Housing & Health

RESEARCH, POLICY AND INNOVATION

edited by
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AUSTRALIA NEW ZEALAND
Contents

Introduction Philippa Howden-Chapman & Penelope Carroll 7

1. Housing as a socio-economic determinant of health: a Canadian research framework James R Dunn, Michael Haynes, David Huchanski, Stephen Hwang & Louise Potvin 12

2. Home, housing, health and wellbeing David Thorn 40

3. Critical issues in housing: research challenges & responses Kay Saville-Smith 49

4. Housing, crowding and health Michael Baker, Jasminka Miloseric, Tony Blakely, Philippa Howden-Chapman 57

5. Housing provision in New Zealand Michael Lennon 70

6. Housing and health research in Auckland Chris Ballen 74

7. Reducing health inequality through improving housing: He Kainga Oranga/Housing & Health research programme Philippa Howden-Chapman, Julian Crane, Michael Baker, Chris Cunningham & Anna Matheson 83

8. Is this what they mean by free range? – Researching housing and health in the Northern Territory Ross Bailie 93

9. New perspectives on Maori housing solutions Raw Hokiwi 113

10. Bioclimatist research at BRANZ: modelling and controlling dust mite microclimates Malcolm Cunningham 119

11. Housing, health and energy Nigel Isaac, Michael Camilleri & Andrew Pollard 126

12. Changing housing policies, poverty and health Charles Waldgrave, Peter King & Robert Stephens 144

13. Extending the agenda of housing and health research Robin Kears 157

14. Workshop reports from the research day 166

Contributors 169

Index 172
Introduction

Philippa Howden-Chapman and Penelope Carroll

It is often assumed that poor housing contributes to ill health, despite the paucity of robust research on this topic. Nonetheless, there is a growing body of research and the funding is 2001 of He Kaienga Oranga/The Housing and Health Research Programme by the Health Research Council of New Zealand has provided an opportunity to set up long-term research on housing interventions. The programme has also provided us with the resources to take stock of the range of housing research being done nationally and internationally — in public health and architecture, epidemiology and engineering, sociology and physics (Howden-Chapman 2004). It has been over two decades since there has been a survey of housing research in New Zealand.

The Housing and Health Research Day, funded in part by Housing New Zealand Corporation (HNZC) as part of the 2003 Department of Public Health Summer School, was a forum to discuss housing research in New Zealand. Its agenda was inevitably incomplete. This book extends the day’s contributions by allowing contributors to revise their papers in the light of the discussions, and by including the work of other important housing researchers and reports from two of the day’s workshops. The book aims to highlight the breadth and depth of current housing research and to signal major gaps in our knowledge that need to be addressed.

There is a strong strand of research which has theorized about housing as home and housing as a symbol of relative social position. These theories balance economically-driven theory that sees housing predominantly as a capital investment and to some degree are blended in the theory that sees housing as a cornerstone of the social and economic determinants of health. This explicit theoretical context is a strength of the field and is evident in the first three chapters in this book.
James Dunn and colleagues provide a conceptual model of housing as a socio-economic determinant of health. This model has underpinned a Canadian consultation exercise assessing needs, gaps and opportunities in housing and health research. Tailored to the Canadian context, the model has developed out of research from Canada, Australia, the USA, the UK and New Zealand and sets the agenda for housing and health research. Dunn argues that housing is a crucial lens through which we can better understand the "socio-economic geographies of everyday life", as well as reflecting unequal social relations, both of which influence health.

David Thomas takes a multi-dimensional approach to understanding the intersection of houses, households and the process of home making, and their importance for the development of sound policies to enable stable family and community formation and social connectedness.

Kay Saville-Smith has moved beyond individualized housing consumption and housing need in her consideration of the extent to which housing underpins familial and community capacities and capabilities.

Housing research in New Zealand has a strong, strategic and applied aspect. Michael Baker and colleagues in the Housing and Health Research Programme outline the Housing, Crowding and Health study, designed to determine whether reductions in household crowding can lower the risk of important infectious diseases such as meningococcal disease and rheumatic fever, which are epidemic in New Zealand. This unique cohort study of all HNZC applicants, who are re-housed as HNZC tenants in less crowded social housing, follows on from an influential case-control study that showed that household crowding was the main risk factor for meningococcal disease in Auckland children.

Michael Lennon, former chief executive of HNZC, reflects on the innovative schemes introduced to eliminate substandard housing and reduce overcrowding in state houses. He adds that the cultural shift needed for more integrated service delivery to tackle fragmentation and bring more innovation, more regional focus and more balance between outcomes, outputs and capability.

HNZC has been leading the development of a strategy to address some of these issues and this chapter discusses the roles of the various government agencies who have jurisdictional authority in the area.

Chris Batten, reviewing housing and health research in Aotearoa, notes how frustration with the lack of government responsiveness to obvious housing need has led housing advocacy groups into the research field. He emphasises the need for meaningful research partnerships, which benefit communities being researched.

Philippa Howden-Chapman and colleagues discuss two further Housing and Health Research Programme projects, formulated and carried out in partnership with local communities. The aim of the Housing, Insulation and Health Study is to benefit the communities by providing material improvements to their houses and increasing knowledge of the links between aspects of housing and health such as cold and damp. The Tokelau Extended Family Study describes a three-way partnership between the Tokelau community, researchers and HNZC, to design and build prototypes for sustainable housing for extended families.

