

The Relationship Between Housing Conditions and Health Status of Rooming House Residents in Toronto

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ABSTRACT

Background: Rooming houses are an important source of housing for low-income Canadians. Little information is available on the relationship between housing conditions and health status in this vulnerable population.

Methods: Interviews were conducted with a representative sample of 295 residents in 171 rooming houses in Toronto. Health status was assessed using the SF-36. The physical attractiveness of each rooming house was rated using the Multiphasic Environmental Assessment Procedure. Associations between the health status of residents and the physical attractiveness and organizational characteristics of rooming houses were examined.

Results: Rooming house residents aged 35 years and older had significantly poorer health status than their counterparts in the Canadian general population. Eight of the ten dimensions of individual health status assessed by the SF-36 were significantly correlated with the physical attractiveness of the rooming house in which the individual lived. However, there was no significant association between residents' health status and the rooming house's non-profit status, provision of meals, or the presence of an on-site landlord.

Conclusions: Rooming house residents suffer from a high prevalence of ill health. Residents reporting worst health are concentrated in rooming houses in the poorest physical condition. This relationship may be mediated by selection processes that place the sickest individuals in the lowest-quality rooming houses, and/or by a direct effect of adverse housing conditions on health status. Further research is needed to elucidate these processes and to improve the health of this vulnerable population.

La traduction du résumé se trouve à la fin de l'article.

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Among low-income individuals, adverse housing conditions are an important determinant of health.¹ In Canadian cities, rooming houses compose a significant source of housing for the poor,² with more than 26,000 people living in rooming houses in 1996.³ Recent increases in homelessness in North America have been attributed in part to the ongoing loss of low-cost housing typified by rooming houses.^{4,5}

Little information is available on the health of rooming house residents. Previous reports have emphasized factors that adversely affect the health of these individuals, including poverty, social isolation, poor nutrition, and substance abuse.⁶⁻¹⁰ However, data have been lacking on the relationship between housing conditions and health status in this vulnerable population.

Rooming houses are often quite diverse in their physical characteristics such as size, building condition, and neighbourhood setting.^{2,11-13} They also vary in their organizational characteristics such as provision of meals and non-profit status. Rooming houses range from extremely adverse physical and social environments to good-quality housing.

It is plausible, yet unproven, that the physical and organizational characteristics of a rooming house are correlated with the health of its residents. This correlation could be mediated through either selection processes or the direct effect of housing on health. Personal preferences (either tenant or landlord), economic constraints, social networks, and other forces generate selection processes that concentrate certain kinds of tenants in particular rooming houses.¹⁴ For example, individuals with severe addictions may live in lower-quality rooming houses because they allocate less money for housing. Landlords of higher-quality rooming houses may selectively rent to individuals who are healthier and higher functioning.² Individuals may seek housing close to their existing social networks, creating a selection effect at the neighbourhood level. Finally, individuals may be assigned to certain housing environments because of pre-existing health conditions. For example, in Toronto, some individuals with mental illness are placed in selected rooming houses that receive supplemental funding to enable them to better serve these clients' needs (the "Habitat Program").

Additionally, housing conditions may have adverse or beneficial effects on health.¹ Sanitation, ventilation, and heating clearly can affect health. Residents of rooming houses that provide meals may have better nutritional status, leading to better health. A network of social supports within a rooming house could exert beneficial health effects.

Regardless of the mediating process, individuals in the poorest health would be expected to live in rooming houses with the most adverse physical and social environments. This would have significant implications for efforts to improve the health of this vulnerable population. The objectives of this study were to describe the health status of a representative sample of English-speaking residents of rooming houses in Toronto, Ontario, and to determine whether physical and organizational characteristics of rooming houses are correlated with the health status of their residents.

METHODS

Subject selection

In Toronto, rooming houses are defined as residential dwellings that contain four or more rental units with shared use of a bathroom and/or kitchen.¹⁵ Study subjects were selected from among the 424 licensed rooming houses in Toronto in 1997, which had a total maximum occupancy of 4,809 individuals. Unlicensed rooming houses were not included in this study, as there was no reliable method of identifying these establishments.

