Mediating Effects of Social Support and Internalized Homonegativity on the Association Between Population Density and Mental Health Among Gay and Bisexual Men

Demetria N. Cain, MPH,^{1,2} Chloe Mirzayi, MPH,^{1,3} H. Jonathon Rendina, PhD, MPH,^{1,4,5}
Ana Ventuneac, PhD,^{1,6} Christian Grov, PhD, MPH,^{1,3} and Jeffrey T. Parsons, PhD^{1,4,5}

Abstract

Purpose: Depression negatively impacts the health and well-being of gay and bisexual men (GBM). However, little is known about the contexts in which rural GBM live relative to those living in urban areas and their overall mental health. The aim of this study was to examine associations between population density and depressive symptoms and the role of internalized homonegativity and social support as potential mediators.

Methods: A nationally representative sample of 1071 GBM (mean age = 40.24) was enrolled. Participants provided their zip codes, which were categorized according to population density and rank-normalized.

Results: In a path analysis model adjusted for race/ethnicity, college education, age, and relationship status, higher population density was significantly associated with increased social support ($B = 0.11$, $P = 0.002$) and decreased internalized homonegativity ($B = -0.06$, $P < 0.001$). In turn, lower social support ($B = -2.93$, $P < 0.001$) and greater internalized homonegativity ($B = 4.93$, $P < 0.001$) were significantly associated with greater depressive symptoms. The indirect effects of population density on depression through social support ($B = -0.33$, $P < 0.001$) and internalized homonegativity ($B = -0.31$, $P < 0.001$) were statistically significant, suggesting evidence for mediation of the effects.

Conclusions: These results indicate that living in less inhabited areas acts on depressive symptoms through mechanisms of lower social support and higher internalized homonegativity. These findings suggest that social contexts in which GBM live can affect mental health outcomes and indicate the need for further support and inclusion of GBM, especially in less inhabited areas.

Keywords: internalized homonegativity, men who have sex with men, minority stress, mental health, population density, social support

Introduction

AMONG THE GENERAL population, research examining the role of living in an urban versus rural setting in mental health outcomes has found mixed results, with some studies finding higher depression among those living in rural areas^{1,2} and others finding no differences between urban and rural areas.^{3–5} Structural factors, such as lack of mental health treatment services or greater distances to providers, in more rural settings may be a contributing factor.^{6,7} More-

over, the social environment provides a context in which different social factors—including family, friends, and work—could affect mental health. For some, living in a more rural setting allows one to experience greater community connectedness by virtue of smaller social networks.⁸ For minority populations, the social context within urban/rural settings becomes particularly important for psychological well-being due to exposure to stress resulting from various forms of stigma,⁹ including racial stigma,¹⁰ spatial stigma,^{11,12} and structural sexual minority stigma.¹³

¹Center for HIV/AIDS Educational Studies and Training, Hunter College of the City University of New York (CUNY), New York, New York.

²Community Health Sciences Doctoral Program, Community Health Sciences, University of Illinois at Chicago School of Public Health, Chicago, Illinois.

³Department of Community Health and Social Sciences, CUNY Graduate School of Public Health and Health Policy, New York, New York.

⁴Department of Psychology, Hunter College of the City University of New York (CUNY), New York, New York.

⁵Health Psychology and Clinical Science Doctoral Program, The Graduate Center of the City University of New York (CUNY), New York, New York.

⁶Division of Infectious Diseases, Department of Medicine, Icahn School of Medicine at Mount Sinai, New York, New York.

Compared with heterosexuals, sexual minorities such as gay and bisexual men (GBM) have a disproportionately higher risk for depression,^{14–16} with rates that are often 1.5 times greater,¹⁷ which, in turn, is associated with increased odds of alcohol and drug use as well as with HIV transmission risk behaviors.^{17–19} Structural forms of sexual minority stigma, such as institutional policies and laws (e.g., lack of employment nondiscrimination policies and religious freedom exemption laws), are known to increase sexual orientation concealment, which can keep GBM from accessing HIV prevention programs²⁰ and increase levels of psychiatric distress.^{21–23} The minority stress theory suggests that social environments are settings where stigma, sexual prejudice, discrimination, and their associated stressors exacerbate negative mental health outcomes.^{24,25} Internalized homonegativity is a minority stressor that results from the interaction of the individual with larger social factors.^{26,27} It is theorized to occur when sexual minorities internalize expectations of societal homophobic attitudes and discrimination and develop self-loathing attitudes,^{26,28–30} and it affects mental health when possessing negative feelings about one's sexual orientation increases concealment and expectations of future rejection.^{31–34}

In contrast, social support can mitigate negative effects of minority stress and foster self-acceptance by providing group solidarity and cohesiveness.³⁵ Being connected to lesbian, gay, and bisexual (LGB) communities is known to facilitate the benefits of social support on mental health.^{36,37} Although it is well established that internalized homonegativity and social support affect GBM mental health,^{31,38–40} relationships,⁴¹ and sexual health,^{34,42} what is less known is the role of place and geographic variations affecting mental health outcomes through these psychological processes.²⁷ They could potentially mediate the relationship between place and mental health because they are generated within social environments.

