

LETTERS

CROWDING AS A POSSIBLE FACTOR FOR HEALTH OUTCOMES IN CHILDREN

A recent study by Martens et al. found that children residing in social housing tend to display poorer health and educational outcomes than children who live outside of social housing. In addition, it was found that better outcomes in adolescence were associated with residing in social housing within wealthier neighborhoods.¹ Although the results of this study provide clear implications for government policies and programs for social housing, crowding must also be considered as a factor. The authors note that many applicants for Manitoba Housing do not obtain a residence in their preferred location due to the size of the dwelling required.¹ However, the study does not address the rates at which crowding occurs in this social housing program, whether as a result of limited availability or the socioeconomic status of the neighborhood in which families must live.

The effects of household crowding have been previously demonstrated and include: poor mental health status,² reduction of coping strategies,³ increased risk of childhood injuries,⁴ exposure to respiratory issues and



University of Michigan School of Engineering senior William Royster, age 21 years, stands with the words “#Black Lives Matter” covering his mouth, as he is surrounded by students laying on the ground during the Die-In Protest at the University of Michigan in Ann Arbor, Michigan, on December 10, 2014. Photograph by Patrick Record. Printed with permission of AP Photo/The Ann Arbor News.

infectious diseases,⁵ and poor school performance.⁶ As a result, it is necessary to determine whether social housing in poorer neighborhoods features higher rates of crowding than is experienced in wealthier areas and whether this leads to an increase in the adverse health effects and poorer educational outcomes experienced by individuals living in these areas.

The study conducted by Martens et al. noted that individuals living in social housing in poorer neighborhoods typically experienced more adverse education and health outcomes.¹ Perhaps if the authors had considered crowding within their study, they may have found that crowding accounts for at least some of the differences observed in health and education outcomes in social housing in lower socioeconomic neighborhoods.

Because previous studies have indicated that household crowding causes many adverse health and education outcomes independently of social housing programs or neighborhood socioeconomic status, it is

possible that the effects of any one of these factors might exacerbate the effects of the others. Studies highlighting the differences in health and education outcomes based on socioeconomic status of neighborhoods are a step in the right direction; however, further conclusions are needed regarding the impact of crowding. Until each of these factors is considered together, significant changes made to social housing programs will have only limited impact on negative health and education outcomes experienced by children and families living in social housing. ■

Dakota J. Inglis, MPHc

About the Author

Dakota J. Inglis is a Faculty of Medicine graduate student at Memorial University, St. John's, Newfoundland.

Correspondence should be sent Dakota J. Inglis P.O. Box 333, Hubbards, Nova Scotia, Canada B0J 1T0 (e-mail: di6654@mun.ca). Reprints can be ordered by visiting <http://www.ajph.org> and clicking on the “Reprints” link.

*This letter was accepted November 4, 2014.
doi:10.2105/AJPH.2014.302458*

Letters to the editor referring to a recent Journal article are encouraged up to 3 months after the article's appearance. By submitting a letter to the editor, the author gives permission for its publication in the Journal. Letters should not duplicate material being published or submitted elsewhere. The editors reserve the right to edit and abridge letters and to publish responses.

Text is limited to 400 words and 10 references. Submit online at www.editorialmanager.com/ajph for immediate Web posting, or at ajph.edmgr.com for later print publication. Online responses are automatically considered for print publication. Queries should be addressed to the Editor-in-Chief, Mary E. Northridge, PhD, MPH, at men6@nyu.edu.

References

1. Martens PJ, Chateau DG, Burland EMJ, et al. The effect of neighborhood socioeconomic status on education and health outcomes for children living in social housing. *Am J Public Health*. 2014;104(11):2103–2113.
2. Gove WR, Hughes M, Galle OR. Overcrowding in the home: an empirical investigation of its possible pathological consequences. *Am Sociol Rev*. 1979;44(1):59–80.
3. Fuller TD, Edwards JN, Vorakitphokatorn S, Sermisri S. Stress and psychological well-being: evidence from Thailand on household crowding. *Soc Sci Med*. 1996;42(2):265–280.
4. Delgado J, Ramirez-Cardich ME, Gilman RH, et al. Risk factors of burns in children: crowding, poverty, and poor maternal education. *Inj Prev*. 2002;8(1):38–41.
5. Cardoso MR, de Goes Siqueira LF, Alves FM, D'Angelo LA. Crowding: risk factor or protective factor for lower respiratory disease in young children? *BMC Public Health*. 2004;4(19):1–8.
6. Roy AL, Raver CC. Are all risks equal? Early experiences of poverty-related risk and children's functioning. *J Fam Psychol*. 2014;28(3):391–400.