From the list of licensed rooming houses, residences were stratified according to the following characteristics: 1) provision vs. non-provision of meals, 2) owner-occupied vs. absentee landlord, 3) participation vs. non-participation in the Habitat program, and 4) for-profit vs. non-profit status. A 6% proportionate random sample of residents was selected in each stratum.

Eight interviewers, all of whom had lived in rooming houses, were trained to administer surveys. Subjects were selected for recruitment by randomly identifying particular rooms within specific rooming houses. Surveys were conducted between August and December 1998. All study participants gave written, informed con-

TABLE I
Characteristics of Rooming House Residents, Overall and by Gender

Characteristic	Overall n=295	Men n=249	Women n=46	p-value
Age, mean (years)	40.6	41.3	37.2	0.071
Ethnic group				
White	82.3	83.5	73.9	0.104*
Non-white	17.7	16.5	26.1	
Black	8.5	7.2	15.2	
Aboriginal	2.4	2.0	4.3	
Asian	3.4	2.8	6.5	
Other	3.4	4.0	0	
Marriage status				
Single, never married	63.7	64.0	62.2	0.038
Divorced/separated	27.7	29.1	20.0	
Married/common-law	6.5	5.7	11.1	
Other	2.1	1.2	6.7	
Education level				
Grade school	11.9	12.4	8.7	0.017
Some high school	34.6	34.5	34.8	
High school graduate	18.6	21.3	4.3	
Some university	20.0	18.9	26.1	
University graduate	14.9	12.9	26.1	
Employment status				
Unemployed	66.0	69.4	47.8	0.005
Employed	34.0	30.6	52.2	
Monthly income, mean (\$)	962	950	1037	0.529
Ever homeless in lifetime				
Yes	35.6	36.1	32.6	0.645
No	64.4	63.9	67.4	
Homeless in past 5 years				
Yes	23.1	24.5	15.2	0.120
No	76.9	75.5	84.8	
Smoking status				
Daily smoker	56.6	58.6	45.7	0.187
Occasional smoker	5.4	5.6	4.3	
Non-smoker	38.0	35.7	50.0	
Alcohol consumption past year				
None	33.6	32.1	41.3	0.603
≤ Once a month	7.1	6.8	8.7	
Once a month	6.4	5.2	13.0	
2-3 times a month	10.2	9.6	13.0	
Once a week	11.2	12.4	4.3	
2-3 times a week	16.9	16.9	17.4	
4-6 times a week	4.7	5.6	0	
Every day	9.8	11.2	2.2	
Ever had drinking problem				
Yes	31.7	33.9	20.0	0.066
No	68.3	66.1	80.0	
Substance use in past year				
None	68.9	68.4	71.7	0.419
One substance	17.1	18.2	10.9	
≥ Two substances	14.0	13.4	17.4	

* Comparison of ethnic groups was based on the categories of white and non-white. Figures shown are percentages, unless otherwise indicated. P-value is shown for the comparison between men and women. Gender comparisons were made using independent sample t-tests for continuous variables and Pearson chi-square for categorical variables.

sent, and received a \$15 honorarium. If a potential subject could not be contacted, refused to participate, could not communicate in English, or could not complete the survey, another resident at the same rooming house was approached at random. Ninety-one interviews could not be completed because the interviewer could not enter the rooming house, the rooming house was no longer in operation, or no resident at the rooming house was willing to participate. In these cases, a resident at a different rooming house was selected randomly. The St. Michael's Hospital Research Ethics Board approved this study.

Survey instruments

Information was collected on demographic characteristics, health status and conditions, and health determinants. Health status was measured using the SF-36, a validated instrument consisting of eight subscales and two summary scales of physical and mental health.¹⁶⁻¹⁸ Chronic health conditions were self-reported using questions from the 1996-97 National Population Health Survey (NPHS).¹⁹ Use of cigarettes, alcohol, and illicit drugs in the past 12 months were also self-reported.²⁰

Physical characteristics of each rooming house were assessed using a physical attractiveness subscale from the Multiphasic

TABLE II
Physical and Mental Health Status Among Rooming House Residents in Toronto