The importance of the physical aspects of the built environment is also highlighted by Ross Baille, who outlines housing and health research being carried out in Australia's Northern Territory and highlights the challenges around balancing the pragmatic issues of indigenous housing delivery with lifestyle and social requirements. Rau Hoskins puts this in a New Zealand context, looking at design concepts and issues around tailoring housing solutions for Māori communities.

Two scientists with the Building Research Association of New Zealand draw attention to the health implications of their quantitative research on indoor living environments. Malcolm Cunningham reports on findings about bio-contaminants and associated health effects, while Nigel Ionacz looks at energy use patterns discernible from ongoing surveys and monitoring.

In the last two decades there have been major changes in New Zealand housing patterns reflecting macroeconomic changes, changes in household formation, housing preferences and economic preferences. Charles Waldegrave and colleagues provide an overview of housing policies since the early 1990s and their impact on low-income households. They look at the financial impact on household budgets of three policy instruments: the 1992 'tenure-neutral' Accommodation Supplement, the introduction of the social allocation formula, and the reintroduction of income-related rents for social housing in 2002.

With the sell-off of some of the most desirable state housing in the 1990s, the major growth has been in the private rental market, which has a long history of discrimination by landlords. As Robin Koorey highlights in this chapter, New Zealanders have a high rate of residential mobility, particularly among those groups most marginalised economically. He calls for an extension of the boundaries of housing research to include the participatory qualitative research
necessary to tease out the implications for different groups. For example, moving can improve health for some marginalised groups. In the case of Maori, there are broader-scale movements to and away from the cities, which need to be included.

Co-operation and research needed

From a public health perspective, the chapters in this book highlight the potential for housing policy and practice to promote health at a number of different levels. The improvement of housing conditions is a practical intervention which requires co-operation across many government agencies, e.g., Health, Environment, Finance, Social Development, and those representing Maori and Pacific peoples. A concerted approach is needed to redress the amount of deferred maintenance in New Zealand’s housing stock, about two-thirds of which was built before the 1977 Building Code raised standards.

Improving physical housing conditions alone will be insufficient to realise possible population health gains. Also needed are both qualitative and quantitative research to increase our understanding of the socio-economic aspects of housing, the impact of different tenure patterns for social and ethnic groups, and the effects of surrounding neighbourhoods.

Most of the research highlighted here has been based on primary data. However, there are large amounts of regularly collected data on housing through the census and rating valuations that lend themselves to future research, particularly with the growing opportunities for data linkage. With some notable exceptions, there is still a dearth of research on the health impacts of recent housing policy changes. For example, the changes in housing policy in the early 1990s and their later impact on crowding and the rise of childhood infectious diseases have yet to be seriously investigated; likewise, the impact of the introduction of income-related rents on regional residential mobility, overcrowding and poverty.

The strength and breadth of the research described in this book show the considerable potential for housing interventions to again be a cornerstone of enlightened social and health policy.

Reference


Notes

1 Dr Robin Peace from the Ministry of Social Development, who spoke eloquently on mental health and housing, was unable to contribute a written chapter. The content of her presentation is developed in the 2002 Ministry of Social Development publication Mental Health and Independent Housing Needs, www.msd.govt.nz

2 www.hnz.co.nz/aboutus/initiatives/socialhousingstrat.htm
CHAPTER 1

Housing as a socio-economic determinant of Health: a Canadian research framework

James R. Dunn, Michael Hayes, David Hichkadzika,
Stephen Hwang & Louise Potvin

Socio-economic factors embedded in everyday life are widely acknowledged to be important determinants of health (Macintyre 1998; Lynch & Kaplan 1997) and housing is a crucial nexus for the operation of a wide range of socio-economic factors that fundamentally shape the character of everyday life for people across the socio-economic spectrum (Dunn 2000). It follows that the socio-economic dimensions of housing are a highly relevant focus for research into the socio-economic determinants of health.

Recent reviews of the literature on housing and population health (Hwang et al. 1999; Dunn 2000; Thomson et al. 2001), however, point to a dearth of research on relationships between these, despite convincing arguments of the potential of suitable housing for promoting health (Elway et al. 2001; Thomson et al. 2001; Maclennan & More 1999). These lacunae imply great potential for the study of housing and health relationships, although the conceptual underpinnings are arguably underdeveloped, creating a danger that research may not be adequately focused to provide concrete practical lessons. A conceptual framework, therefore, is an important first step in identifying needs, gaps and opportunities and to subsequently set research priorities which can inform policy-making by demonstrating the health effects of existing policies, and the health potential of housing interventions informed (in their design) by research.

A recent stakeholder consultation exercise conducted in Canada to assess research needs, gaps and opportunities in the area of ‘housing as a socio-economic determinant of health’ came in response to a request for proposals issued by the Institute of Population and Public Health (IPPH) of the Canadian Institutes of Health Research (CIHR). An interdisciplinary team from across Canada engaged a wide variety of stakeholders from both the housing and health sectors and asked them to assist us in identifying and prioritizing needs, gaps and opportunities in housing and health research (see Dunn et al. 2003).1

The most substantial parts of our consultation were a series of regional workshops we held in eight Canadian cities between September 2002 and January 2003 and an e-mail survey conducted in between May 2002 and October 2002. Although somewhat tailored to the Canadian context, the framework which guided the workshops has much more widespread relevance. In fact, the relative dearth of research on housing and health in Canada necessitated that the framework be developed on the basis of research from other similar industrialized countries (the United Kingdom, the United States, Australia and New Zealand).

