4.22 **"Trash"** means combustible and noncombustible waste materials that are not composted or recycled. This includes any products not included in the definitions of "Food Residual or Food Scrap" or "Recyclables."

4.23 **"Ventilation"** means the adequate supply and removal of air to and from a space through windows, skylights, doors, grilles, ducts or mechanical devices.

4.24 **"Violation"** means any condition in or on the premises of a rented dwelling, rooming unit, rooming house or rented mobile home lot which fails to meet any requirement of this code.

4.25 **"Watertight"** means so constructed that the structure is substantially impermeable to water.

4.26 **"Weathertight"** means so constructed that the structure resists weather and excludes rain and snow, and prevents the infiltration of air.

5.0 Sanitation Facilities

5.1 **Kitchen Facilities:** Every dwelling unit shall contain within the unit space to store, prepare and serve foods in a sanitary manner, including the presence of a kitchen sink.

5.2 **Bathroom Facilities:**

5.2.1 Every dwelling unit shall contain within the unit a flush toilet, sink and bathtub or shower located in a room or rooms separate from the habitable rooms and which affords privacy.

5.2.2 Shared Bathroom Facilities: The occupants of not more than two dwelling units which are located in the same dwelling may share bathroom facilities under the following circumstances:

5.2.2.1 Neither of the two dwelling units contains more than two habitable rooms; however, for the purpose of this section, a kitchen with not more than 60 square feet of floor area is not counted as a room; and

5.2.2.2 The habitable room area of each dwelling unit aggregates not more than 300 square feet; and

5.2.2.3 The toilet and sink are within a room separate from the habitable rooms, which affords privacy and which is accessible to the occupants of each dwelling unit without going through the dwelling unit of another person or outside the dwelling; and

For more details on Vermont's Housing Code see:

Department of Health. 2015. "Rental Housing Code." *Vermont Department of Health*. Retrieved November 11, 2018 (http://www.healthvermont.gov/sites/default/files/REG_Rental_Housing_Code.pdf)

APPENDIX F

Jennifer Ruger's Healthy Capability Profile

I. Internal Factors

A. Health status and health functioning
1. Measures of self-reported health functioning (e.g., SF-36, mental functioning, and physical functioning)
2. Measures of health conditions (e.g., biomedical markers, biomedical diagnoses, disease [e.g., HIV/AIDS, tuberculosis, diabetes, depression and other mental health disorders], risk factors [e.g., smoking, exercise, diet, drug abuse or dependence, safe sex practices, obesity, interpersonal violence])

B. Health knowledge
1. Knowledge of one's own health and health conditions (e.g., does the person with HIV, tuberculosis, or diabetes know they have it and know how to manage the disease?)
2. General knowledge of health and disease, preventive measures to protect health, and risk factors for poor health (e.g., nutrition and diet, transmission of disease, and protection [from STDs], sanitation [handwashing and waste disposal and storage], immunization [to protect against onset of disease], pregnancy and child birth)
3. Knowledge of costs and benefits of health behaviors, lifestyles, exposures
4. Knowledge of how to acquire health information and knowledge (e.g., modes of information gathering [health care provider, Internet, journals and books, special interest groups])

C. Health-seeking skills and beliefs, self-efficacy
1. Beliefs about one's ability to achieve health outcomes, even under adverse circumstances
2. Ability to acquire skills (e.g., monitoring glucose levels, use of condoms) and apply them under changing circumstances to work toward positive health outcomes
3. Confidence in ability to perform or abstain from health behaviors and actions

D. Health values and goals
1. Value of health
2. Value of health-related goals (e.g., cholesterol levels)
3. Value of lifestyle choices and behaviors (e.g., moderate versus excessive drinking)
4. Ability to recognize and counter damaging social norms

E. Self-governance and self-management and perceived self-governance and management to achieve health outcomes
1. Self-management and self-regulation skills and expectations
2. Ability to manage personal and professional situations: ability to handle external pressures (e.g., children, work, household and extended family responsibilities, finances, marital and personal relationships)
3. Ability to make the connection between cause and effect with regard to personal behavior and health outcomes; personal responsibility
4. Ability to draw on networks of social groups
5. Vision, direction, planning, strategy, and ability to make positive health choices