Most of what we know about GBM comes from those living in urban epicenters, and far less is known about GBM living outside of urban centers.^{43,44} One of the primary reasons for this is that it is logistically challenging to study non-urban GBM due to geographic dispersion across rural areas and relative invisibility of sexual minority individuals outside of urban settings.⁴⁵ Because of these difficulties, research on sexual minorities sampled from non-urban settings has primarily relied on convenience samples at Gay Pride events, snowball samples, and internet-based recruitment.⁴³

Researchers have documented the negative effects of being gay and living in more rural settings.^{45–47} A U.S. population-based study to examine the association between geographic location and health disparities among sexual minorities found higher rates of mental distress among rural GBM compared with both rural heterosexual men and non-rural GBM.⁴⁸ Research points to hostile social environments and the negative effects of stigma as playing a key role in more rural settings.^{47,49} Although sexual orientation-based discrimination exists in urban settings,⁵⁰ there may be more opportunities for sexual minorities to cope with sexual orientation discrimination in more urban settings. The relatively small number of sexual minorities in less densely populated areas may increase feelings of social isolation,⁴⁶ result in greater concealment of sexual orientation,⁵¹ limit access to social networks, and mean fewer places to socialize with others of similar sexual identity.^{45,46}

Research examining place effects often utilize metropolitan statistical areas (MSAs) or Rural Urban Commuting Area Codes (RUCAs), which are categorized or dichotomized for comparisons.^{4,48,52,53} In addition to logistical concerns recruiting GBM in rural areas, there are also challenges when attempting to compare urban and rural GBM because they have historically lived in more urbanized settings.⁵⁴ Dichotomizing place as urban or rural can often blur place heterogeneity, particularly in more urban settings, that has importance in health outcomes research.⁵⁵ Utilizing a perspective that examines the spectrum of urban and rural settings allows for determining differences across a continuum. Examining population density is one approach that may allow for comparisons within locales with different characteristics that may otherwise have been classified homogeneously under MSAs and RUCA codes. This approach can be particularly important when examining the features of place that are indicative of a social context for GBM.

Using a panel study of GBM across the United States, we aimed at investigating the role of place across the urban/rural continuum by examining the association between population density and depression among GBM. Through population density, we allow for further consideration of the impact of heterogeneity of place on GBM mental health outcomes. We also examined the direct and indirect effects of internalized homonegativity and social support on the relationship between population density and depression. This allows for further attention to be directed toward the pathways in which mental health is affected by place effects and the connection between systemic oppression based on sexual orientation and mental health outcomes.

Methods

Participants and procedures

Participants were enrolled in the *One Thousand Strong* panel, a longitudinal study following a U.S. national sample of GBM. Participants were recruited via Community Marketing and Insight's (CMI) panel of more than 22,000 GBM, gathered from advertisements on LGB-specific and non-specific websites. CMI is able to target specific individuals based on pre-specified characteristics and invite them to participate in research studies. CMI invited 9011 GBM to complete a screening survey. To be eligible for enrollment in *One Thousand Strong*, men had to complete three enrollment milestones.⁴³ They had to screen eligible for enrollment ($N=1375$), complete an at-home computer-assisted self-interview (CASI) ($N=1268$), and complete at-home HIV and sexually transmitted infection testing with a post-test CASI.⁵⁶ Eligibility criteria included living in the United States with a permanent U.S. mailing address, being 18 years and older, being male assigned at birth and identifying as male, self-identifying as gay/bisexual, having English comprehension, having internet access to complete online CASI surveys, self-identifying as HIV negative (confirmed during HIV testing), and having a male partner in the past year. The final enrolled sample comprised 1071 HIV-negative GBM. The City University of New York Institutional Review Board reviewed and approved study procedures. Participants reviewed the informed consent and provided consent online.

Measures

Measures of demographics, population density, internalized homonegativity, social support, depression, and zip code were collected during screening and an hour-long at-home baseline CASI survey.

Demographic characteristics. Participants were asked to report race/ethnicity, age, annual income, sexual orientation (whether bisexual or gay), relationship status (partnered or single), and highest education grade completed.

