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Public Housing and Well-Being: Evaluation Frameworks to Influence Policy

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Abstract

Background. A robust evidence base is needed to develop sustainable cross-party solutions for public housing to promote well-being. The provision of public housing is politically contentious in New Zealand, as in many liberal democracies. Depending on the government, policies oscillate between encouraging sales of public housing stock and reducing investment and maintenance, and large-scale investment, provision, and regeneration of public housing. *Aim.* We aimed to develop frameworks to evaluate the impact of public housing regeneration on tenant well-being at the apartment, complex, and community levels, and to inform future policies. *Method.* Based on a systems approach and theory of change models, we developed a mixed methods quasi-experimental before-and-after outcomes evaluation frameworks, with control groups, for three public housing sites. This evaluation design had flexibility to accommodate real-world complexities, inherent in evaluating large-scale public health interventions, while maintaining scientific rigor to realize the full effects of interventions. *Results.* Three evaluation frameworks for housing were developed. The evaluation at the apartment level confirmed proof of concept and viability of the framework and approach. This also showed that minor draught-stopping measures had a relatively big impact on indoor temperature and thermal comfort, which subsequently informed healthy housing standards. The complex and community-level evaluations are ongoing due to longer regeneration timeframes. *Conclusion.* Public housing is one of central government's larger social sector interventions, with Kāinga Ora – Homes and Communities the largest Crown entity. Evaluating public housing policies is important to develop an evidence base to inform best practice, rational, decision-making policy for the public as well as the private sector.

Keywords

New Zealand, public health, public housing, regeneration, thermal comfort

Housing for low-income populations, such as public housing, differs in form depending on the context and country (Howden-Chapman, 2004; Kemeny, 2006; Organisation for Economic Co-operation and Development [OECD], 2016). New Zealand is unusual in that the majority of public housing is directly owned and managed by the central government, with a small nongovernmental organization (NGO) sector (OECD, 2017). This has the potential for quick implementation of good, well-reasoned policy change. In contrast, in the United States, the U.S. Department of Housing and Urban Development administers federal funding to local housing agencies and private entities, both for profit and nonprofit, that manage supportive housing (OECD, 2016).

While context and implementation are very important in public housing, there is still a need for a common evidence base with related robust frameworks. This currently does not exist, despite extensive literature being published on U.S. remediation projects such as HOPE VI and Moving to Opportunity. We conducted an international literature review, which identified 52 public housing intervention projects that evaluated specific well-being domains (Rangiwhetu, 2019). The majority (33) of these projects used cross-sectional evaluation designs (retrospective or point in time studies), or did not use controls. This leads to well-known limitations, such as history and maturation effects, interfering with causal attribution. There were also extensive variation in interventions

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implemented, evaluation designs and measures used, and level of data collected, making them difficult to compare and learn from. Further robust research is needed to form a credible evidence base.

Public Housing in New Zealand

In New Zealand, public housing has been a subject of tumultuous political discussion. Historically, public housing in New Zealand has been viewed as a vital part of the nation's infrastructure and primarily the responsibility of the central government, in recognition that the private housing market failed to provide for everyone (Schrader, 2012). Initial public houses were built for the working class to a standard fit for a cabinet minister and set the standards for private developers (Allan, 2016). Tenants were also guaranteed a house for life. However, expectations of public housing have changed over time. Public housing has oscillated from the idea of welfare as opportunity, for citizenship and redistribution, to welfare as dependency, targeted toward providing secure, affordable, and appropriate tenure for housing those with serious need (Murphy & Kearns, 1994; Schrader, 2006).

The previous center-right government (2008–2017) aimed to sell off a third of the central government's housing stock (Howden-Chapman, 2015). Their "Social Housing Reform Programme" and vision of providing public housing for people in need—"that is of the right size and in the right place, for those most in need, for the duration of their need" (Housing New Zealand Corporation, 2017, p. 8)—also meant tenants had less security of tenure (Johnson, 2014).

