Health disparities among lesbian, gay, and bisexual people in the Canadian Longitudinal Study on Aging (CLSA)

Methodological considerations for CLSA data users

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CLSA Webinar Series

Land acknowledgement

- Live and work on the traditional and treaty lands of the Mississaugas of the Credit
- The Humber River watershed
- Place of connection for Anishinaabe, Haudenosaunee, and Wendat peoples

When We Are Kind
MONIQUE GRAY SMITH
ILLUSTRATED BY
NICOLE NEIDHARDT

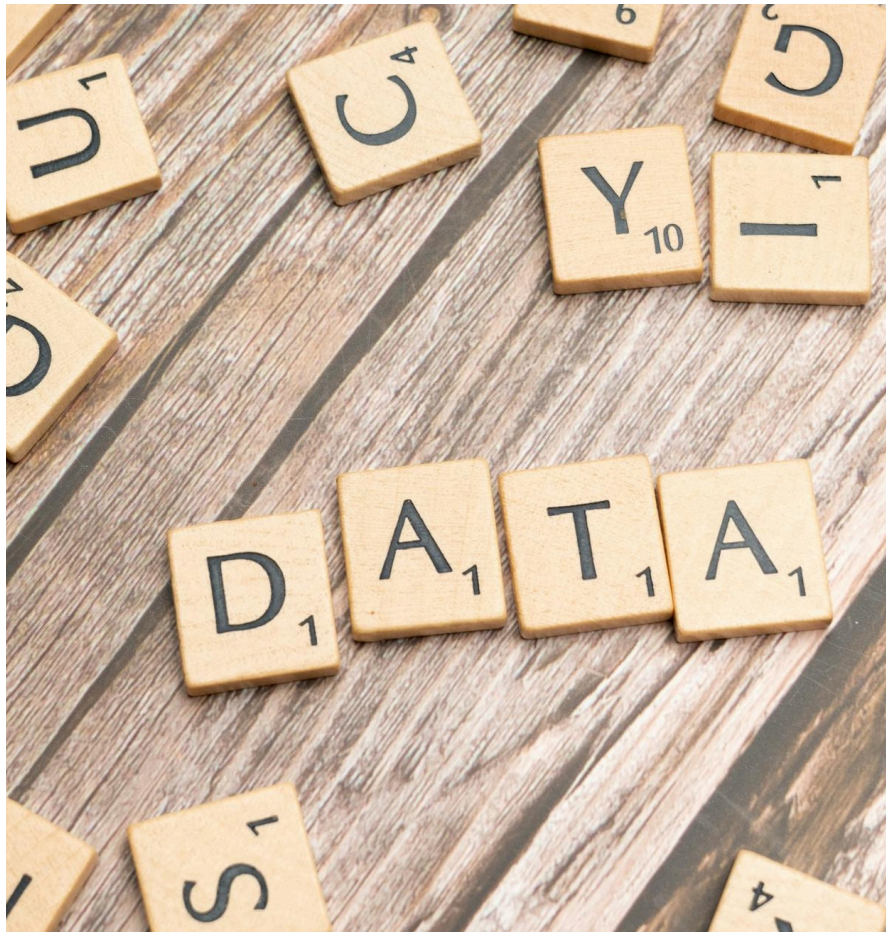
THE GIRL AND THE WOLF
WORDS BY Katherena Vermette
PICTURES Julie Flett

Agenda

1. My experience with the CLSA
2. Delve into the focal paper
3. Explore methodological considerations for CLSA data users
4. Wrap-up

My CLSA Journey

Working with the CLSA



- **From the perspective of a data analyst**
  - CLSA offers a wealth of information
  - Analytic considerations that data users may wish to be aware of

Canadian Journal of Public Health
https://doi.org/10.17269/s41997-025-01130-5

ORIGINAL ARTICLE

Health disparities among lesbian, gay, and bisexual people in the Canadian Longitudinal Study on Aging: A 6-year follow-up

Nicole G. Hammond[1] · Alexandra Grady[2] · Arne Stinchcombe[2,3]

Received: 4 June 2025 / Accepted: 8 October 2025
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Abstract

Objectives Cross-sectionally measured health disparities are well documented among sexual minority (lesbian, gay, bisexual) Canadian adults, yet the timing of these disparities is not understood, especially in harder-to-reach older adult populations. We estimated the prevalence and incidence of health and health-related outcomes over 6 years of follow-up in an older sample of Canadian adults.