Population density. Participants provided their zip code during enrollment. Zip codes were categorized for their population density by using Census 2010 data. Because the distribution of participants was positively skewed, population densities were ranked and normalized by using the Rankits algorithm in SPSS (IBM Corporation, Armonk, NY), an established methodology for ranking and normalizing data.⁵⁷ Eleven participants (1%) had missing Census 2010 population data because the participants resided in zip codes that had been created after the 2010 United States Census, used a business address in a non-residential zip code, or resided in a U.S. territory or outlying area. Population densities for these participants were estimated by using neighboring zip codes or, in the case of the participant in a U.S. territory, district-level population density.

Internalized homonegativity. Participants reported their internalized homonegativity by using the Internalized Homophobia Scale.⁵⁸ The nine-item scale asks participants to report whether they strongly disagree (1) to strongly agree (4) with such questions as, "I often feel it is best to avoid personal or social involvement with other gay/bisexual men," and "I have tried to stop being attracted to men in general." Responses were averaged to form an overall score ($\alpha = 0.88$).

Social support. Participants reported their perception of social support by using the 12-item Multidimensional Scale of Perceived Social Support.⁵⁹ Questions included, "There is a special person who is around when I am in need," "I can talk about my problems with my family," and "I can talk about my problems with my friends." Responses were measured on a seven-point Likert Scale from Very Strongly Disagree (1) to Very Strongly Agree (7) and averaged ($\alpha = 0.92$).

Depression. Participants reported depressive symptomatology by using the 20-item Center for Epidemiologic Studies Depression (CESD) scale, with items measured on a four-point Likert scale as rarely or none (0) to most or all (3) of the time.^{19,60} Typically, the CESD asks about the presence of symptoms within the past week. However, to match the timeframe of assessment with the period of other study outcomes, the scale was adapted to ask about symptoms in the "last 3 months" as has been done in previous studies with GBM.^{61–63} Responses were summed with a possible range of 0–60, with higher scores indicating more symptomatology ($\alpha = 0.93$).

Analysis plan

Using Census 2010 data, population densities were obtained from participant zip codes, ranked, and finally normalized by using Rankits. We then examined descriptive

statistics of the demographic characteristics (sexual orientation, age, race/ethnicity, education, income, and relationship status) and bivariate associations between these variables and the variable of interest by using one-way analysis of variances (ANOVAs) as well as Pearson correlations. In the case of significant ANOVA results, Tukey-adjusted post hoc analyses were conducted. After descriptive and bivariate analyses, we conducted path analysis by using *Mplus* 7.3⁶⁴ to better understand the indirect effects of population density on depressive symptoms through internalized homonegativity and social support. The path analysis allowed social support and internalized homonegativity to correlate in the model.

Results

Bivariate associations

The final analytic sample contained 1071 HIV-negative GBM. Tables 1 and 2 present the demographic characteristics of the sample as well as the bivariate correlations of variables of interest. Ages ranged from 18 to 79 ($M = 40.24$, standard deviation = 13.84). Men who identified as multiracial or other race had significantly higher internalized homonegativity compared to white men. A 4-year degree was associated with increased social support and decreased depressive symptoms compared with men without a degree. Relationship status was associated with all three predictors of interest, with partnered men reporting lower internalized homonegativity, higher social support, and lower depressive symptoms, on average. Population density, internalized homonegativity, social support, and depressive symptoms were significantly correlated with each other. Internalized homonegativity and depressive symptoms were directly associated, whereas social support and depressive symptoms were inversely associated and had the strongest correlation. As ranked population density increased, generally internalized homonegativity and depressive symptoms decreased modestly whereas social support scores increased with the smallest effect size that was still significant.

Path analysis

In a model of depressive symptoms containing population density but no mediators, population density explained 7% of the variance in depressive symptoms. The results of the fitted path analyses are presented in Figure 1. In the fitted model containing social support and internalized homonegativity as mediators, there was no significant direct effect between population density and depressive symptoms. Population density was associated with social support and internalized homonegativity, with a direct relationship between population density and social support ($B = 0.11$) and an inverse association between population density and internalized homonegativity ($B = -0.06$). As seen in the figure, both social support and internalized homonegativity were directly related to depressive symptoms ($B = -2.93$ and $B = 4.93$, respectively). A test of the indirect effect of population density through social support yielded a significant result ($B = -0.33$), whereas a similar test for population density through internalized homonegativity was also significant ($B = -0.31$). Overall, the fitted model explained 22% of the variance in depressive symptoms, 15% of the variance in social support, and 5% of the variance in internalized homonegativity.