A lack of investment in public housing over time has resulted in unfortunate consequences, such as tenant deaths (Dennett, 2015; Walters et al., 2015) and an increase in homelessness (Amore et al., 2013). With the change to a center-left government in 2017, public housing sales were halted and promises were made to rapidly increase the building of public and affordable housing until demand was met (I. Davidson, 2017). A new agency was established, Kāinga Ora – Homes and Communities, which is the Crown's largest company with assets of $29 billion and approval to raise money for long-term investments on the international bond market (Kāinga Ora – Homes and Communities, 2019). There is considerable public interest in the major investment in this area and monitoring the impacts of these progressive policies and natural experiment on tenant well-being.

Given most New Zealand political parties now agree there is a housing crisis, a robust evidence base is needed to foster cross-party collaboration for the country's long-term benefit. Evaluating interventions undertaken by other public entities, such as Wellington City Council (WCC) and Tāmaki Regeneration Company (TRC), who have been investing in upgrading their public housing stock, can help inform recommendations with respect to tenant well-being in this area.

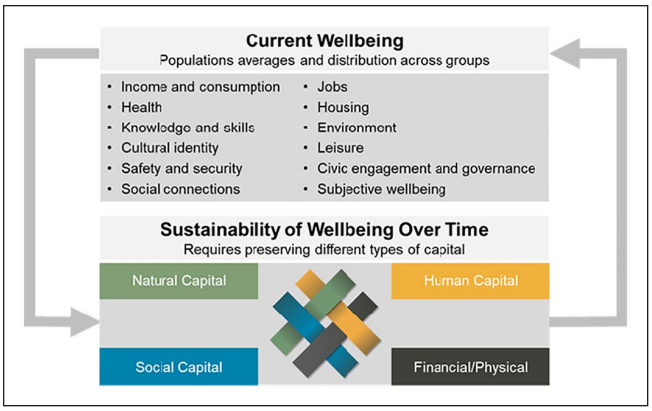

Figure 1. Treasury's four capitals that support well-being.
Note. Reproduced from Ormsby (2018).

Well-Being

Most definitions of well-being are derived from Amartya Sen's capability framework (Sen, 1993), which involves human needs being met and the "ability to pursue one's goals, to thrive and feel satisfied with their life." The New Zealand Treasury has adopted a well-being framework, based on the OECD framework, that conceptualizes the domains or key characteristics considered essential to evaluate well-being (see Figure 1). Housing is a well-being domain in its own right, and various dimensions of public housing affect the four capitals of well-being. Focusing on well-being domains enables assessment of the impact of public housing policies across broad system indicators. Specifically, we sought to explore the impact of public housing remediation on the three well-being domains of health, social connections, and safety (Ormsby, 2018).

Cold and damp housing has been associated with respiratory and cardiovascular disease in particular (Ormandy & Ezratty, 2012). Warmer and drier housing is therefore expected to improve health, as seen in previous housing remediation studies (Howden-Chapman et al., 2007; Howden-Chapman et al., 2008). Housing interventions can result in increased opportunities for positive interactions, as enhanced self-esteem and pride can reduce isolation, and improve social cohesion and community integration (Arthurson et al., 2016; Clark & Kearns, 2012). Rehousing tenants to improve their housing quality can disrupt local support networks and therefore should be considered carefully if necessary. In terms of safety, Cozens et al. (2005) and the Ministry of Justice (2005) also claim that a large, growing body of research supports the assertion that Crime Prevention Through Environmental Design is a pragmatic and effective crime prevention tool, whereby the physical environment is manipulated to alter users' behavior and decrease the opportunity for criminal activity.

Findings from our international literature review, mentioned earlier, indicated remediation of public housing was

Table 1. Three Levels of Housing Interventions.

Level of intervention	Explanation	Intervention we evaluated
Apartment level	Interventions made to the indoor environment in discrete units For example, installation of heating, insulation, double glazing for individual units, and equipment within housing	Minor additions, in the form of sealing strips and baffles in rangehoods, were installed in Marshall Court, Wellington (a recently upgraded WCC complex with 27 units), over a week in 2015.
Complex level	This includes interventions at the apartment level as well as changes to the physical fabric/infrastructure of the units and/or environment within a defined site or sites by one public housing provider For example, extensive rehabilitation with the addition of solar panels, a community garden for the complex, and demolition and rebuilds	A section of Arlington, WCC's largest public housing complex with 269 units, was demolished and rebuilt between 2016 and 2018.
Community level	This includes interventions at the apartment and complex level as well as changes to the environment/urban landscape of the neighborhood, social services for general use and social systems, and may involve more than one public housing provider For example, wrap-around services and social programs; community infrastructure such as libraries, schools, and open space; and mixed income community developments	In Auckland, TRC is planning to regenerate three suburbs (comprising Tāmaki) over a couple of decades, replacing 2,500 public houses with mixed housing (including at least as many public houses as before) and provide social services.