Age Group (n)	Overall Physical Health		Overall Mental Health	
	Mean ± SD	Difference	Mean ± SD	Difference
18-24 years (n=42)	53.3 ± 6.2	...	49.9 ± 9.1	...
25-34 years (n=76)	51.5 ± 7.2	-1.5	50.1 ± 12.1	0
35-44 years (n=69)	45.5 ± 11.5	-6.5 *	42.4 ± 13.8	-8.5 *
45-54 years (n=50)	44.4 ± 10.1	-6.9 *	41.8 ± 14.4	-9.6 *
55-64 years (n=35)	39.0 ± 11.0	-10.0 *	48.2 ± 13.2	-5.5 *
65-74 years (n=20)	42.7 ± 12.1	-4.5 *	46.5 ± 11.7	-7.2 *
All ages (n=295) **	47.0 ± 10.6	-3.5	46.5 ± 13.1	-5.2 *

Overall physical health and mental health scores were measured by the SF-36 (best possible health = 100). "Difference" is the rooming house residents' mean score minus the Canadian norm for that age group; negative values indicate poorer health among rooming house residents.

Ellipses (...) indicate that normative data for the Canadian population not available for this age group.

* Clinically and statistically significant difference based on meeting all three of the following criteria: absolute difference ≥ 3 , $p \leq 0.05$ by t-test, and absolute difference in coefficients of variation ≥ 5.0 .

** Age groups do not sum to total because data not shown for ages 75 and up and age missing for one individual.

TABLE III
Prevalence of Chronic Conditions Among Rooming House Residents and the Canadian Population

Chronic Condition	Rooming House Residents (n=294)†	Canadian General Population (n=147,111)‡	Canadian Low-income Population (n=4055)‡
Back problems, not arthritis	23.5	15.9 ***	22.7
Migraine headaches	17.9	7.7 ***	11.2 ***
Arthritis or rheumatism	17.2	15.7	23.9 **
High blood pressure	14.4	11.1	13.8
Sinusitis	13.4	4.8 ***	6.8 ***
Asthma	11.9	6.4 ***	9.9
Urinary incontinence	8.3	1.7 ***	3.5 ***
Chronic bronchitis & emphysema	7.9	2.8 ***	6.0
Stomach or intestinal ulcers	7.3	2.9 ***	6.1
Heart disease	6.9	4.5 *	7.5
Epilepsy	3.6	0.6 ***	1.6 **
Diabetes	2.7	3.6	5.5 *
Glaucoma	2.7	1.2 *	1.6
At least one chronic condition§	60.7	46.5 ***	56.6

* Prevalence significantly different from that of rooming house residents, $p \leq 0.05$

** Prevalence significantly different from that of rooming house residents, $p \leq 0.01$

*** Prevalence significantly different from that of rooming house residents, $p \leq 0.001$

† Prevalence rates are age- and sex-standardized to the low-income population in the National Population Health Survey (NPHS) 1996-1997. One subject is excluded in this analysis because his age was unknown.

‡ Prevalence rates based on NPHS 1996-1997 data for adults aged 20 and over. Low-income population is defined as those in the lowest income quintile.

§ Chronic conditions include those listed, plus cancer, stroke, and cataracts.

Environmental Assessment Procedure (MEAP) Rating Scale. Based on interviewers' ratings of the building, grounds, noise levels, odours, and cleanliness, the rating scale yields a measure of physical attractiveness that ranges from 0 to 100.²¹ In validation studies of the MEAP, facilities that were rated as more attractive by observers were found to have more resources available to residents, and were considered more comfortable by its residents.²¹ The physical attractiveness scale has a test-retest reliability of 0.66 and yields a Cronbach's alpha of 0.82.²¹

Statistical methods

Residents' SF-36 scores were compared to Canadian general population norms.²²

Because SF-36 scores follow a non-Normal distribution, differences between rooming house residents and population norms were considered significant if they met the following criteria: 1) an absolute difference of ≥ 5 in subscale scores (≥ 3 in summary scores),^{17,18} 2) $p \leq 0.05$ for the two-sample t-test for comparison of means, and 3) an absolute difference in the coefficients of variation ≥ 5.0 .