Contemporary literature on socio-economic inequalities in health shows a strong relationship between an individual’s socio-economic status and their health status. This relationship appears to be independent of the measure of socio-economic status used (income, education, occupational grade) and appears to operate independently of most disease processes or illness states (Frank 1995). At all points during the twentieth century, steep social gradients in health have been observed for the conditions of the day: acute infectious diseases (tuberculosis, measles, cholera) dominates prior to the epidemiological transition and chronic, non-infectious diseases since then (heart disease, stroke, cancers, etc.) (Frank 1995). Explanations for the social gradient in health cannot be reduced to behavioural factors (smoking, diet, exercise), genetics, access to health care, or reverse causation (Wilkinson 1996). Nor is the relationship confined only to the margins of society: studies routinely find evidence that the social gradient in health spans the entire social spectrum.

Lynch and Kaplan (1997) have called for an ‘epidemiology of everyday life’. From this perspective, systematic social differences in health, biologically rooted in the physiological stress processes, are a response to systematic differences in the quality and stressfulness of everyday life. Questions are raised about the kinds of experiences which are stressful; in what contexts these translate into maladaptive physiological stress responses (whether the experience of stress is conscious or not); and how these factors come to be systematically distributed by social class.

If one accepts the foregoing arguments, it follows that housing should at
be a crucial lens through which we seek to understand socio-economic geographies of everyday life and their influence upon health. The framework which informed our stakeholder consultation, however, argues that housing is much more than just such a lens; it is also a nexus for the operation of unequal social relations and a medium through which socio-economic status is expressed and through which a wide range of known health determinants operate. These forces may be especially influential on the health and functioning of vulnerable and marginalised groups in society (e.g. seniors, children, people with disabilities and chronic illnesses, aboriginal groups).

Yet research on the socio-economic dimensions of housing and health is underdeveloped, relative to research on connections between biological, physical and chemical exposures in the home. It is also clear that there are crucial intersections between the biophysical and the socio-economic dimensions of housing, which only serve to heighten the urgency of further research on socio-economic dimensions of housing and health (see Dunn 2000 and Hwang et al 1999).

Major emphases in extant housing and health research

The bulk of the housing and health literature has been concentrated in three main areas:

1) Health selection, which refers to the selective availability, affordability, and suitability of housing for persons with existing illnesses;

2) Homelessness and health care, with emphases on both physical and mental health status as well as access to medical care and

3) the health impact of so-called 'pathological' aspects of housing conditions.

A fourth, emergent stream of research has focused broadly on socio-economic dimensions of housing and their association with health status.

Health selection and housing

The 'health selection' hypothesis has focused on whether [public] housing provision is health selective and if this phenomenon can account for the differential distribution of 'sick' and 'well' people across the housing stock (Smith 1990, p753). In the United Kingdom, there are public housing programs directed at people of 'medical priority' (Bicker 1988). Consequently there is an institutionalized policy that may differentially allocate relatively sick people to public housing.

Evidence of the health improvement after medical priority re-housing is scant and equivocal. Generally those re-housed on mental health grounds improve, but the evidence for persons with physical health conditions is mixed. In a sample of 41 persons re-housed for non-psychotic mental illness under medical priority, Elton and Packer (1987) found that mean severity of mental illness declined substantially for the sample after 30-90 days, and again slightly after one year. In a prospective randomized trial of medical priority re-housing for persons with affective neurotic symptoms, Elton and Packer (1986) showed "a clear benefit to mental health as a result of rehousing up to a year after that rehousing" in a sample of 17 subjects (p221). Over 80% (14) showed a marked decrease (50% or more) in their score on a validated mental health indicator.

Cole and Hatters (1996) evaluated a sample of Salford residents who had been re-housed on medical priority (m=25), almost exclusively for chronic physical ailments. In a three-year follow-up interview, 22.7% of respondents reported that they were satisfied with their new housing, and that their health had improved, 23.1% were satisfied with their housing but thought their medical condition had remained the same, and 13.9% were dissatisfied with their housing and thought their condition had remained the same.

Recent research concerns the performance of the medical priority system in correctly identifying those in legitimate need and placing them in appropriate accommodation (Robinson 1998; Smith 1990; Smith & Mallinson 1997; Smith et al 1997). By 'health selection', researchers in this field refer to the deliberately or inadvertently selective operation of the bureaucratic rules and procedures invoked to allocate housing or to dispense housing finance. The health selective effects of these rules and procedures may or may not be anticipated, and they may be directly or indirectly discriminatory (Smith 1990, p755).

Smith (1990), for instance, claims that allocations of housing on medical priority grounds "may be biased in favour of those among the medically deserving who are most skilled at mobilizing the medical priority system" (1990, p756). More generally, research indicates that people with health problems and other housing problems (e.g. homelessness) are disadvantaged by their multiple deprivation in the medical priority system (Robinson 1998). Informal practices within the British housing bureaucracy give the highest priority to applicants who only have health problems, because those with both health and housing problems have access into the social housing system by virtue of their housing needs as well (Smith et al 1997; Robinson 1998).
Those who have been recommended for medical priority re-housing on the grounds of a physical ailment are often given informal priority over those recommended for a mental health problem, Smith et al (1997) found that people with mental health problems are underrepresented in the social housing stock by 4.5%, while those with walking or vision disabilities are overrepresented by 5–10% (ibid 213). This is somewhat ironic given that the small amount of research on re-housing’s clinical effectiveness has demonstrated a clear positive impact for the condition of people with mental illness, while evidence of the effectiveness of re-housing for those with physical conditions is equivocal.