Note. WCC = Wellington City Council; TRC = Tāmaki Regeneration Company.

predominantly positive in terms of mental health and crime-related results across all projects. Just under half of the projects also reported improved physical/general health and social connections for tenants, with a number of projects reporting no changes in physical health. However, as stated, frameworks were not consistent across projects and most were poor quality. Common frameworks need to be adopted to better understand cause-and-effect mechanisms to guide policy.

Aim

The aim of our work was to develop robust and common frameworks that worked at the apartment, complex, and community levels to assess the impact of public housing remediation and regeneration on tenant well-being and guide future policies in this area.

Method

We developed three evaluation frameworks at the apartment, complex, and community levels to determine the impact of remediation on tenant well-being (see Table 1 for a breakdown of the level of intervention). These frameworks included key stakeholders; evaluation objectives and questions; evaluation design and approach; theory of change, associated measures, and assumptions; the desired sample; data collection and analysis processes; baseline figures and targets where appropriate; and risk matrices.

The evaluation design, mixed methods quasi-experimental before-and-after with control groups, had flexibility to accommodate real-world complexities, inherent in evaluating large-scale public health interventions, while maintaining scientific rigor to realize the full effects of interventions and promoted causal attribution (Shadish et al., 2002). Understanding cause-and-effect is important in order to attribute impact to a particular intervention (J. Davidson, 2005). Even if observed changes align with researchers' expectations or project managers' goals for an intervention, "we cannot correctly refer to these as 'impacts' or 'outcomes' unless we can demonstrate that the [intervention] was at least a primary cause of those changes" (J. Davidson, 2005, p. 67).

The rest of this section outlines the criteria we adopted for the outcomes evaluation frameworks (Ambrose et al., 2018; Bond et al., 2013; J. Davidson, 2005; Gatzweiler et al., 2016; Goyder et al., n.d.; Rogers et al., 2015; Thomson et al., 2013). The University of Otago's Ethics Committee approved the project, with the reference code 14/144. Participants provided informed written consent.

We adopted a systems approach, and acknowledged interaction effects, with well-being domains known to have an impact and/or pay dividends in another (as illustrated by the theory of change in Figures 2 and 3). To claim attribution, isolating one variable is helpful. However, given system effects this was not always practical, especially as the size and complexity of remediation increased.

Key stakeholders were identified early on (including but not limited to project managers, funders, and tenants). We actively sought to build rapport, and worked cooperatively to develop, and where possible co-design, the framework. This assisted us gain access to information, which was often sensitive, to generate useful insights and shared understandings as well as enabled increased responsiveness when plans changed. For project managers, this facilitated rapid response and adaptive management of their projects. Key stakeholders