Using 1996-97 NPHS data, chronic disease prevalence rates among rooming house residents were directly standardized to the age-sex distribution of low-income members of the general population. Standardized rates among rooming house residents were compared to the general

population using a two-sample test for binomial proportions.

Associations between residents' SF-36 scores, organizational characteristics of the rooming house, and the physical attractiveness of the rooming house were examined using the Mann-Whitney test (categorical variables) or the Spearman correlation coefficient (continuous variables). All statistical analyses were performed using SPSS 10 (SPSS Inc., Chicago, IL).

RESULTS

Interviews were completed with 295 residents living in 171 rooming houses. Rooming house residents were quite heterogeneous in their demographic characteristics (Table I). Women were more likely than men to be married or living common-law, employed, and have post-secondary education. In all age groups 35 years and over, roomers had significantly worse overall physical and mental health status than their counterparts in the general population (Table II). There was a non-significant trend towards poorer health status among male compared to female rooming house residents (data not shown).

Self-reported prevalence rates of chronic conditions are shown in Table III. Ten chronic conditions were more common among rooming house residents than in the Canadian general population. Given rooming house residents' low monthly income (mean \$962), this disparity could be related to the inverse correlation between income level and prevalence of chronic health problems.²³ However, when compared to individuals in the lowest income quintile of the Canadian general population, migraine headaches, sinusitis, urinary incontinence, and epilepsy remained significantly more prevalent among rooming house residents.

Relationships between the physical attractiveness and organizational characteristics of rooming houses are shown in Table IV. Rooming houses operated on a non-profit basis were more likely to have higher physical attractiveness scores. There was no significant association between monthly rent paid by tenants and physical attractiveness score (Spearman rho = -0.06, $p=0.379$).

The physical attractiveness of a rooming house was significantly correlated with

eight of ten dimensions of residents' individual health status (Table V). Individuals reporting poorest health tended to live in rooming houses in the worst physical condition. This association was strongest for overall physical health status, general health perceptions, and physical functioning.

Most organizational characteristics of rooming houses were not associated with the health of residents. Not surprisingly, residents in Habitat program rooming houses, who are selected on the basis of severe and persistent mental illness, had significantly lower scores on a number of health status domains. Other organizational characteristics, including the provision of meals, the presence of an on-site landlord, and non-profit status, were not significantly associated with the health status of residents.

DISCUSSION

Rooming houses are an important source of affordable housing in Canada. While most rooming house residents have low incomes, they are surprisingly diverse demographically. A surprising 15% of all rooming house residents were university graduates, and 34% were currently employed, including more than half of the women. Thus, while rooming house residents are often assumed to be unemployed or disabled, we found that many residents were the "working poor."

Nevertheless, our data support the assertion that rooming houses provide low-cost housing for a vulnerable population. About one quarter of rooming house residents had been homeless within the last 5 years. For these individuals, loss of their room could easily send them back into a homeless shelter or onto the street. Furthermore, rooming house residents have much poorer health status than the general population, even when compared to individuals in the lowest income quintile. Rooming house residents therefore represent an extremely disadvantaged group, likely due to complex factors beyond poverty alone. Even in a system providing healthcare for all, living in a rooming house should be considered a marker of high risk for poor health, similar to homelessness.²⁴

A major goal of this study was to identify physical and organizational characteris-

TABLE IV
Association Between Organizational Characteristics and Physical Attractiveness of Rooming Houses in Toronto

Organizational Characteristic	Physical Attractiveness Mean (SD)	P-value
Overall	62.06 (17.21)	n/a
Rooming house size		0.259
Small, up to 12 rooms (n=66)	60.1 (17.0)	
Medium, 13 to 30 rooms (n=74)	62.6 (17.4)	
Large, more than 30 rooms (n=12)	68.5 (17.4)	
Meals provided on-site		0.166
Yes (n=18)	67.3 (15.4)	
No (n=135)	61.4 (17.4)	
Non-profit home		0.030
Yes (n=22)	69.4 (15.8)	
No (n=131)	60.8 (17.2)	
On-site landlord		0.095
Yes (n=18)	68.4 (16.0)	
No (n=135)	61.2 (17.2)	
Participation in Habitat program		0.891
Yes (n=8)	61.2 (12.5)	
No (n=145)	62.1 (17.5)	