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE AND DIFFERENCES IN SCALE SCORES

Characteristic	N = 1071		Internalized homonegativity		Social support		Depression	
	n	%	M	SD	M	SD	M	SD
Sexual orientation			$F(1, 1069) = 21.11^{***}$		$F(1, 1069) = 1.45$		$F(1, 1069) = 0.19$	
Gay	1017	95.0	1.35	0.46	5.19	1.27	16.50	11.72
Bisexual	54	5.0	1.65	0.56	5.00	1.45	15.80	9.21
Race/ethnicity			$F(3, 1067) = 3.78^{**}$		$F(3, 1067) = 0.93$		$F(3, 1067) = 1.53$	
White	763	71.2	1.33 ^a	0.46	5.19	1.27	16.06	11.24
Black	83	7.7	1.41 ^{ab}	0.50	5.06	1.40	16.94	12.38
Latino/a	135	12.6	1.38 ^{ab}	0.49	5.30	1.23	16.98	12.41
Multiracial or other	90	8.4	1.50 ^b	0.55	5.06	1.34	18.67	12.53
Education			$F(1, 1069) = 2.46$		$F(1, 1069) = 6.19^*$		$F(1, 1069) = 15.27^{***}$	
No 4-year degree	474	44.3	1.38	0.51	5.07	1.37	18.01	12.35
Four-year degree or higher	597	55.7	1.34	0.44	5.27	1.20	15.24	10.84
Income			$F(1, 1069) = 2.46$		$F(1, 1069) = 6.19^*$		$F(1, 1069) = 15.27^{***}$	
<\$30k	334	31.2	1.42	0.50	4.95	1.38	21.19	12.24
\$30k or more	737	68.8	1.33	0.46	5.29	1.22	14.32	10.65
Relationship status			$F(1, 1069) = 8.93^{**}$		$F(1, 1069) = 16.33^{***}$		$F(1, 1069) = 87.00^{***}$	
Single	549	51.3	1.40	0.53	4.75	1.39	18.22	11.81
Partnered	522	48.7	1.31	0.41	5.63	0.97	14.62	11.11

Means with differing superscripts within columns differed significantly ($P < 0.05$) in Tukey-adjusted post hoc analyses.

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

M, mean; SD, standard deviation.

Discussion

GBM residing in less densely populated areas reported higher depressive symptoms compared with GBM in more densely populated areas. Lower population density appeared to have an indirect effect on increased depression through pathways of increased levels of internalized homonegativity and lower social support. Lower population density may mean living in a social context that is stigmatizing toward sexual minorities. Areas with fewer people may mean fewer LGB residents as well, fewer opportunities to interact with sexual minorities, and reinforced perceptions about homosexuality being immoral.⁶⁵ In these social contexts, GBM may encounter more micro-aggressions and homonegativity, which can be internalized to affect one's sense of self-worth. GBM will often conceal their sexual identity when there is a threat of discrimination,^{20,23} which may limit how they engage with others or seek supportive services.

Although the support of family and friends can help GBM counter the negative mental health outcomes of experiencing internalized homonegativity, there may be fewer opportuni-

ties to experience social support in less densely populated areas, with limited proximity to other sexual minorities and local LGB-supportive resources. Conversely, living in a more densely populated area may afford more opportunities to connect with others with similar identities, which increases social support, limits internalized homonegativity, and limits depressive symptoms overall.⁶⁶ Structural barriers of living in less populated areas could also mean fewer mental health providers for all residents, and this could have further implications for GBM who have a disproportionately higher risk for depression.¹⁴⁻¹⁶

These research findings are similar to other work conducted with gay men in non-urban settings, including several qualitative studies. Gay men in rural Australia have been found to have lower life satisfaction, lower social support, more psychological distress, and greater concern about being accepted.⁵¹ An ethnographic examination of stigma and social isolation among sexual minorities in rural settings found that they often experienced marginalization and victimization for being different and not conforming to heteronormative values.⁸ Similarly, themes of intolerance

TABLE 2. CORRELATIONS BETWEEN VARIABLES OF INTEREST AND SCALE DESCRIPTIVE STATISTICS

Variable	1	2	3	4	5
1. Age	—				
2. Population density ^a	-0.02	—			
3. Internalized homonegativity	-0.14***	-0.12***	—		
4. Social support	-0.10***	0.08**	0.27***	—	
5. Depression	-0.17***	-0.10**	0.32***	-0.37***	—
Mean	40.24	0.00	1.36	5.18	16.46
Standard deviation	13.84	1.00	0.48	1.28	11.61
Cronbach's α	—	—	0.88	0.92	0.93

^aPopulation density was ranked and then normalized by using Rankits.

** $p \leq 0.01$, *** $p \leq 0.001$.

FIG. 1. Adjusted path analyses of variables of interest. Model was adjusted for race/ethnicity, relationship status, college education, and age (i.e., all endogenous variables were regressed on these demographic factors); ** $p \leq 0.01$, *** $p \leq 0.001$.

and potential discrimination were sources of concern for GBM residing in suburban areas and affected how they operationalized their sexual minority identities in these settings, including how they display affection in public.^{67,68} This study supports these findings, emphasizing that developing ways to create social networks and build social support are especially important for habituating in non-urban settings.