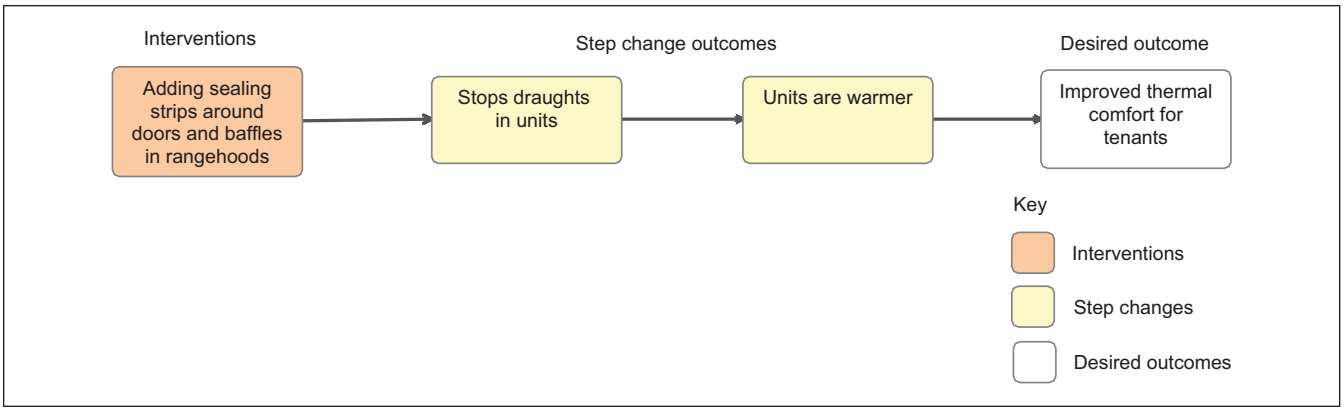

Figure 2. Apartment-level theory of change for Marshall Court.

were also considered from the beginning, to understand their information needs, the timing of key decision-making points for the evaluation to feed into, and the best method to communicate with them throughout. We were careful to manage stakeholder expectations, as the process was not straightforward and often iterative requiring flexibility and adaptability. Potential shifts, including large organizational transitions (e.g., staff turnover and changing political mandates), were built into the frameworks in the form of risk matrices and contingency plans.

With the help of policy makers, we tailored the frameworks to fit the local context. This is because different contexts, starting points for tenants, types of interventions, length of time interventions take, and amount of resources invested can influence results. Shared understanding of these factors enabled comparison of results with similar interventions. Objectives for the evaluation and guiding evaluation questions were also tailored to the context and based on the type of intervention, resources invested, and theory of change models.

In conjunction with stakeholders, we developed theory of change models that underpinned the projects, connected inputs to objectives, and articulated assumptions implicit in step changes (so that, where necessary, potential negative consequences could be monitored, e.g., displacement of crime or mode shifts). Testing and measuring assumptions are particularly important if they are novel. Empirical or theoretical research that outlined the impact of similar projects was drawn on.

A quasi-experimental before-and-after approach with control groups was adopted to promote attribution of causation using difference in differences analysis (Craig et al., 2012). We identified measures, and sources of information, to investigate the impact of pathways over time. For the most part, measures used already existed and were proven in this space. This allowed for benchmarking and wider occurring events to be taken into account. Results fluctuated over time in other housing projects; therefore, longitudinal studies with as many data points as possible were recommended for the larger interventions. Large, linked, administrative datasets are useful in this regard, as they can be used to track individuals over time (Gibb et al., 2016).

Mixed methods were used as quantitative and qualitative, subjective, and independent approaches can provide illuminating insights. Specifically, we undertook a range of face-to-face surveys with tenants; temperature, humidity, and energy use monitoring of units; and analysis of maintenance records. We also analyzed administrative data on housing-related hospitalizations, doctor visitation, mental health referrals, and police records of victimizations.

Results

Three frameworks were developed. Nested theory of change models were created at the three spatial levels (see Figures 2 to 4 for a sample of these). These models share commonalities, but also respond to the context and increasing complexity, stakeholder goals, and measures for each project. For example, the apartment-level intervention was expected to lead to warmer units and tenant comfort through draught-stopping. At the complex level, a number of interventions, including complete demolition and rebuild of weathertight units, were expected to improve the indoor temperature and comfort of tenants leading to improved health and social connections. The community-level intervention included a range of new builds and retrofits with wrap around services, which again was expected to lead to warmer units and improved health, contributing to a vibrant community where residents lead good lives.

The evaluation at the apartment level confirmed proof of concept and viability of the framework and approach. The evaluation at this level also found that minor draught stopping measures had a relatively big impact on indoor temperature and thermal comfort. Marshall Court had a 1.36°C increase in indoor temperature postintervention after accounting for outdoor temperature (Rangiwhetu et al., 2017), while the indoor temperature at the control site decreased over the corresponding period.