In addition to research on the operation of medical priority re-housing, Smith (1990) suggests that “the process of health selection out of housing and onto the streets merits much more attention from the research community” (ibid 755) While this focus has received some attention (Dear & Wolch 1987), a more common concern is with health status and access to health care among homeless persons (Brickner et al 1990), the second major area of housing and health research.

**Health (care) of homeless persons**

Clinical, disease-specific concerns dominate research concerning the health status and access to health care among homeless persons. There is a relatively large body of work reporting on health in general (Takahashi & Wolch 1994; Clarke et al 1995) and specific diseases like: AIDS (Rah et al 1990); tuberculosis (McAdam et al 1990; Gelberg et al 1997); hypertension (Plantier et al 1990); cardiovascular risk factors (Ober et al 1997); diabetes (Hwang and Buegea 2000); mortality (Hwang 2000; 2001; 2002); general health status of homeless children as well as cognitive development (Rubin et al 1996), health in general (Douglas 1996; Hwang 2001); and health services access and provision for homeless people (Somers 1992; Plumb et al 1996; Hwang et al 2001; Hwang 2000). There is also a large body of research specifically on mental illness among homeless persons, for example: the mental health status of homeless children (Conrad 1998b); mental illness among homeless in a suburban community (Haugland et al 1997); effects of homelessness on quality of life for severely mentally ill persons (Lehman et al 1995); and the mental health of single homeless people in hostels (Holland 1996).

In general, the health status of homeless persons has been found to be far worse than that of the general population. Rates of mental illness, HIV infection (Rah et al 1990), and physical violence (Burroughs et al 1992; O’Connell et al 1992) are all much higher.

Unfortunately, this week tends not to be concerned with root causes of homelessness, focusing instead on issues of prevalence and/or incidence of specific diseases and conditions, or issues of access to services. While these studies provide ample evidence of threats to health and barriers to health care associated with being homeless, it seems clear that housing could go a long way to alleviate the health problems so carefully documented. Indeed, many of the same factors that put individuals and families at risk for homelessness also threaten to undermine their health status.

**Physical, biological, and chemical exposures and housing**

The third area of existing research consists of investigations of the ‘pathological’ consequences of housing upon mental and physical health. Investigations of the former are typically concerned with links between mental health, illness and: crowding (Gabe & Williams 1983; Gove et al 1979; Fuller et al 1983); high-rise housing (Freeman 1993; Gilles 1977); housing type and location (McCarthy et al 1985); or a spectrum of housing conditions including dampness, cold, noise, crime, disrepair and crowding (Halpern 1995; Hopton & Hunt 1996; Spengler et al 1994; National Academy of Sciences 2000). Some of the major emphases in research on housing conditions and physical health include links between dampness and mould and respiratory disease (Brunkette et al 1989; Strachan 1993; Hopton and Hunt 1996; Hunt 1993; Dales et al 1997; 1999a; 1999b; Hyndman 1990; Hyndman 1998; Evans et al 2000; Miller & Day 1997; Sylander & Estel 1999; Dillon et al 1999); pest infestation and health (Howard 1993); fungal contamination and health (Dales et al 1998; Health Canada 1995; Miller et al 1988; Verheoef & Burge 1997) and cold and heat related illnesses (Collins 1993). There is a significant body of research on indoor air quality and health in Canada and the US, where exposure to dampness and mould is relatively common despite a drier climate than New Zealand and the UK.

The Canadian evidence on the health effects of physical, chemical, and biological exposures in the home has been thoroughly reviewed by Hwang et al (1999) and Fuller-Thompson et al (2000). Household exposure to lead, asbestos, radon, house dust mites and cockroaches all have strong or definitive evidence of an association with at least one medical outcome (Hwang et al...
HOUSING AS A SOCIO-ECONOMIC DETERMINANT OF HEALTH

1999 = also see National Academy of Sciences 2000). Urea formaldehyde foam insulation (UFFI), dampness and mould have a possible association with one or more health outcomes. Home hazards, such as stairs, heating systems and smoke detectors are all definitively linked to one or more health conditions, while carbon monoxide detectors can have a possible link with CO poisoning and a number of design features (building type, floor level, and high-rise structure) have a possible association with psychological distress. Household crowding/ density has a possible association with several health conditions.

Socio-economic dimensions of housing and health

Hwang et al (1999) point to a number of difficulties in attributing a causal relationship between socio-economic dimensions of housing and health. They correctly point to the need for:

a) a plausible explanation of mechanisms that could account for associations between housing and health,

b) adequate control for confounders (difficult to achieve in practice),

c) development of mechanisms that facilitate the development of housing interventions to improve health.