Methods Our analysis used data from the Canadian Longitudinal Study on Aging (CLSA), a prospective cohort of adults aged 45–85 (baseline, 2011–2015), with follow-up over 6 years (2015–2021; $n = 45{,}079$). Respondents who self-identified as lesbian, gay, bisexual, or another sexual minority identity at either baseline or first follow-up were considered LGB+. Study outcomes included physical health, mental health, health care service use, negative health behaviours, and other health-related behaviours (e.g., rentership). We computed adjusted prevalence ratios (PRs) and relative risks (RRs) stratified by sex (female/male) using modified Poisson regression with robust error variance.

Findings Older sexual minority adults had a greater prevalence of and were at elevated risk of new-onset mental health diagnoses (e.g., depression: $RR_F = 2.03$, 95% CI: 1.39, 2.96; $RR_M = 2.15$, 95% CI: 1.50, 3.08). Older sexual minority adults also initiated psychological services more than older heterosexual adults (e.g., $RR_F = 1.43$, 95% CI: 1.10, 1.85; $RR_M = 1.39$, 95% CI: 1.05, 1.83). There was evidence of other prevalence differences between men and women, but with no difference in longitudinal risk (e.g., memory problems: $PR_F = 1.78$, 95% CI: 1.24, 2.55; $RR_F = 1.70$, 95% CI: 0.97, 2.95).

Conclusion Older sexual minority Canadians face disproportionate health challenges, particularly in mental health. Our findings demonstrate the importance of inclusive and affirming gerontological care in supporting the healthy aging of sexual minority Canadians.

Résumé

Objectifs Les disparités en matière de santé mesurées de manière transversale sont bien documentées chez les adultes canadiens appartenant à des minorités sexuelles (lesbiennes, gais, bisexuels), mais le moment où ces disparités se manifestent n'est pas bien compris, en particulier chez les populations âgées plus difficiles à atteindre. Nous avons estimé la prévalence et l'incidence des résultats en matière de santé et liés à la santé sur une période de suivi de six ans auprès d'un échantillon d'adultes canadiens d'âge mûr.

Méthodologie Notre analyse a utilisé les données de l'Étude longitudinale canadienne sur le vieillissement (ÉLCV), une cohorte prospective d'adultes de 45 à 85 ans (référence : 2011-2015), avec une période de suivi de six ans (2015-2021; n = 45 079). Ont été considérés comme faisant partie de la communauté LGB+ les répondants qui se sont identifiés comme lesbiennes, gais, bisexuels ou appartenant à une autre minorité sexuelle au moment de l'établissement de la base de référence

Health disparities among LGB+ adults in the CLSA

Focal paper

Health inequality

- Well-established health disparities among sexual minority people
- Demonstrated extensively in cross-sectional work
- Small body of longitudinal research on *aging* sexual minority adults
- Existing work has primarily focused on mental health trajectories

Health inequality

- **Several theoretical frameworks guided our understanding of how minority stress is a determinant of health**
  - Minority Stress Theory (Meyer, 2003; Meyer, 2007; Frost & Meyer, 2023)
  - Minority Stress Framework (Forrester et al., 2019)
  - Structural Stigma (Hatzenbuehler & Link, 2014; Hatzenbuehler et al., 2024)
- **Members of minority communities more likely to experience**
  - Stigma
  - Discrimination
  - Other minority stressors
- **Experiences accumulate over time to influence health trajectories and inequities**

Objective

- **Using a large, national sample of adults in mid-life to older adulthood (45 years+) at baseline**
- **To understand the timing of health disparities among lesbian, gay, bisexual and other sexual minority identifying adults (LGB+)**
  - Persist across mid-life and older adulthood
  - Risk of new onset disparities elevated

Importance

- **A hard-to-reach population** (Flatt et al., 2022)
- **Population-based aging research often excludes sexual and gender identity measures** (Flatt et al., 2022)
- **Lack of longitudinal evidence** (Flatt et al., 2022)
- **Data often not disaggregated by age groups** (Flatt et al., 2022)
- **Altogether, these challenges contribute to the reduced visibility of SGM older adults in health research and health services planning**

Canadian Journal of Public Health (2018) 109:833–844
https://doi.org/10.17269/s41997-018-0100-3

QUANTITATIVE RESEARCH

Physical and mental health inequalities among aging lesbian, gay, and bisexual Canadians: cross-sectional results from the Canadian Longitudinal Study on Aging (CLSA)