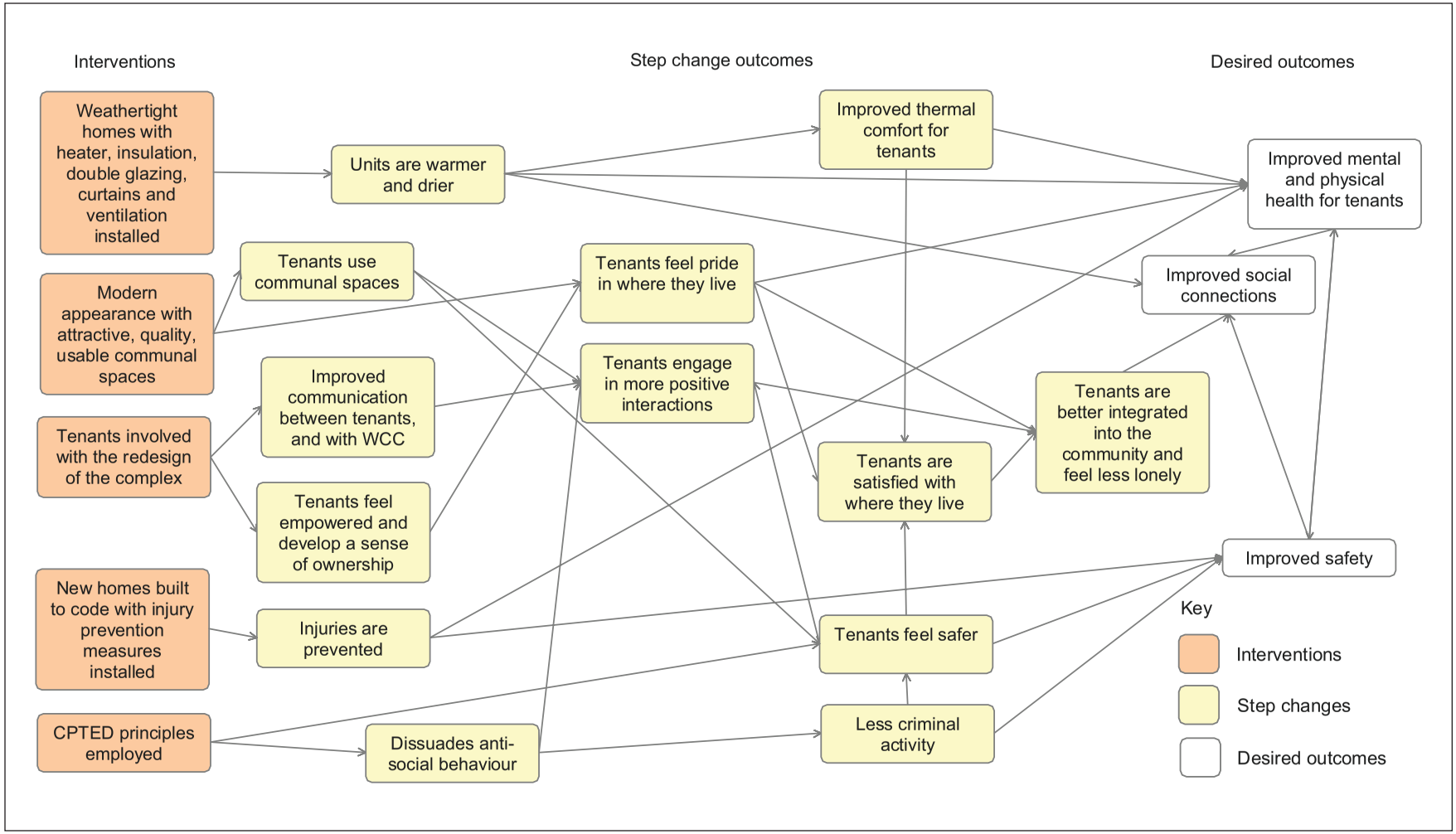

Figure 3. Complex-level theory of change for Arlington.