The three main areas of research addressing socio-economic dimensions of housing and health to date specifically focus on issues of housing affordability, housing tenure, and housing satisfaction/stress. As Hwang et al (1999) point out, the research to date on housing affordability and health has been inadequate to draw any conclusions. Few studies address this issue, except in some incidental manner, partly because data on housing affordability are not usually collected in health surveys. A recent exception is a study of housing, socio-economic status and health among 650 Vancouver households which found that both gross monthly housing expenses and housing expenses as a percentage of monthly income were associated with better self-reported health and lower likelihood of poor mental health (Dunn 2002). The association was stronger for housing expenses as a percentage of income. A similar study found no association between gross monthly housing expenditures and self-reported general health, health satisfaction or mental health (Dunn & Hayes 2000).

Although a good deal more research has been done on relationships between socio-economic dimensions of housing and health in the United Kingdom and New Zealand than in Canada, housing affordability has not always been addressed. Part of the reason for this insufficiency is that income is not measured in the British census (or in other British studies); social class, housing tenure and car access are more common measures of socio-economic status in the UK.

Numerous studies have examined the relationship between housing tenure and health (e.g. Füliki & Fox 1995). This is appropriate because housing tenure has long been an important social cleavage in British society. Despite its widespread use in studies of health inequalities, relatively little research has investigated the actual influence of housing tenure upon health (exceptions include Macintyre et al 1998; 2001). Macintyre et al (1998) suggest that there may be various possible mechanisms linking housing tenure and health; that renters may be systematically at greater risk of exposure to dampness, mould, and overcrowding and suffer attendant health outcomes as a result. But that renters may be systematically exposed to a greater degree of crime, lack of opportunity, etc. Issues related to "ontological security" (such as personalization and prestige in the home) are more directly related to tenure and have been linked to mental health and physical health (Saunders et al 1996; Kearns et al 2000).

The relationship between stress, mental health, and housing has been explored in three related papers on New Zealand housing (Kearns & Smith 1993; Smith et al 1993; Kearns et al 1992). The main finding is that housing stressors are "significantly associated with psychological distress" and that "living in a substandard dwelling represents an independent and additive source of stress to the lives of low-income residents" (Smith et al 1993, p 610). The experience of such stressors is an incomplete representation of the contribution of housing to the stress and health impacts persons marginalised in the housing market might experience. However, claims Kearns and Smith (1993): "the despair among these populations cannot be adequately described in a series of statistical tables and conceptual diagrams" (p 277). As such, they recommend extending this research through the use of ethnographic accounts of the experience of housing problems (ibid).

A recent review of studies involving housing interventions designed to create health improvements found only 18 such studies internationally (Thomson et al 2001). There was modest evidence of an effect, but the quality of evidence was inconsistent.
Developing a framework for housing as a socio-economic determinant of health

For the purposes of our stakeholder consultation, a framework for studying housing and population health by Dunn (2000: 2002a) was modified by the research team to frame existing research and to provide some initial direction for the workshop discussions. The framework (Table 1) identifies seven dimensions of housing (left column of Table 1) that have the potential to generate social inequalities, and health consequences, either directly or indirectly. Physical hazards, physical design, psychological benefits, social benefits, political dimensions, financial dimensions, and location of housing may combine with other types of social disadvantage and vulnerability among several population sub-groups to powerfully undermine health and human development. For a number of groups such as Canadian aboriginal peoples, people with mental illnesses and addictions, seniors, people with disabilities and chronic illnesses, and oftentimes women and visible minorities, the experience of poor housing, low SES and other aspects of social marginality are tightly linked and may severely compromise their health. This demands that the proposed framework be employed in a manner that is also sensitive to the question: "Are some groups in society more vulnerable to health effects of socio-economic dimensions of housing and domestic life?"

Dimensions and attributes of housing in the conceptual framework

Physical hazards

In terms of physical hazard dimensions of housing, there are clearly well-founded concerns about housing disrepair and exposure to toxins and hazards (moulds, dust mites, falls, etc) that substandard housing may entail. These are well-established in the literature, and the Canadian literature is particularly well-documented by Hwang et al (1999). The concern for the health impact of physical hazards underlies building codes and standards as well as many public programs. Canada's Residential Rehabilitation Assistance Program (RRAP), for example, is offered by a federal government agency to provide financial assistance to homeowners and landlords to bring their dwellings up to minimum health and safety standards. There is already a rich body of research on the health effects of physical hazards in the home, but a dearth of research on the intersection between physical hazards and socio-economic factors.

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<tr>
<th>Housing dimension</th>
<th>Socio-economic categories</th>
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<tr>
<td>Physical hazards</td>
<td>Owners/renters</td>
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<td>Physical design</td>
<td>Different income levels</td>
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<td>Psychological benefits</td>
<td>Family/household status</td>
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<td>Social benefits</td>
<td>(Dis)ability</td>
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<td>Political dimensions</td>
<td>Mental illness</td>
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<td>Financial dimensions</td>
<td>Life stage (particularly children &amp; seniors)</td>
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<td>Location</td>
<td>Gender</td>
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<td>Ethnicity/immigration</td>
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<td>Aboriginal status</td>
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Table 1: Housing, socio-economic status and health framework

To address this intersection would raise some of the following questions:
- Do people of lower socio-economic status experience a systematically greater exposure to biological, chemical and physical hazards in the home?
- Is there a systematic socio-economic bias in the capacity for households to redress such hazards, for example, through the uptake of housing improvement programs?

A recent British study suggests social and economic factors may substantially mediate the experience of health impacts even in the presence of empirically verifiable exposures. Evans et al (2000) found that the experience of respiratory symptoms among households exposed to moulds was significantly mediated by worry about mould. In short, the intersection between socio-economic and bio-chemical physical dimensions of housing is an avenue of research which presents a substantial opportunity.