Arne Stinchcombe[1,2] · Kimberley Wilson[3] · Katherine Kortes-Miller[4,5] · Lori Chambers[6] · Bruce Weaver[7]

Received: 30 January 2018 / Accepted: 7 June 2018 / Published online: 12 July 2018
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Abstract

Objective International estimates suggest the presence of health inequalities among older sexual minorities (i.e., individuals who identify as lesbian, gay, or bisexual and are 65 years old or above). In this study, we investigated the presence of health inequalities among aging lesbian and bisexual females, as well as aging gay and bisexual males in Canada.

Methods We used baseline data from the Canadian Longitudinal Study on Aging (CLSA) Tracking and Comprehensive cohorts to cross-sectionally compare self-reported physical and mental health indicators by sex and sexual orientation. Within our analysis sample of 51,208 Canadians 45 years old and over, 2% ($n = 1057$) of respondents identified as lesbian, gay, or bisexual.

Results Compared to heterosexual female peers, lesbian and bisexual females had greater odds of heavy drinking (AOR = 1.8, 95% CI = 1.3–2.4) and being a former smoker (AOR = 1.5, 95% CI = 1.2–1.9). Gay and bisexual males had greater odds of reporting a diagnosis of cancer (AOR = 1.5, 95% CI = 1.0–1.9) and currently smoking (AOR = 1.5, 95% CI = 1.1–2.0), compared to heterosexual males. Female and male sexual minorities had greater odds of reporting mood disorders (including depression) and anxiety disorders relative to heterosexual peers of the same sex.

Conclusion These findings highlight the importance of considering both sex and sexual orientation when developing approaches to support the physical and mental health of a diverse aging population in Canada.

Résumé

Objectifs Les estimations internationales suggèrent la présence d'inégalités de santé parmi les minorités sexuelles plus âgées (c'est-à-dire, les personnes ayant 65 ans ou plus et s'identifiant comme étant lesbiennes, gays ou bisexuelles). Dans cette étude, nous avons enquêté la présence d'inégalités en matière de santé chez les femmes lesbiennes et bisexuelles vieillissantes, ainsi que chez les hommes gais et bisexuels vieillissants, au Canada.

Méthode Nous avons utilisé des données de base provenant des cohortes de suivi et des cohortes compréhensives de l'Étude longitudinale canadienne sur le vieillissement (ÉLCV) pour comparer de façon transversale les indicateurs de santé physique et mentale autodéclarés selon le sexe et l'orientation sexuelle. Dans notre échantillon d'analyse de 51 208 Canadiens âgés de 45 ans et plus, 2 % ($n = 1057$) des répondants ont déclaré être lesbiennes, gays ou bisexuels.

Résultats Comparativement aux femmes hétérosexuelles, les femmes lesbiennes et bisexuelles étaient plus probables de consommer l'alcool de manière excessive (AOR = 1,8, IC 95% = 1,3–2,4) et d'être d'anciennes fumeuses (AOR = 1,5, IC 95% = 1,2–1,9). Les hommes gais et bisexuels avaient plus de chances de déclarer un diagnostic de cancer (AOR = 1,5, IC 95% = 1,0–1,9) et d'être fumeurs actuels (AOR = 1,5, IC 95% = 1,1–2,0), comparativement aux hommes hétérosexuels. Les

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Methods Our analysis used data from the Canadian Longitudinal Study on Aging (CLSA), a prospective cohort of adults aged 45–85 (baseline, 2011–2015), with follow-up over 6 years (2015–2021; $n = 45{,}079$). Respondents who self-identified as lesbian, gay, bisexual, or another sexual minority identity at either baseline or first follow-up were considered LGB+. Study outcomes included physical health, mental health, health care service use, negative health behaviours, and other health-related behaviours (e.g., rentership). We computed adjusted prevalence ratios (PRs) and relative risks (RRs) stratified by sex (female/male) using modified Poisson regression with robust error variance.

Findings Older sexual minority adults had a greater prevalence of and were at elevated risk of new-onset mental health diagnoses (e.g., depression: $RR_F = 2.03$, 95% CI: 1.39, 2.96; $RR_M = 2.15$, 95% CI: 1.50, 3.08). Older sexual minority adults also initiated psychological services more than older heterosexual adults (e.g., $RR_F = 1.43$, 95% CI: 1.10, 1.85; $RR_M = 1.39$, 95% CI: 1.05, 1.83). There was evidence of other prevalence differences between men and women, but with no difference in longitudinal risk (e.g., memory problems: $PR_F = 1.78$, 95% CI: 1.24, 2.55; $RR_F = 1.70$, 95% CI: 0.97, 2.95).