F. Effective health decision-making
1. Ability to effectively use both knowledge and resources to prevent onset or exacerbation of disease or prevent death
2. Ability to weigh the short-term and long-term costs and benefits of health behaviors and actions (e.g., smoking)
3. Ability to identify health problems (e.g., employ guidelines of prevention, recognize signs and symptoms) and pursue effective prevention and treatment
4. Ability to make healthy choices under various environmental constraints (e.g., abstain from unpotable water, use sunscreen and bed nets)

II. External Factors

A. Social norms
1. Extent to which health norms are scientifically valid and evidence-based
2. Extent to which health behaviors and health-seeking skills are viewed favorably (e.g., cultures of abstinence from alcohol, drugs, sexual activity) or unfavorably (e.g., cultures of alcohol abuse, obesity within family)
3. Extent to which a health behavior is adopted by a majority or minority of a population in the culture (e.g., whether circumcision is widely accepted and practiced) and by whom
4. Extent to which discrimination or antidiscrimination is the dominant norm in the provision of health care and public health services, influencing disparities in access
5. Norms about decisional latitude or power in familial and social contexts
6. Society's ability to recognize and counter damaging social norms and promote positive ones

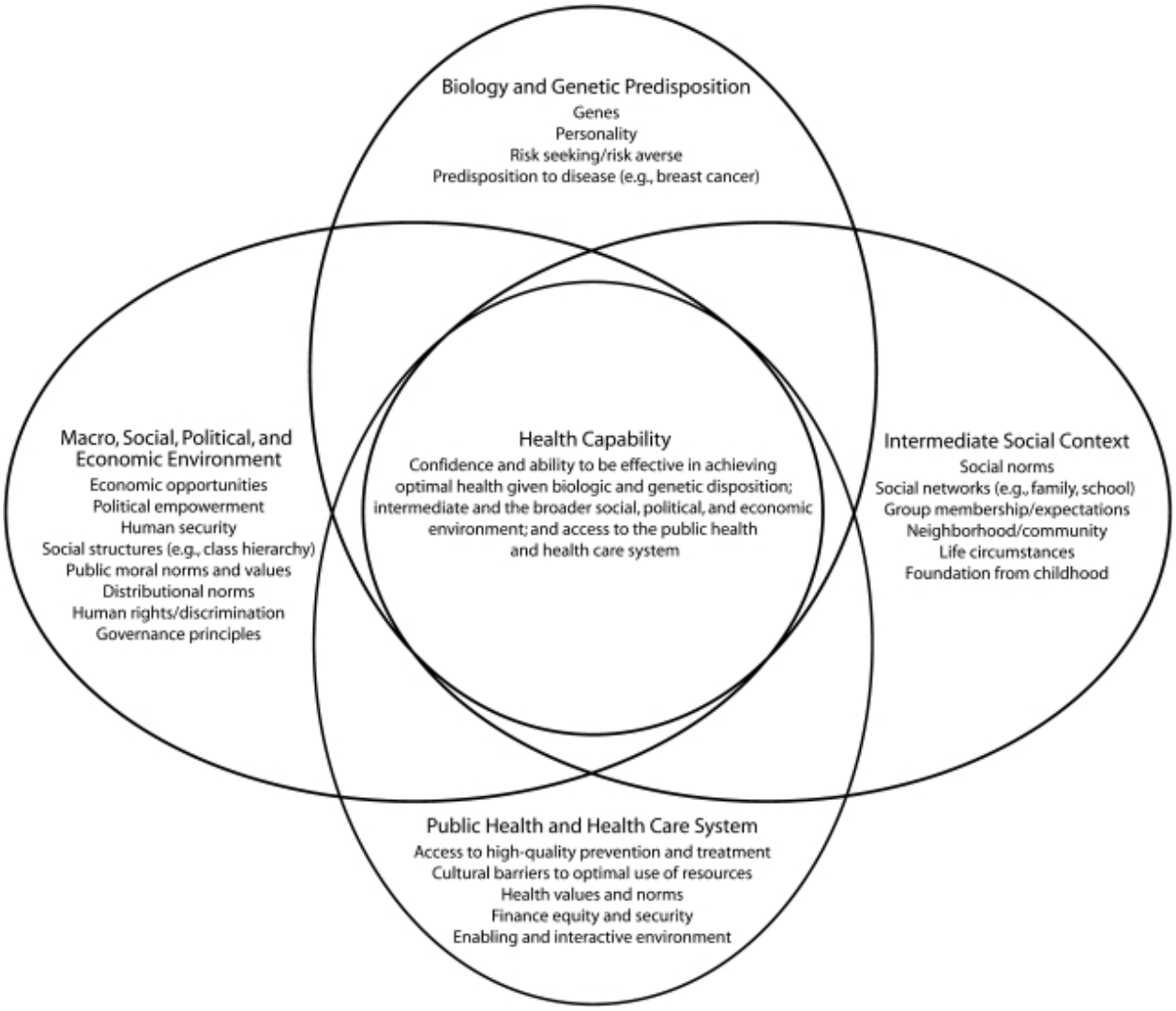
B. Social networks and social capital for achieving positive health outcomes
1. Emotional or instrumental support from friends and family (e.g., loving and caring family and friends who help with specific tasks or needs, such as watching children, picking up children from school)
2. Existence of available networks of social groups
3. Extent to which social networks may negatively impact health (e.g., bullies and their complicit accomplices, the ''old boys'' network, the ''in crowd'')