Physical design

Aspects of physical design can contribute to health status in a variety of ways. Disrepair of stairs, floors, etc may create the possibility of falls and accidents, particularly for people with mobility and balance problems, while the absence of specialized adaptive equipment (e.g. handrails) or inadequate fire escape routes may also be threats. A review article by Evans and McCoy (1998) describe several dimensions of the design of indoor environments with potential relevance to health and known antecedents to health. They point out that high levels of complexity in design, for example, may result in "an overabundance
of stimulation”; similar effects may be the results of overcrowding and the encouragement of close proximity between occupants that is culturally inappropriate. Conversely, some design features may enhance the user’s sense of control (privacy, ability to alter the physical environment or regulate exposure to one’s surroundings), which workplace studies have shown to be positively associated with health. According to Evans & McCoy (1998), design features such as “the amount of available space, visual exposure, structural depth, openness of the perimeter, and extent of view have all been shown to moderate effects of crowding on human behavior” (p 89). The fields of landscape architecture, architecture, and environmental psychology conduct research on these topics, but it is not well-recognized in the housing and health literature, despite the existence of an active cadre of scholars and practitioners associated with the International Academy for Design and Health (www.designandhealth.com).

Psychological dimensions

Psychological dimensions of housing are well-recognized through the emphasis on the home as a site for the investment of meaning in environmental psychology and geography. First, the home is an important expression of identity, social status and prestige. Analyses of real estate advertising (Eyles 1987), show these are selling an identity as much as they are selling the physical structure of the house. Additionally, home ownership may provide an added sense of status and security that has long-term health benefits (Depres 1991; Smith 1994). Home ownership has traditionally been an accurate marker of socio-economic status in the UK, and consequently there have been several studies of the health effects of housing tenure (Macintyre et al 1998; 2001; 2003; Hiscock et al 2001). Some have argued that the relationship between socio-economic status and health is at least in part under-laid not just by people’s material circumstances per se, but also by the meanings people attach to their material circumstances (Wilkinson 1994). This proposition is mostly untested, but the importance of the home as a site for the investment of meaning would be a logical avenue for research.

The second major psychological dimension of housing relevant to health concerns the notion of control. There is already a large literature on job strain and health, which indicates that lack of control can be influential on the development of heart disease risk factors and can undermine mental health (Karasek & Thorell 1990). If control is important in the workplace, it follows that it should be important in the other 16+ hours of the day, much of which is spent in or near the home. Previous work has shown that control in the home is associated with self-rated and mental health status (Dunn & Hayes 2000; Dunn & Hayes 2000; Dunn 2001a; Grifflin et al 2002).

Social dimensions

The point has already been made that the home is an extremely important site for the investment of meaning. Part of this is due to the sociological significance of the boundary between the inside of the home and the outside world, something that is common to almost all cultures. As such, the home is an important site for the development and maintenance of social relationships, both with household members and others. The importance of social support is already very well established in the health literature as a significant determinant of health. It follows that there are important research questions that could be posed concerning the adequacy of individuals’ homes both for relationships between household members and for making and maintaining social ties with individuals living outside the household.

But one’s home is also the site in the landscape from which an individual’s situated daily life experience begins and ends, so that whether one lives (the dwelling and its socio-spatial context) may be influential in shaping individuals’ and households’ socio-economic opportunities, social status and identity (Harvey 1973; Badcock 1984). Some research has suggested that local social relations are important determinants of health (e.g. Haan et al 1987) and more recently, the arguments have been made for the importance of local social capital in the production of health (Kawachi & Kennedy 2003). Inssofar as the relative location of one’s home shapes access to local social supports and social capital, there may be important health consequences, but the influence of residential proximity and the geographic scale at which social capital may influence health are not yet well understood.

Political dimensions

There are two key ways in which our framework hypothesizes that political dimensions of housing may act as socio-economic determinants of health. In the first instance, housing quality, availability and affordability are (or can be) significantly influenced by public policy. A large portion of housing policy in Canada and a number of other Anglo-American countries is designed to
support home-ownership and ensure the vitality of the housing construction industry (the latter demonstrated by the heavy emphasis placed on housing starts as an economic indicator). Until the early 1990s, in addition to supporting home-ownership, Canada was also making fairly significant investments in public housing (although not at the same levels as many European countries and other ex-British colonies). But fiscal retrenchment in the early 1990s led to the near elimination of new investments in public housing, although support for home-ownership continued, and arguably increased (e.g. the Home Buyer’s Plan was introduced, allowing first-time home buyers to use RRSP funds for their down-payment). In Britain, Thatcherite policies resulted in a large-scale sell-off of Council housing stock, while in New Zealand, market-oriented reforms were introduced into public housing policy, for example the switch to market rents for public housing residents. In housing policy, who gets what, where and under what conditions?

The second way of thinking about the political dimensions of housing as a socio-economic determinant of health concerns the political struggle for neighbourhood conditions. All human activity must occupy some space, including the so-called locally unwanted land uses (LLUUs – e.g. industrial and waste disposal facilities, prisons’ half-way houses, residential care facilities, etc.). Lower socio-economic neighbourhoods typically bear the greater burden of unwanted land uses, partly due to their inability to marshal the political capital to resist them. Higher socio-economic neighbourhoods are better able, due to their political influence, education, financial resources, etc., to resist unwanted land uses, and additionally to informally and quietly demand a better package of neighbourhood amenities and insist on the maintenance of those amenities to a higher standard. Although these are common anecdotal observations that could be made in cities around the world, there is little research evidence to buttress such claims, much less to establish some connection between the forces of local politics and population health.