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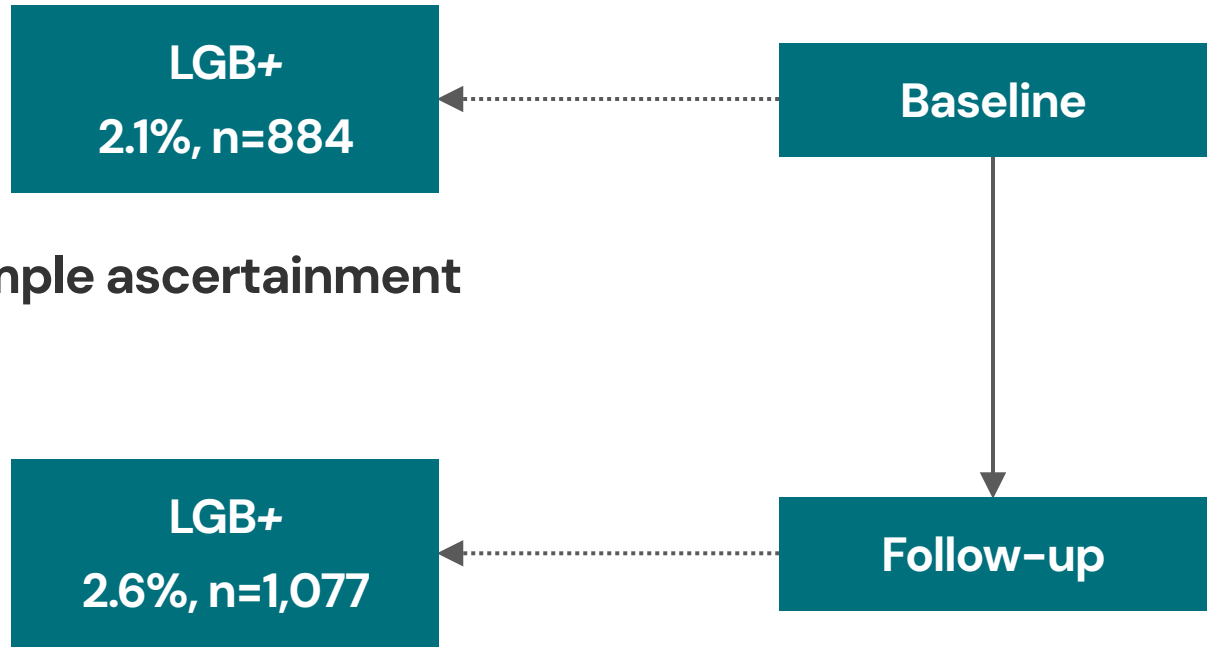
Hypothesis: LGB+ adults will experience greater health disadvantage

Key explanatory variable

- **LGB+**
  - **We recognize that sexual orientation can be fluid and change over time**
  - **Differences in measurement over time**
  - Individuals who endorsed a minority sexual orientation at one time point but not another
  - Includes individuals who reported that they did not identify with any of the sexual orientations listed

Methodological consideration

- Sample ascertainment



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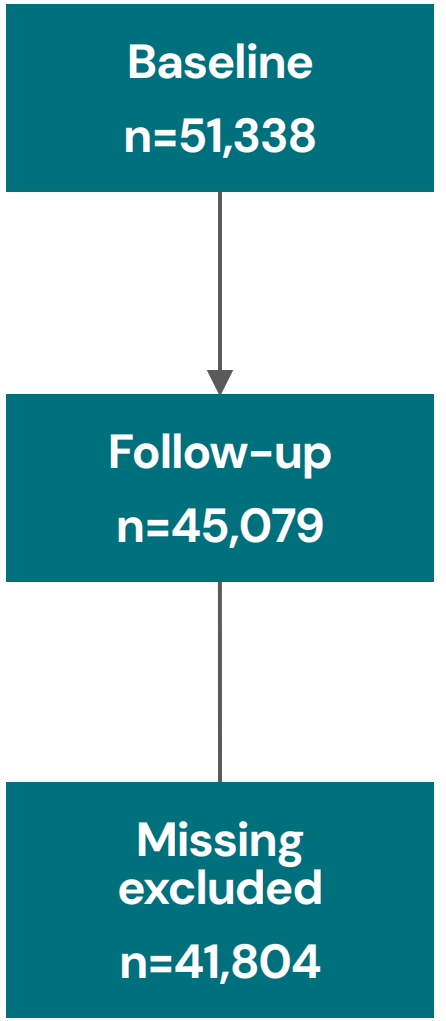