C. Group membership influences: church, union, community membership to supplement or counterbalance social norms and social assistance in other social contexts

D. Material circumstances
1. Economic: income and employment status
2. Neighborhood and community (e.g., safety, noise, environmental pollutants, neighborhood facilities and resources)
3. Safe water and good sanitation
4. Housing
5. Food security
6. Extent to which immediate environment is toxin- or disease-free (e.g., toxic air, soil, water, inundated with malaria-infected mosquitoes)

E. Economic, political, and social security: extent to which individuals and groups feel secure or insecure in their immediate and broader macrosocial environment (e.g., broader changes in the national and subnational economic and political systems generating job, financial, or political insecurity and pessimistic outlook, violence, criminal activity)

F. Utilization and access to health services: sought and obtained health services when care was thought needed
1. Serious symptoms of poor health conditions (e.g., shortness of breath, frequent or severe headaches, chest pain, lump in breast, fever, back or neck pain, loss of consciousness)
2. Morbid symptoms of poor health conditions (e.g., sadness, hopelessness, anxiety, pain in knee or hip, fatigue or extreme tiredness, difficulty hearing, fall or other major injury)



Ruger, Jennifer Prah. 2010. “Health Capability: Conceptualization and Operationalization.” *American Journal of Public Health* 100(1):41-49.

APPENDIX G

Survey Invitation

Dear <First Name>:

Congratulations again on being accepted into the <Name of the Housing Project> in <Town, State>.

I am writing to request your participation in a survey aimed to learn more of the connections between housing and health. All other applications accepted into the housing program have been sent this invitation to participate in the study.

The purpose of the study, managed by Twin Pines, is to see if our housing projects increase the health of our tenants. If we were able to prove this, we'd be able to possibly get more funds to continue building more houses and apartments like the one you've been assigned. We need your help make this happen.

Your participation in this survey is completely voluntary and you may opt out of any question in the survey. All of your responses will be kept confidential. They will only be used for statistical purposes and will be reported only in aggregated form.

The survey will take an estimated 20 minutes; however, it should not be too difficult as someone will read and explain the questions to you, whenever asked to clarify. The survey will continue over two years, and you will be surveyed every six months, totaling five surveys.

If you are interested in participating in the study, please initial here _____

Lastly, be sure to mail your response using the prepaid postage envelope attached. Thank you in advance for your time.

Sincerely,

Twin Pines Housing Trust

Be sure to include pre-paid postage envelopes