Research examining place effects for GBM often compare those living in urban versus rural settings or other, similar categorical comparisons.^{48,51,69,70} Reducing the urban-rural continuum to a dichotomous predictor masks the variability in urban and rural contexts. This research supports efforts to move beyond examining gay men in gay urban enclaves and to consider the role that different contexts play in how gay men develop and navigate their identities as sexual minorities.^{44,67,68} This research demonstrates that the association between mental health and place effects occurs across the continuum of increasingly or decreasingly populated areas. Higher depression rates are not limited to rural settings only and can occur in less populated areas that are not deemed to be either urban centers or rural settings. The population density continuum is particularly important for GBM samples to further distinguish men who live in urban centers from those who may live in smaller towns or suburban areas. This research contributes to the importance of considering the heterogeneity of places where GBM live and expanding research beyond strictly urban centers to other forms of urban spaces and their impact on sexual identity and mental health.⁴⁴

The findings of this research have implications for mental health delivery, public health practice, and policy. Mental health professionals working with GBM in less densely populated areas are urged to link clinical presentation of internalized homonegativity and depression with experiences of social stigma and discrimination and to assist GBM in ways to foster more social support to counter the negative effects of these experiences. The internet and social media become particularly important mechanisms whereby non-urban GBM can connect with others of similar interests and identities in virtual spaces.^{71,72} Public health programs should take the social and sexual environments of rural gay men into ac-

count and consider ways to increase service accessibility.⁷³ For example, the internet may serve as an effective setting in which to deliver HIV prevention education because a virtual space allows GBM living in rural settings to access preventive services while keeping their sexual identity anonymous.⁴⁷ Finally, many rural GBM are living in areas with no legal protection against sexual orientation-based discrimination.⁷⁴ It is imperative that policy makers not discount the lives of rural sexual minorities and understand how the lack of these protections affects mental health outcomes.

Limitations

This study had several limitations that should be considered. First, the zip codes provided by the participants represent their mailing address and may not reflect where GBM spend most of their time. It is possible that some participants spend a significant amount of their time or socialize in zip codes with varying population densities. Between realms of home, work, and social spaces, a person is exposed to several social contexts and mailing zip codes may not account for this. Second, population density does not consider the context or spatial location where zip codes are located, a limitation further discussed by others.⁵⁵ A lower population density zip code may be an LGB-affirming community (for example, Provincetown, MA). Zip codes with lower population density may be situated in close proximity to larger metropolitan areas and may be more similar to these areas than other rural areas. The RUCA classification system accounts for proximity of rural spaces to larger metropolitan areas. However, we found RUCA codes to be ineffective for this national sample to distinguish variability between classification groups, given that 88% of our sample was classified in RUCA area 1. However, further exploration determined that many living in RUCA area 1 were actually living outside of urban centers and, thus, could be subjected to differing social contexts. Third, this research did not examine mental health factors through a structural perspective whereby specific stigma indicators could be tested to be associated with mental health. Instead, this research used population density

as a proxy measure for specific contextual indicators related to place effects. Finally, although these findings come from a national sample of GBM, the population sampled is limited in its generalizability to all GBM.

Conclusion

The pathways by which place effects impact the mental health of GBM occur through increased internalized homonegativity and lack of social support in lower population density areas. For less densely populated areas, population density may represent social contexts where GBM are less socially accepted and individuals feel isolated by not being around others with similar sexual identities. Fostering ways for men living in less populated areas to be more socially included remains important. Until there is a time when heteronormative values do not preclude sexual minorities from being socially isolated, which can increase homonegativity, there will continue to be a need for more support and inclusion of sexual minorities, especially in less inhabited areas.⁶⁹

Acknowledgments

The *One Thousand Strong* study was funded by the National Institutes of Health/National Institute on Drug Abuse (NIDA) (R01 DA 036466: J.T.P. and C.G.). H.J.R. was supported by an NIDA Career Development Award (K01 DA039030). The authors would like to acknowledge other members of the *One Thousand Strong* Study Team (Dr. Tyrel Starks, Mark Pawson, Andrew Cortopassi, Ruben Jimenez, Brett Millar, Thomas Whitfield, and Raymond Moody) and other staff from the Center for HIV/AIDS Educational Studies and Training (Chris Hietikko, Doug Keeler, Brian Salfas, Chris Murphy, and Carlos Ponton). They would also like to thank the staff at Community Marketing, Inc. (David Paisley, Thomas Roth, and Heather Torch). Finally, special thanks are due to Dr. Jeffrey Schulden at NIDA.