SDC_10
SDC_ORTN_TRM

Do you consider yourself to be: **READ LIST, CODE ONLY ONE RESPONSE.**

Heterosexual? (sexual relations with people of the opposite sex).....1
Homosexual, that is lesbian or gay? (sexual relations with people of your own sex).....2
Bisexual? (sexual relations with people of both sexes).....3
[DO NOT READ] Don't know/No answer.....8
[DO NOT READ] Refused.....9

LGB+
2.1%, n=884

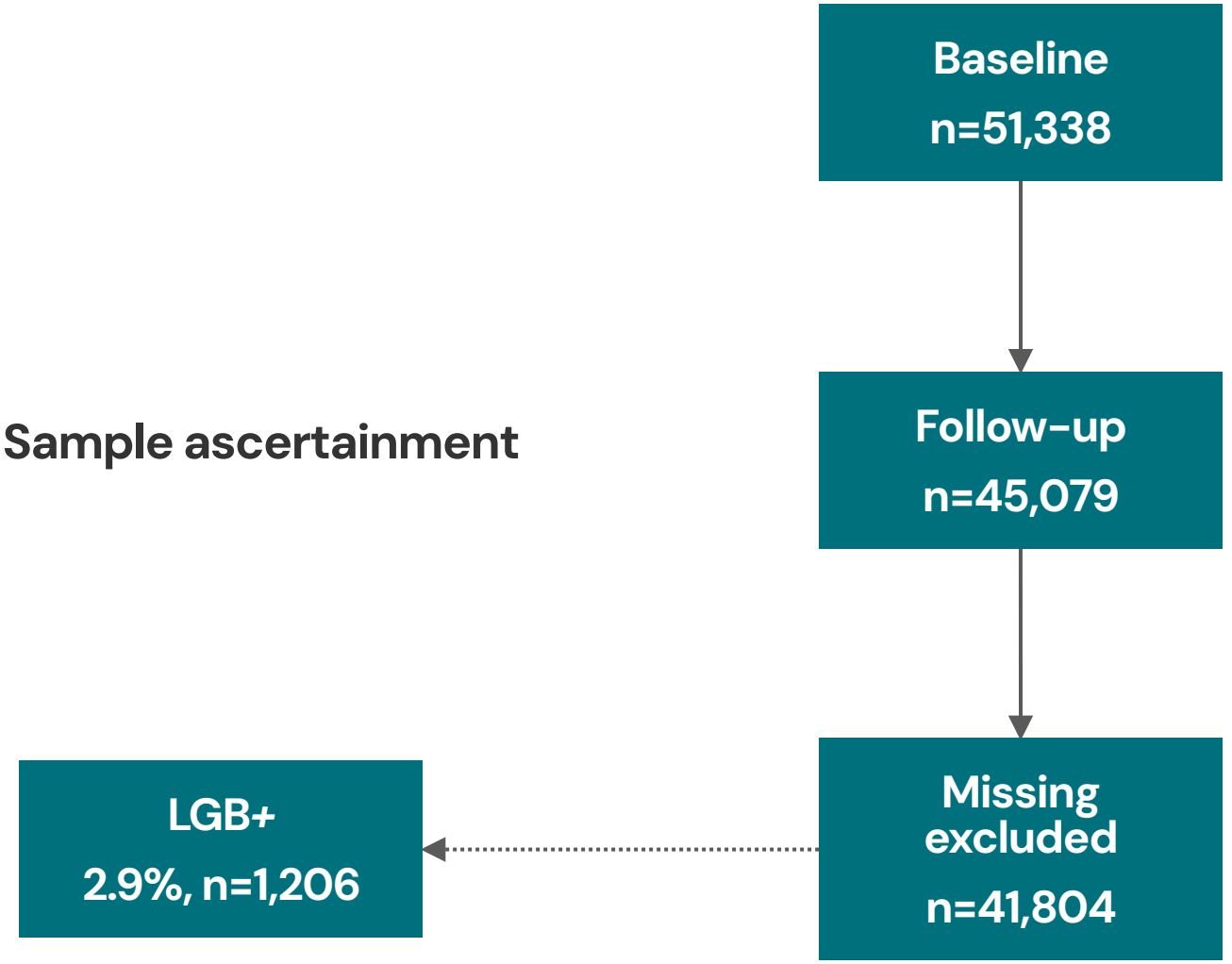
SDC_04	**SDC_ORTN_TRF1**	
[ALWAYS ASK]		
Do you consider yourself to be: Heterosexual? Homosexual? Bisexual?		
BY CORRECTLY ADDRESSING SEX, GENDER IDENTITY AND SEXUAL ORIENTATION WE HAVE AN OPPORTUNITY TO EXAMINE THEIR IMPACT ON AGING AND HEALTH.		
HETEROSEXUAL	01	Heterosexual? (sexual relations with people of the opposite sex)
HOMOSEXUAL	02	Homosexual, that is lesbian or gay? (sexual relations with people of your own sex)
BISEXUAL	03	Bisexual? (sexual relations with people of both sexes)
NOT_ABOVE	04	Does not identify as any of the above responses
DK_NA	08	**[DO NOT READ]** Don't know/No answer
REFUSED	09	**[DO NOT READ]** Refused