TABLE V
Correlation Between SF-36 Health Status of Rooming House Residents and Physical Attractiveness Scores of Rooming Houses

SF-36 Health Status Scale	Spearman Correlation Coefficient to Physical Attractiveness Score	P-value
Overall physical health (PCS)	0.277	<0.001
General health perceptions	0.275	<0.001
Physical functioning	0.263	<0.001
Bodily pain	0.197	0.001
Role functioning, physical	0.170	0.005
Energy and vitality	0.169	0.006
Mental health	0.155	0.011
Role functioning, emotional	0.137	0.025
Overall mental health (MCS)	0.105	0.087
Social functioning	0.104	0.090

Health status scales are listed in order of strength of correlation with physical attractiveness

tics of rooming houses that are associated with the health status of residents, under the rationale that these could be used to target segments of the rooming house population in greatest need. Interestingly, organizational characteristics such as non-profit status and provision of meals were not correlated with residents' health. In contrast, a very strong correlation was found between the physical attractiveness of a rooming house and the health of its residents. Thus, seeking out the most obviously dilapidated rooming houses will effectively identify those individuals with the greatest health needs.

This study had certain limitations. We were unable to examine the characteristics of the 91 individuals who were unable or unwilling to participate in the study. In addition, this study included only licensed rooming houses. Anecdotal experience suggests that housing conditions in unlicensed rooming houses are often substandard. However, tenants and advocacy groups are reluctant to report these establishments for

fear that they will be shut down, resulting in a further loss of affordable housing.²⁵ Assuming this study's findings are generalizable to illegal rooming houses, such closures would likely impact a group of vulnerable individuals in poor health. Municipal governments should be encouraged to enable landlords to bring unlicensed and/or substandard rooming houses into compliance with licensing requirements. If, as a last resort, a rooming house must be closed, efforts to relocate tenants should take into account the vulnerable health status of these individuals.

Because of this study's cross-sectional design, the observed correlation between a rooming house's physical condition and the health status of its residents cannot be assumed to be causal. Additional work is needed to delineate the selection processes that concentrate people in poor health in certain kinds of housing.¹⁴ Future research should measure the health status of individuals at the time they first move into a rooming house and to track longitudinal

changes in their health status. Such work could help clarify the question of whether the concentration of people with poor health in poor-quality housing is the result of selection processes or the direct effects of housing on health. Furthermore, prospective studies are needed to determine whether interventions based on health care delivery or socio-economic support are more effective in improving the health of this and other disadvantaged urban populations.