Disclaimer

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Author Disclosure Statement

No competing financial interests exist.

References

1. Probst JC, Laditka SB, Moore CG, et al.: Rural-urban differences in depression prevalence: Implications for family medicine. *Fam Med* 2006;38:653–660.
2. Breslau J, Marshall GN, Pincus HA, Brown RA: Are mental disorders more common in urban than rural areas of the United States? *J Psychiatr Res* 2014;56:50–55.
3. Kessler RC, McGonagle KA, Zhao S, et al.: Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Arch Gen Psychiatry* 1994;51:8–19.
4. Brossart DF, Wendel ML, Elliott TR, et al.: Assessing depression in rural communities. *J Clin Psychol* 2013;69:252–263.
5. Kessler RC, Berglund P, Demler O, et al.: The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *JAMA* 2003;289:3095–3105.
6. Hauenstein EJ, Petterson S, Merwin E, et al.: Rurality, gender, and mental health treatment. *Fam Community Health* 2006;29:169–185.
7. Hartley D, Britain C, Sulzbacher S: Behavioral health: Setting the rural health research agenda. *J Rural Health* 2002;18 Suppl:242–255.
8. Watkins F, Jacoby A: Is the rural idyll bad for your health? Stigma and exclusion in the English countryside. *Health Place* 2007;13:851–864.
9. Pearlin LI: The sociological study of stress. *J Health Soc Behav* 1989;30:241–256.
10. Tatum BD: Family life and school experience: Factors in the racial identity development of Black youth in White communities. *J Soc Issues* 2004;60:117–135.
11. Keene DE, Padilla MB: Race, class and the stigma of place: Moving to “opportunity” in Eastern Iowa. *Health Place* 2010;16:1216–1223.
12. Kelaher M, Warr DJ, Feldman P, Tacticos T: Living in ‘Birdsville’: Exploring the impact of neighbourhood stigma on health. *Health Place* 2010;16:381–388.
13. Hatzenbuehler ML, Link BG: Introduction to the special issue on structural stigma and health. *Soc Sci Med* 2014;103:1–6.
14. Lewis NM: Mental health in sexual minorities: Recent indicators, trends, and their relationships to place in North America and Europe. *Health Place* 2009;15:1029–1045.
15. Gilman SE, Cochran SD, Mays VM, et al.: Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey. *Am J Public Health* 2001;91:933–939.
16. Mays VM, Cochran SD: Mental health correlates of perceived discrimination among lesbian, gay, and bisexual adults in the United States. *Am J Public Health* 2001;91:1869–1876.
17. King M, Semlyen J, Tai SS, et al.: A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry* 2008;8:70.
18. Lacefield K, Negy C, Schrader RM, Kuhlman C: Comparing psychosocial correlates of condomless anal sex in HIV-diagnosed and HIV-nondiagnosed men who have sex with men: A series of meta-analyses of studies from 1993–2013. *LGBT Health* 2015;2:200–220.
19. Millar BM, Starks TJ, Grov C, Parsons JT: Sexual risk-taking in HIV-negative gay and bisexual men increases with depression: Results from a U.S. national study. *AIDS Behav* 2017;21:1665–1675.
20. Pachankis JE, Hatzenbuehler ML, Hickson F, et al.: Hidden from health: Structural stigma, sexual orientation concealment, and HIV across 38 countries in the European MSM Internet survey. *AIDS* 2015;29:1239–1246.
21. Hatzenbuehler ML, McLaughlin KA, Keyes KM, Hasin DS: The impact of institutional discrimination on psychiatric disorders in lesbian, gay, and bisexual populations: A prospective study. *Am J Public Health* 2010;100:452–459.
22. Hatzenbuehler ML: Structural stigma and the health of lesbian, gay, and bisexual populations. *Curr Direc Psychol Sci* 2014;23:127–132.
23. Frost DM, Parsons JT, Nanin JE: Stigma, concealment and symptoms of depression as explanations for sexually transmitted infections among gay men. *J Health Psychol* 2007;12:636–640.