LGB+
2.6%, n=1,077

How we ask about sexual orientation matters

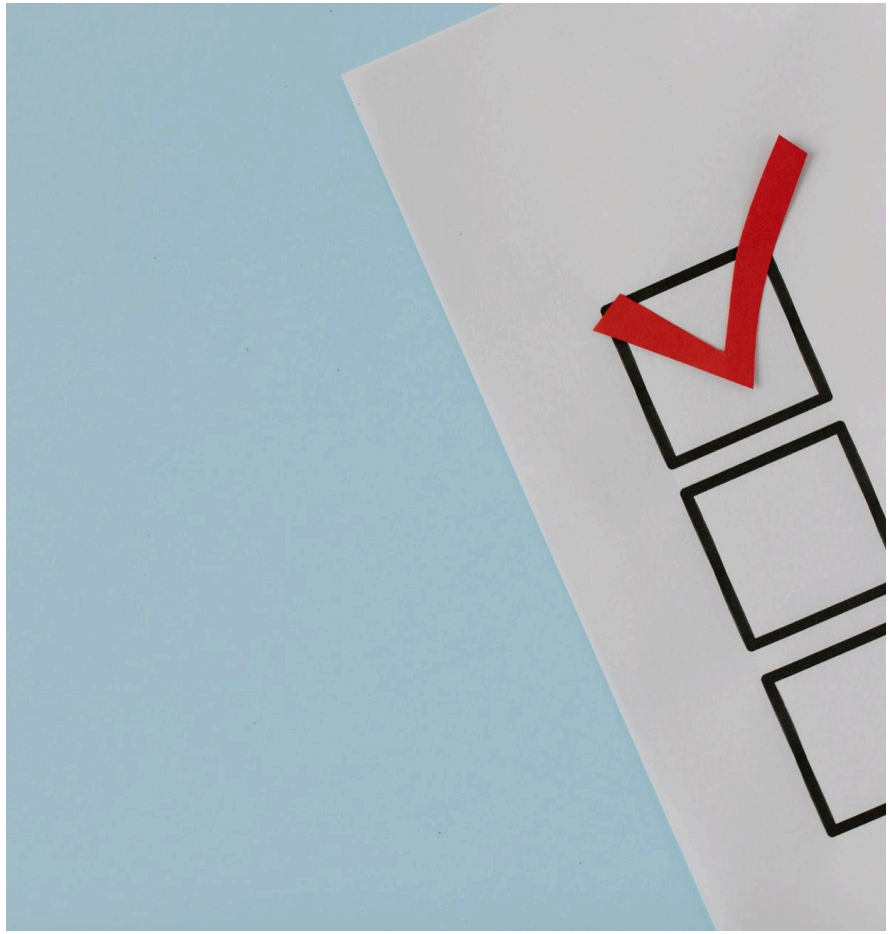
Methodological consideration

- Sample ascertainment



Stratification variable

- **Sex**
  - Known differences in health outcomes
  - Stratified to account for some of these differences and align with existing work
  - Recognize not a perfect measure