Financial dimensions

Financial dimensions of housing interact strongly with socio-economic status. It is well-established, but seldom explicitly recognized in housing and health research, that housing markets are powerful engines of inequality (Harvey 1973; Badcock 1984) which work to redistribute wealth and income in a highly regressive fashion. The key fulcrum on which this redistribution hinges in Canadian society is the distinction between owner-occupiers and renters of housing (Badcock 1984; Halchanski 2001). Indeed, there are several well-understood (but seldom tracked) pathways by which income and wealth are redistributed from renters to owners (e.g. capital gains tax exemption for the primary residence; other tax deductions, subsidies for home ownership, and the non-taxability of imputed rents). While numerous studies point to the relationship between income and health, it is likely that wealth is a better indicator of a household’s socio-economic status, and if so, this would underscore the importance of housing given that it is commonly the single most important asset of most households. Yet little has been written on the influence of inequalities in housing wealth on health inequalities. Recent exceptions include Macintyre et al (1998), Netleton & Burrows (1998), and Ostrove et al (1999).

Location

The locational dimensions of housing are potentially important to health because the home acts as a focal point for everyday activity. This means that one’s home and its immediate environment is likely to be the setting for exposure to a mix of positive and negative influences on health. One example of the importance of the locational dimensions of housing can be seen by considering the location of the home relative to services and amenities such as schools, public recreation facilities, health services, and job opportunities. This may also explain part of the so-called neighbourhood effects on health and human development seen in the research literature. Another important aspect of the spatial dimensions of home is the social environment it places one in, particularly with respect to social norms. Moreover, housing market dynamics confer significant locational advantages upon households in ways that systematically disadvantage households of lower SES. A location in space, a place to base one’s activities and existence, a place that provides access to goods, services, work, and recreation are important functions of housing – location matters.

Vulnerable populations

Most of the housing-related socio-economic factors thought to shape health are magnified for vulnerable sub-populations. Although the above framework for housing and health is a useful heuristic for unifying the experiences of
most Canadians, our team was cognizant of the fact that the socio-economic dimensions of housing relevant to health may manifest in the everyday lives of some sub-populations very differently than others. It was necessary for the team to ensure that the assessment of needs, gaps and opportunities in housing and health research took into consideration these differing experiences of those:

a) near the beginning (children); and b) end of life (seniors); c) for people with physical disabilities and chronic illnesses; d) for new Canadians; e) for visible minorities; f) for urban First Nations’ people; and g) for people with mental illnesses and mental disability. (Table 1)

Other relevant factors that differentiate the experience of housing and health (but do not necessarily constitute ‘vulnerability’) that were considered in our NGOA included gender, rurality, and household composition (e.g. family structure).

Our stakeholder consultation excluded homelessness from explicit consideration, using the same rationale as L’wungen et al. (1999) who argue that the health problems of people without housing do not logically belong in an analysis of relationships between housing and population health. This is not to deny that homelessness is an important area for health research, as there are literally hundreds of studies showing the acute health consequences of homelessness (Hwang et al. 1999), but a focus on homelessness would have detracted the focus of the consultation from important variations in housing conditions among people who are ‘housebound’ and their association with health status.

This kind of ‘upstream’ thinking is aptly demonstrated by the data in Table 2. It is drawn from the 1997 Calgary Homelessness Survey (Arboleda-Flórez & Holley 1997), a study conducted on one night in May 1997, in which a large number of interviewers went into the inner city of Calgary and attempted to interview every person sleeping in a homeless shelter or on the street. This particular table shows the 15 most common life events that respondents reported happened to them prior to becoming homeless. Several of these risk factors for homelessness are also known socio-economic risk factors for poor health. When we look ‘upstream’ from homelessness and upstream poor health, in other words, the ‘streams’ converge and we see a great coincidence of risk factors. It follows that intervention efforts directed to these upstream factors may help to prevent homelessness and poor health, whereas more ‘curative’ interventions (e.g. to get people out of homelessness and to restore their health once they become ill) are unable to address the underlying causal factors in the production of health and the production of homelessness.

Research priority areas
The feedback we received from workshop participants in our needs, gaps and opportunities assessment provided broad-based support for the conceptual framework described above. Four priority areas for research were highlighted:

1) economic aspects of housing and health;
2) questions concerning the health effects of housing over the lifespan; and
3) housing, social mix and social integration.

Economic aspects of housing and health
Stakeholders told us that there is a need for much more thorough research on several different financial aspects of housing and health status. At the household level, financial aspects of housing are particularly important. Because income, which is commonly used in existing research on socio-economic status and health, only accounts for household revenues and not household expenditures, income gradients in health quite likely underestimate the steepness of the social gradient in health. If well done, studies with complete household budgets (revenues and expenditures), as well as housing wealth (equity) effects may help to indirectly estimate the magnitude of health benefit that could accrue to lower income households if policies were implemented to reduce the financial burden of housing. The notion that low-income households with a large housing cost burden may compensate by reducing other potentially health-enhancing expenditures (e.g. diet, recreation, home repairs) in their budget, thereby ‘discounting’ their health, resonated strongly with participants (Cheer

![Table 2: Life events prior to homelessness. (The total in this column does not add up to 100 as more than one factor could be identified by each respondent. Sample size was 250.)](image)
et al 2002; Howden-Chapman et al 2000). Related to this, additional research is needed on the health consequences of renting vs. owning. In terms of financial advantages, it is well known that wealth is redistributed through housing through tax benefits and other public subsidies to homeowners. What would be the impact of directing some of those subsidies to renters to reduce rent burdens? What are the best options? Do they make a difference to reducing the ‘discounting’ of health?