24. Meyer IH: Minority stress and mental health in gay men. *J Health Soc Behav* 1995;36:38–56.
25. Meyer IH: Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Bull* 2003;129:674–697.
26. Russell GM, Bohan JS: The case of internalized homophobia theory and/as practice. *Theory Psychol* 2006;16:343–366.
27. Puckett JA, Horne SG, Herbitter C, et al.: Differences across contexts: Minority stress and interpersonal relationships for lesbian, gay, and bisexual women. *Psychol Women Q* 2017;41:8–19.
28. Herek GM, Gillis JR, Cogan JC: Internalized stigma among sexual minority adults: Insights from a social psychology perspective. *J Counsel Psychol* 2009;56:32–43.
29. Berg RC, Munthe-Kaas HM, Ross MW: Internalized homonegativity: A systematic mapping review of empirical research. *J Homosex* 2016;63:541–558.
30. Mak WW, Poon CY, Pun LY, Cheung SF: Meta-analysis of stigma and mental health. *Soc Sci Med* 2007;65:245–261.
31. Schrimshaw EW, Siegel K, Downing MJ, Parsons JT: Disclosure and concealment of sexual orientation and the mental health of non-gay-identified, behaviorally bisexual men. *J Consult Clin Psychol* 2013;81:141–153.
32. Rosser BR, Bockting WO, Ross MW, et al.: The relationship between homosexuality, internalized homo-negativity, and mental health in men who have sex with men. *J Homosex* 2008;55:185–203.
33. Feinstein BA, Goldfried MR, Davila J: The relationship between experiences of discrimination and mental health among lesbians and gay men: An examination of internalized homonegativity and rejection sensitivity as potential mechanisms. *J Consult Clin Psychol* 2012;80:917–927.
34. Pachankis JE, Rendina HJ, Restar A, et al.: A minority stress—emotion regulation model of sexual compulsivity among highly sexually active gay and bisexual men. *Health Psychol* 2015;34:829–840.
35. Branscombe NR, Schmitt MT, Harvey RD: Perceiving pervasive discrimination among African Americans: Implications for group identification and well-being. *J Pers Soc Psychol* 1999;77:135–149.
36. Kertzner RM, Meyer IH, Frost DM, Stirratt MJ: Social and psychological well-being in lesbians, gay men, and bisexuals: The effects of race, gender, age, and sexual identity. *Am J Orthopsychiatry* 2009;79:500–510.
37. Lelutiu-Weinberger C, Pachankis JE, Golub SA, et al.: Age cohort differences in the effects of gay-related stigma, anxiety and identification with the gay community on sexual risk and substance use. *AIDS Behav* 2013;17:340–349.
38. Newcomb ME, Mustanski B: Internalized homophobia and internalizing mental health problems: A meta-analytic review. *Clin Psychol Rev* 2010;30:1019–1029.
39. Szymanski DM, Ikizler AS: Internalized heterosexism as a mediator in the relationship between gender role conflict, heterosexist discrimination, and depression among sexual minority men. *Psychol Men Mascul* 2013;14:211–219.
40. Ramirez-Valles J, Dirkes J, Barrett HA: GayBy Boomers' social support: Exploring the connection between health and emotional and instrumental support in older gay men. *J Gerontol Soc Work* 2014;57:218–234.
41. Stachowski C, Stephenson R: Homophobia and communal coping for HIV risk management among gay men in relationships. *Arch Sex Behav* 2015;44:467–474.
42. Rendina HJ, Gamarel KE, Pachankis JE, et al.: Extending the minority stress model to incorporate HIV-positive gay and bisexual men's experiences: A longitudinal examination of mental health and sexual risk behavior. *Ann Behav Med* 2017;51:147–158.
43. Grov C, Cain D, Whitfield TH, et al.: Recruiting a U.S. national sample of HIV-negative gay and bisexual men to complete at-home self-administered HIV/STI testing and surveys: Challenges and opportunities. *Sex Res Social Policy* 2016;13:1–21.
44. Brown G: Urban (homo)sexualities: Ordinary cities and ordinary sexualities. *Geography Compass* 2008;2:1215–1231.
45. D'Augelli AR, Hart MM: Gay women, men, and families in rural settings: Toward the development of helping communities. *Am J Community Psychol* 1987;15:79–93.
46. Bell D, Valentine G: Queer country: Rural lesbian and gay lives. *J Rural Studies* 1995;11:113–122.
47. Williams ML, Bowen AM, Horvath KJ: The social/sexual environment of gay men residing in a rural frontier state: Implications for the development of HIV prevention programs. *J Rural Health* 2005;21:48–55.
48. Farmer GW, Blois JR, Jabson JM, Matthews DD: Gay acres: Sexual orientation differences in health indicators among rural and non-rural individuals. *J Rural Health* 2016;32:321–331.
49. Hubach RD, Dodge B, Schick V, et al.: Experiences of HIV-positive gay, bisexual and other men who have sex with men residing in relatively rural areas. *Cult Health Sex* 2015;17:795–809.
50. Frye V, Nandi V, Egan J, et al.: Sexual orientation- and race-based discrimination and sexual HIV risk behavior among urban MSM. *AIDS Behav* 2015;19:257–269.
51. Lyons A, Hosking W, Rozbroj T: Rural-urban differences in mental health, resilience, stigma, and social support among young Australian gay men. *J Rural Health* 2015;31:89–97.
52. McCall-Hosenfeld JS, Mukherjee S, Lehman EB: The prevalence and correlates of lifetime psychiatric disorders and trauma exposures in urban and rural settings: Results from the national comorbidity survey replication (NCS-R). *PLoS One* 2014;9:e112416.
53. Hart LG, Larson EH, Lishner DM: Rural definitions for health policy and research. *Am J Public Health* 2005;95:1149–1155.
54. Browne K, Lim J, Brown G: *Geographies of Sexualities: Theory, Politics and Practices*. Aldershot, United Kingdom: Ashgate, 2007.
55. Hall SA, Kaufman JS, Ricketts TC: Defining urban and rural areas in U.S. epidemiologic studies. *J Urban Health* 2006;83:162–175.
56. Grov C, Cain D, Rendina HJ, et al.: Characteristics associated with urethral and rectal gonorrhea and chlamydia diagnoses in a US national sample of gay and bisexual men: Results from the One Thousand Strong panel. *Sex Transm Dis* 2016;43:165–171.
57. Solomon SR, Sawilowsky SS: Impact of rank-based normalizing transformations on the accuracy of test scores. *J Modern Appl Stat Methods* 2009;8:448–462.
58. Herek GM, Chopp R, Strohl D: Sexual stigma: Putting sexual minority health issues in context. In: *The Health of Sexual Minorities, Public Health Perspectives on Lesbian, Gay, Bisexual, and Transgender Populations*. Edited by Meyer IH, Northridge ME. New York: Springer, 2007, pp 171–208.
59. Zimet GD, Dahlem NW, Zimet SG, Farley GK: The Multidimensional Scale of Perceived Social Support. *J Pers Assess* 1988;52:30–41.