MARTENS ET AL. RESPOND

Inglis provides an interesting alternative explanation for the association between location of social housing and health and educational outcomes presented in our research.¹ The emphasis on crowding as a possible confounder is one that was brought up in early iterations of the research: are housing units in more affluent areas more crowded than housing units in less affluent areas? One of the authors (G. S. F) of our paper points out that the National Occupancy Standards are also those used for social housing managed by the province of Manitoba. These standards set the following requirements: (1) not less than 1 and not more than 2 persons may occupy a single bedroom, (2) parents and children do not use the same bedroom, (3) single persons aged 18 years and older have a separate bedroom, and (4) children aged 5 years and older do not share a bedroom with another person of the opposite gender.^{2,3} These strict standards do not lend themselves to the kinds of crowded living conditions noted by Inglis, and detrimental effects of crowding would be rare in Manitoba's social housing.

Additionally, we were able to calculate the number of people per bedroom occupying social housing units for the samples used in our paper. There was no significant difference in

the number of people per bedroom when stratifying Community Centre Areas by income quintile ($P=.46$): quintile 1 (lowest), 2.0 people per bedroom ($SD=0.05$); quintile 2, 2.0 people per bedroom ($SD=0.19$); quintile 3, 1.9 people per bedroom ($SD=0.23$); quintile 4, 1.8 people per bedroom ($SD=0.23$); and quintile 5 (highest), 1.8 people per bedroom ($SD=0.51$). An analysis at the individual level resulted in an r^2 of only 0.01 between people per room in housing units and Community Centre Area–income quintile. With such a weak relationship, it is not possible for differential crowding between neighborhood income quintiles to explain the effects that were found.

We point out that any effect of crowding in social housing should also appear in preschool ages, which we did not find (see our results for the Early Development Instrument⁴). If anything, residing in social housing could possibly decrease crowding compared with private housing alternatives. It is still possible that crowding could partly contribute to the differences between individuals in social housing and those not in social housing, but it cannot account for differences among social housing residents in different income quintiles in our analyses. Overcrowding is an important variable when studying housing in general, and that could influence other studies on housing. However, we are confident that our results were not an artifact of differential crowding by neighborhood. ■

Patricia J. Martens, PhD
Daniel G. Chateau, PhD
Elaine M. J. Burland, PhD
Gregory S. Finlayson, PhD
Mark J. Smith, MSc
Carole R. Taylor, MSc
Marni D. Brownell, PhD
Nathan C. Nickel, PhD
Alan Katz, MB, ChB, MSc
James M. Bolton, MD
PATHS Equity Team

About the Authors

Patricia J. Martens, Daniel G. Chateau, Elaine M. J. Burland, Gregory S. Finlayson, Mark J. Smith, Carole R. Taylor, Marni D. Brownell, and Nathan C. Nickel, are all with the Manitoba Centre for Health Policy, Department of Community Health Sciences, College of Medicine, Faculty of

Health Sciences, University of Manitoba, Winnipeg. Alan Katz is also associated with the Department of Family Medicine, University of Manitoba, Winnipeg. James M. Bolton is associated with the Department of Psychiatry, Department of Psychology, Department of Community Health Sciences, College of Medicine, Faculty of Health Sciences, University of Manitoba, Winnipeg, and Manitoba Centre for Health Policy, University of Manitoba, Winnipeg.

Correspondence should be sent to Patricia Martens, Distinguished Professor, or Dan Chateau, Assistant Professor, Manitoba Centre for Health Policy, Department of Community Health Sciences, College of Medicine, Faculty of Health Sciences, University of Manitoba, 409-727 McDermot Avenue, Winnipeg, Manitoba, Canada R3E 3P5 (e-mail: pat_martens@cpe.umanitoba.ca; dan_chateau@cpe.umanitoba.ca).

*This letter was accepted November 7, 2014.
 doi:10.2105/AJPH.2014.302460*

Contributors

All authors contributed equally to this letter.

Acknowledgments

The PATHS Equity Team is funded by a Canadian Institutes of Health Research grant.

References

1. Martens PJ, Chateau DG, Burland EMJ, Finlayson GS, Smith MJ, Taylor CR, Brownell MD, Nickel NC, Katz A, Bolton JM, PATHS Equity Team. The effect of neighborhood socioeconomic status on education and health outcomes for children living in social housing. *Am J Public Health*. 2014;104(11):2103–2113.
2. Manitoba Government. Housing and Community Development. Available at: <http://www.gov.mb.ca/housing/mh/progs/pil.html#how2>. Accessed November 5, 2014.
3. Canada Mortgage and Housing Corporation. Housing in Canada Online: Definitions. Available at: http://cmhc.beyond2020.com/HiCODefinitions_EN.html#_Suitable_dwellings. Accessed November 6, 2014.