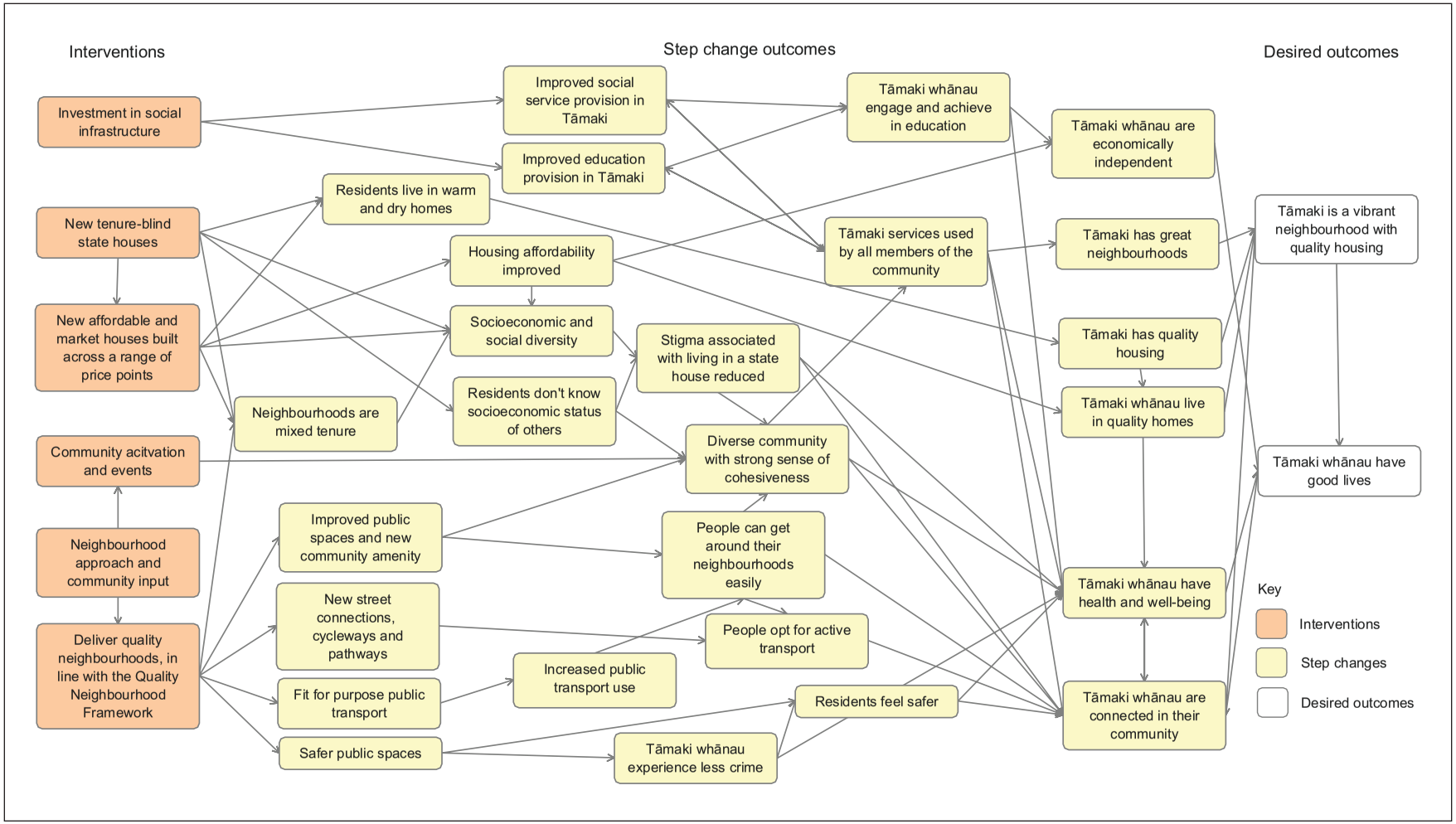

Figure 4. Community-level theory of change for TRC's neighborhood regeneration initiatives.

For this project, we worked closely with WCC managers and undertook rapid response research (Nakashian, 2015), so decision makers had the results within a short timeframe of a month, including 10 days of temperature monitoring. This allowed project managers to assess how cold the units were after complaints from tenants, determine whether the interventions made a difference and to what extent, and assess whether they needed to take further action. Stakeholders responded positively to the evaluation. As managers could demonstrate the positive impact their intervention had made, this helped ease tensions between the landlord, WCC, and residents who had complained of being cold.