REFERENCES

- Fuller-Thomson E, Hulchanski JD, Hwang S. The housing/health relationship: What do we know? *Rev Environ Health* 2000;13:109-33.
- Campsie P. Perception vs. reality in the world of rooming houses. In: Rooming Houses in the City of Toronto: Three Recent Studies. Toronto: City of Toronto Housing Department Publishing Workgroup, 1996.
- Statistics Canada. Population in collective dwellings, 1996 Census. www.statcan.ca/english/Pgdb/People/Families/famil62b.htm. Accessed November 13, 2001.
- Jencks C. *The Homeless*. Cambridge: Harvard University Press, 1994.
- O'Flaherty B. *Making Room: The Economics of Homelessness*. Cambridge: Harvard University Press, 1999.
- Kendall PRW. Accessibility Study of Rooming House Residents. Toronto: Department of Public Health, City of Toronto, 1992.
- The Health Care Needs of Inner City Rooming House Residents. Toronto: Street Health Community Nursing Foundation, 1990.
- Babiski L, Sidle N, McColl M. Challenges in achieving health for all in the boarding home sector. *Can J Occupational Ther* 1996;63:33-43.
- By Ourselves: A Case Study of Cityhome's Low Income Singles. Toronto: Alternative Housing Subcommittee, City of Toronto, 1984.
- Campsie P. Housing, Low-Income Tenants, and the Commonsense Revolution: The First Twelve Months. Toronto: Housing Department Publishing Workgroup, City of Toronto, 1996.
- Jim Ward Associates. South St. Jamestown Needs Assessment Study. City of Toronto, 1989.
- Jim Ward Associates. Making rooms into homes: An evaluation of Toronto's Rupert Pilot Project. City of Toronto, 1993.
- Siegel H. A descriptive portrait of the S.R.O. world. In: Erickson J, Wilhelm C (Eds.), *Housing the Homeless*. Rutgers: State University of New Jersey, 1986.
- Smith SJ. Health status and the housing system. *Soc Sci Med* 1990;31:753-62.
- Rooming House Handbook. Toronto: Information and Advisory Services Section, City of Toronto Housing Department, 1993.
- Ware JE, Jr., Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992;30(6):473-83.
- Ware JE, Snow KK, Kosinski M, Gandek B. SF-36 Health Survey: Manual and Interpretation Guide. Boston: The Health Institute, New England Medical Center, 1993.
- Ware JE, Kosinski M, Keller SD. SF-36 Physical and Mental Health Summary Scales: A User's Manual. Boston: The Health Institute, New England Medical Center, 1994.
- Information about the national population health survey*. Catalogue No.: 82F0068XIE. Ottawa: Statistics Canada, 1999. Available at: <http://www.statcan.ca/english/freepub/82F0068XIE/free.htm>
- Kessler RC, Mroczek D. UM-CIDI Mental health screening scales. Ann Arbor, MI: Institute for Social Research, University of Michigan, 1994.
- Moos RH, Lemke S. Evaluating Residential Facilities: The Multiphasic Environmental Assessment Procedure. London: Sage Publications, 1996.
- Hopman WM, Towheed T, Anastassiades T, Tenenhouse A, Poliquin S, Berger C, et al. Canadian normative data for the SF-36 health survey. Canadian Multicentre Osteoporosis Study Research Group. *CMAJ* 2000;163(3):265-71.
- Evans RG, Barer ML, Marmor TR (Eds.), *Why Are Some People Healthy and Others Not? The Determinants of Health of Populations*. Hawthorne, NY: Aldine de Gruyter, 1994.
- Hwang SW. Homelessness and health. *CMAJ* 2001;164:229-33.
- Simpson B. The Report of the Rooming House Review, City of Toronto. Toronto, September 1992.

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RÉSUMÉ

Contexte : Les maisons de chambres sont une importante source de logements pour les Canadiens à faible revenu. Or, on en sait très peu sur la relation entre les conditions de logement et l'état de santé dans ce segment vulnérable de la population.

Méthode : Nous avons interviewé un échantillon représentatif de 295 résidents de 171 maisons de chambres de Toronto. Leur état de santé a été évalué grâce à l'outil SF-36. Nous avons évalué l'aspect esthétique de chaque maison de chambres à l'aide de l'instrument MEAP (Multiphasic Environmental Assessment Procedure), puis les associations entre l'état de santé des résidents, l'aspect esthétique des maisons de chambres et leur organisation.

Résultats : L'état de santé des personnes de 35 ans vivant en maison de chambres était sensiblement moins bon que celui des 35 ans et plus dans la population canadienne générale. Huit des 10 dimensions de l'état de santé individuel évaluées par le SF-36 présentaient une corrélation significative avec l'aspect esthétique de la maison de chambres où vivait la personne en question. Nous n'avons cependant constaté aucune association significative entre l'état de santé des résidents et le but lucratif ou non lucratif des maisons de chambres, le fait que les repas soient compris ou non, ou la présence ou l'absence du propriétaire sur les lieux.

Conclusions : La prévalence des problèmes de santé chez les résidents des maisons de chambres est élevée. Les résidents dont l'état de santé déclaré était le pire étaient concentrés dans les maisons de chambres les plus délabrées. Cette relation pourrait s'expliquer par des méthodes de sélection qui placent les plus malades dans les pires maisons, et/ou par l'effet direct des conditions de logement indésirables sur l'état de santé. Il faudrait pousser la recherche pour élucider ces mécanismes et améliorer la santé de ce segment vulnérable de la population.