60. Radloff LS: The CES-D scale: A self-report depression scale for research in the general population. *Appl Psychol Meas* 1977;1:385–401.
61. Parsons JT, Grov C, Golub SA: Sexual compulsivity, co-occurring psychosocial health problems, and HIV risk among gay and bisexual men: Further evidence of a syndemic. *Am J Public Health* 2012;102:156–162.
62. Stall R, Mills TC, Williamson J, et al.: Association of co-occurring psychosocial health problems and increased vulnerability to HIV/AIDS among urban men who have sex with men. *Am J Public Health* 2003;93:939–942.
63. Starks TJ, Millar BM, Eggleston JJ, Parsons JT: Syndemic factors associated with HIV risk for gay and bisexual men: Comparing latent class and latent factor modeling. *AIDS Behav* 2014;18:2075–2079.
64. Muthén LK, Muthén BO: *Mplus User's Guide*, 6th ed. Los Angeles, CA: Muthén and Muthén, 1998–2010.
65. Eldridge VL, Mack L, Swank E: Explaining comfort with homosexuality in rural America. *J Homosex* 2006;51:39–56.
66. Lewis MN: Rupture, resilience, and risk: Relationships between mental health and migration among gay-identified men in North America. *Health Place* 2014;27:212–219.
67. Lynch FR: Non-ghetto gays: A sociological study of suburban homosexuals. *J Homosex* 1987;13:13–42.
68. Kirkey K, Forsyth A: Men in the valley: Gay male life on the suburban-rural fringe. *J Rural Studies* 2001;17:421–441.
69. Poon CS, Saewyc EM: Out yonder: Sexual-minority adolescents in rural communities in British Columbia. *Am J Public Health* 2009;99:118–124.
70. Wienke C, Hill GJ: Does place of residence matter? Rural-urban differences and the wellbeing of gay men and lesbians. *J Homosex* 2013;60:1256–1279.
71. Rosenberger JG, Schick V, Schnarrs P, et al.: Sexual behaviors, sexual health practices, and community engagement among gay and bisexually identified men living in rural areas of the United States. *J Homosex* 2014;61:1192–1207.
72. Grov C, Breslow AS, Newcomb ME, et al.: Gay and bisexual men's use of the Internet: Research from the 1990s through 2013. *J Sex Res* 2014;51:390–409.
73. Preston DB, D'Augelli AR, Cain RE, Schulze FW: Issues in the development of HIV-preventive interventions for men who have sex with men (MSM) in rural areas. *J Primary Prev* 2002;23:199–214.
74. Boso LA: Urban bias, rural sexual minorities, and the courts. *UCLA Law Rev* 2013;60:562–637.

Address correspondence to:

Jeffrey T. Parsons, PhD

Department of Psychology

Hunter College of the City University of New York

695 Park Avenue

New York, NY 10065

E-mail: jeffrey.parsons@hunter.cuny.edu