After publishing our findings and disseminating our work to colleagues, staff at housing organizations around the country, ministers, and to the media, our work was subsequently picked up by policy makers in the housing field. The evaluation at Marshall Court was cited in the Ministry of Business, Innovation and Employment's public discussion document on healthy housing guidelines, which informed the NZ Healthy Housing Standards (Ministry of Housing and Urban Development, 2019), recently released by the center-left government, as part of the Healthy Housing Guarantee Act 2017 (Ministry of Business Innovation and Employment, 2018). Evaluations at the complex and community level are ongoing.

Discussion

It is possible to develop evaluation frameworks with common elements at the apartment, complex, and community levels. However, while theory of change models have been around for a long time as a project management tool, from our experience they are not widely used. When the evaluations are carried out robustly and the evidence is presented and disseminated widely, due to the political prominence of housing in New Zealand, this can have an impact on public opinion and policy.

To date, the evaluations of the three public housing sites have indicated that remediation and regeneration initiatives are worthwhile for tenant well-being; as cold housing is detrimental for health, particularly cardiovascular and respiratory health (World Health Organization [WHO], 2018). Baseline data at Arlington and Tāmaki, where the complex- and community-level interventions are being undertaken, found average temperatures in monitored units (14.9°C and 16.6°C, respectively) were below WHO recommendations.

Interventions at the apartment level had a positive impact on indoor temperature and tenants' thermal comfort. Draught stopping led to an increase in temperature of 1.36°C, which is larger than the effect noted from insulation and heating studies in general New Zealand housing (0.5°C to 1.1°C; Howden-Chapman et al., 2007; Howden-Chapman et al., 2008). This research has contributed to positive changes to New Zealand's legislation with respect to the Healthy Housing Standards passed in 2019 under the Healthy Housing Guarantee Act 2017.

These Healthy Housing Standards include more stringent requirements for heating, insulation, ventilation, moisture entry and drainage, and draught stopping for rental housing in both the public and private sectors. This is a welcome addition and likely to reduce hospitalizations, with 28,000 New Zealand children currently hospitalized annually due to housing-related diseases (Oliver et al., 2018). However, the average indoor temperature of the upgraded units at Marshall Court, built to the current New Zealand building code, which meets the newly introduced standards and had won architectural awards, was 17.6°C postintervention, still under the WHO recommended minimum of 18°C (WHO, 2018). This indicates further policy work is needed in this area, particularly with respect to the building code.

Postintervention data are yet to be collected at the complex and community levels. Evaluations are ongoing due to the longer regeneration timeframes (up to 25 years for the community intervention). Larger evaluations also require extensive data collection and testing of assumptions. Further data on health, social connections, and safety will be reported as it becomes available.

Our research is only one component in the endeavor to develop a robust evidence base in this area. Lessons can also be learnt from other international projects. For example, the Scottish Housing Health and Regeneration Project (SHARP), at the community level, which used a quasi-experimental controlled before-and-after evaluation approach, reported positive findings across multiple well-being domains including housing conditions, social connections, and safety, although no changes in mental or physical health were seen (Kearns et al., 2008; Petticrew et al., 2008; Petticrew et al., 2009). England's Eastlake Estate project (Halpern, 1995), at the complex level, and U.S.'s green housing remediation (Jacobs et al., 2015), at the apartment level, also found positive results across multiple well-being domains using similar evaluation approaches. However, further robust evaluations are still needed, which take account of political structures and social norms, particularly as the intervention size increases, to guide decision making.

Given the importance of context, it is also necessary to ensure learnings are relevant to a particular country before directly applying them. In New Zealand, both schools and health care are funded from central government taxes; therefore, many conclusions about impacts on well-being and health in the United States, for example, are less applicable.

Implications for Policy

It is important for research evidence to inform policy: to "improve the reliability of advice concerning the efficiency and effectiveness of policy settings and possible alternatives" (Australian Government Productivity Commission, 2010, p. 13). It is especially useful to inform what works and under what conditions. A sound evidence base in this area can help provide a secure and sustainable platform to support

transformation of the lives of current and future low-income, public housing tenants. Evaluations on large public health interventions, especially housing-related initiatives, are often challenging due to lengthy timeframes that are subject to change, multiple components, and the cost involved (Bond et al., 2013). However, not conducting research in this area leads to an "inverse evidence law" effect, where preventive policies aimed at addressing wider determinants of well-being may have little or no robust evidence on which people can come to an informed decision (Bond et al., 2013). In turn, this can have long-term impacts on individual and community well-being and have large financial repercussions.