In terms of relationships between home-ownership and health, the research team and workshop participants agreed that home-ownership is a relatively crude measure that undoubtedly hides important differences among home-owners and renters. Without more information on the context of home ownership in surveys that contain both housing tenure and health status information, it is impossible to move much beyond a simple association between housing tenure and health status. What is required is an ‘unpacking’ of the notion of housing tenure. This requires the identification of the social, economic, psychological benefits (or burdens) that home ownership brings, measuring them qualitatively and quantitatively, and by costing them strengthen the political will.

Participants suggested that research be used to identify the specific attributes of housing which make a difference to health and other social outcomes, particularly for vulnerable populations. They articulated this as a trade-off between spending on housing or spending on other social programs, for example supports for people with mental illnesses and disabilities, other social services, or even prisons. If we monitor the spending/saving impacts of providing housing and support (community services/facilities) then it may be possible to assess the impact of housing on health. The bottom line is that it is necessary to devote resources to studies that address these issues. Recent research by Eberle and Kraus et al (2001) for the B.C. provincial government showed that the health, social services and criminal justice systems bear considerable costs due to homelessness. More research of this kind needs to be done.

Housing and health over the life course

An emphasis on the life course, particularly the beginning and the end of life, was seen by workshop participants as important for housing and health research. With respect to children, there are direct effects of exposure to physical, chemical and biological hazards that must be considered, but children in lower socio-economic status households may be more likely to be exposed to such hazards, possibly creating a ‘multiple jeopardy’ effect. Other direct effects on child development concern the location, design and amenities of housing. An example of indirect effects of housing on child development is through the impact of parental stress. Housing, according to such a hypothesis, can be linked to patterns of parent-child attachment. Parent-child attachment, in turn, is a very strong predictor of future emotional, social, economic and physical wellbeing for children. Studies conducted in the United States have already provided preliminary evidence of these kinds of relationships (Evan et al 2001a; 2001b). Additionally, a recent study has shown that substandard housing is commonly a factor in children being taken into care by the state in the Toronto area (Chau et al 2001). A focus on children’s living conditions and developmental outcomes (e.g. emotional and social development, cognitive development, physical development) represents a particularly underdeveloped area of research.

Seniors are another population sub-group for whom housing can be a challenging issue, particularly for seniors of lower socio-economic status. Many seniors are poor, may have chronic illnesses, and are vulnerable to social isolation. There is a wealth of research on seniors’ housing, some of which investigates relationships to health, or more commonly, to functional status, cognitive function and competency. Key research issues that remain, however, include: housing affordability; research tools for rapid, inexpensive, but accurate identification of seniors at-risk for functional incompetence; interventions to alleviate social isolation both for those who are housebound and those who are not; and identification of obstacles and barriers to house modifications to prevent falls and reduce hazards in seniors’ homes (Park & Robertson 2000; Winter & Gutman 1997; Milhailidis 2002).

Integration and social mix

A growing body of research suggests a relationship between residential segregation and health and human development outcomes (e.g. Acevedo-Garcia 2000; Waitzman & Smith 1998). Similarly, a number of studies now suggest that neighbourhood level socio-economic factors may exert an independent influence upon health and human development, independently of an individual’s own socio-economic status (DesRous et al 2001); Brooks-Gunn et al 1993). These findings beg questions about neighbourhood and site planning for social mix,
and the social and health outcomes that may be produced. Preliminary evidence suggests that living in socially mixed neighbourhoods is beneficial for children from poor families (Brooks-Gunn et al. 1993). To date, however, there are no known systematic evaluations of initiatives to create social mix, and this is therefore an area of great research potential (see Cole & Goodchild 2001; Vischer 1986). There is some evidence that 'social integration' may create better outcomes for people with chronic mental illness, but there is still a strong tendency for such individuals to live in highly segregated neighbourhoods. An important question that was raised in a number of the workshops on the prairies was the issue of rising urban Aboriginal segregation, which has become quite severe. What will be the health and social consequences of such patterns?

Conclusion

There remain many unanswered although highly relevant questions when one considers the issue of relationships between housing and health, with an emphasis on socio-economic dimensions of housing. The findings of our stakeholder workshops only reinforced the need for more research on such questions. But this need is not passive research. New housing developments, urban regeneration projects, and neighbourhod gentrification occur frequently in most large cities in the industrialized countries of the world, and these represent excellent opportunities for very relevant research – research that can assess the effects of changes in housing upon health and known antecedents to good health (e.g. social support, labour force attachment, social capital, etc.). Additionally, the existence of gaps in current knowledge does not imply that we must necessarily wait for research results to come in before acting. It is possible to act upon the principles that can be derived from current research (indeed, that is what is done in urban planning almost every day), so long as the results of these actions are carefully monitored.

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