However, policy making can be chaotic in nature. Decision making and policy formation do not just take into account evidence. Other important factors to acknowledge are value preferences, different cultural perspectives, the media, social movements, policy options, competing agendas, practical judgements about feasibility and legitimacy, and varying circumstances or balance of political power (Carey & Crammond, 2015; Smith & Katikireddi, 2013). Davis and Howden-Chapman (1996) claimed that dissemination and influence on policy is promoted if researchers work alongside policy makers to develop frameworks, researchers are invested in seeing work translated into policy, and the work is topical and timely. Therefore, working with stakeholders is more likely to lead to better outcomes for tenants.

Alongside developing evidence, we worked closely with organizations such as WCC and TRC, and with stakeholders that had the power to influence and create policy. Flexibility and adaptability were key, especially as the size of the intervention and evaluation increased. Having an understanding from the outset that development of the evaluation framework was an iterative process was important to its success, and communicating this with stakeholders helped reduce tensions.

We have also disseminated work through articles (Rangiwhetu et al., 2017; Rangiwhetu et al., 2018), presentations, and the media to build awareness and influence values preferences. The fact that housing is very topical in New Zealand and the timing of the work coincided with a change in political power to those sympathetic to the findings also meant the work has been more readily picked up.

The center-right government continued the previous left-wing government's requirement for compulsory insulation in all new housing during its time in power and also introduced a requirement to have minimal insulation standards in all rental housing. However, they opposed the Healthy Homes Guarantee Bill and further changes; therefore, it is presumed that had they stayed in power it would not have been passed (Cooke, 2017). Without evidence, it is less likely that the incoming government would have got sufficient support to pass the bill either, as it was controversial, with many landlords groups lobbying against it.

The frameworks gave us confidence to assume attribution between the intervention and the impact noted. The policy change overall was informed by a range of evidence. However, with respect to draught stopping, one of the five standards introduced under the Health Homes Guarantee Act, only our work was cited as evidence in relation to the impact of draught stopping interventions. This indicates a dearth of information in this area and the importance of this work on informing this standard.

In general, there is scarce evidence to suggest research impacts on implementation such as health reforms (Davis & Howden-Chapman, 1996). The response to date has been promising with the introduction of the Healthy Homes Guarantee Act 2017 and subsequent guidelines that have cited this work alongside wider research done by He Kāinga Oranga, and many others.

Limitations

Due to the timeframes of large-scale public housing remediation, data collection and analysis take a number of years and requires researcher flexibility. Changes in project plans have meant that some tenants will not be the same before and after remediation for the larger complex and community projects. However, we have placed particular emphasis on tracking individuals over time, for example, through the use of New Zealand's Integrated Data Infrastructure (Gibb et al., 2016). As housing organizations are responsible for those living onsite at the time an intervention commences, their well-being should be the primary concern of any intervention, and results should reflect changes to these individuals rather than potentially gentrification.

As some results are context and intervention dependent, this may limit their generalizability. Community improvements done well in one area may not have the same effects if implemented in different circumstances elsewhere.

Conclusion

Remediating the public housing stock is one of the current New Zealand government's largest social sector interventions, as the current volume and stock of public housing is inadequate to meet the needs of New Zealand's most vulnerable populations. The introduction of the Healthy Housing Guarantee Act 2017 is one step in the right direction.

How to best evaluate and learn from remediation interventions requires considerable attention to think through the complexity involved with interacting components. Evaluations with common frameworks are necessary to develop a robust evidence base to further inform best practice and rational, long-term, cross-party policies to ensure sustainable housing for tenants going forward.

Authors' Note

Supplementary materials including table of measures, evaluation questions, and risk matrices will be made available on request. Please email lara.rangiwhetu@postgrad.otago.ac.nz.

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Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Philippa Howden-Chapman is a director on the Board of Kāinga Ora – Homes and Communities. The views expressed here are hers and do not necessarily reflect the views of the Board of Kāinga Ora.

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