Outcomes

Mental health

1. Mood disorder
2. Depression
3. Anxiety disorder
4. Poor mental health

Physical health

1. Cardiovascular disease
2. Respiratory conditions
3. Neurological disorders
4. Other medical conditions

Behavioural health

1. Cigarette use
2. Alcohol use
3. Exercise
4. Sleep
5. Renting

Health care utilization

1. Family physician
2. Medical specialty
3. Psychologist
4. Physiotherapist
5. Overnight hospitalization

Statistical analyses

- **Confounders**

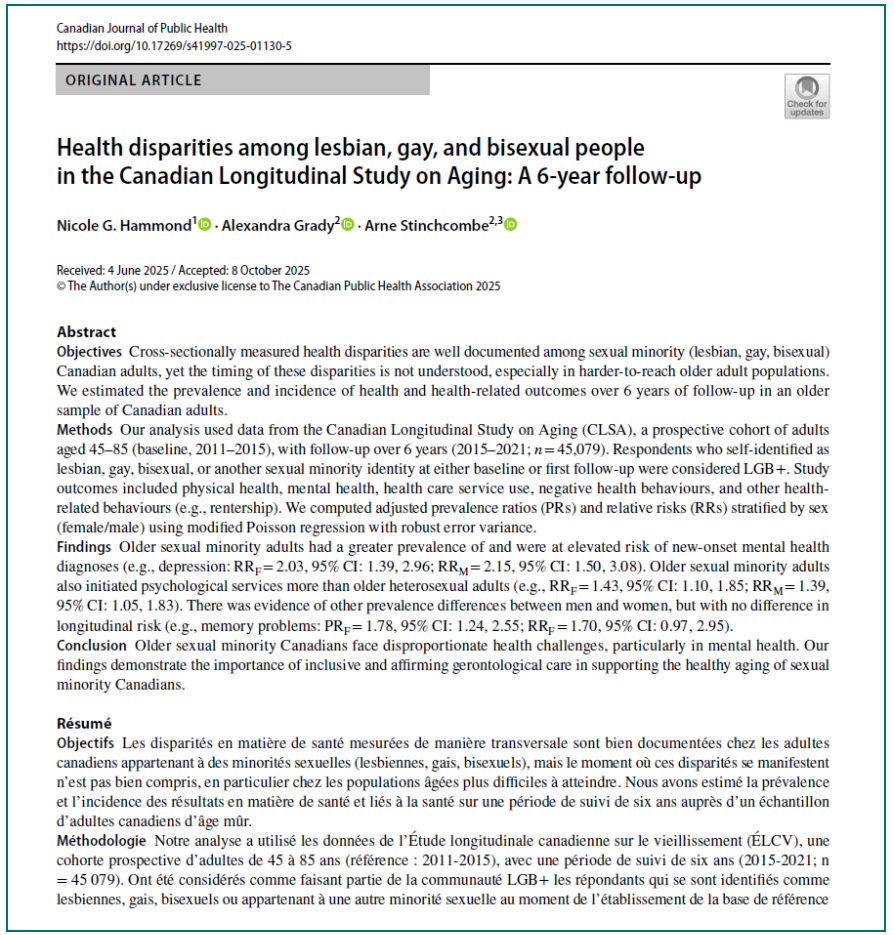
  Baseline age, household income, and educational attainment

- **Modified Poisson regression with robust (sandwich) error variance to obtain**

  Study period prevalence (prevalence ratio)

  Incidence (risk ratio)

- **Data excluded analysis-wise**



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Check for updates

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Outcome ascertainment

Prevalence: reported at any time point

Incidence: free from outcome at baseline and reported over the follow-up period

Results

FUNDAMENTALS

- **LGB+ older adults reported a greater proportion and incidence of most health-related outcomes**
- **Lack of exercise and sleep difficulties were highly prevalent in the full sample**
- **Tables 1 & 2**

Table 3 Chronic health conditions in the Canadian Longitudinal Study on Aging (CLSA) by sex and sexual identity

	Female					Male				
	Heterosexual	Lesbian, bisexual + other identity				Heterosexual	Gay, bisexual + other identity			
	(Ref)	PR	95% CI	RR	95% CI	(Ref)	PR	95% CI	RR	95% CI
Mental health										
Mood disorder	—	**1.31**	**1.18, 1.46**	**1.47**	**1.11, 1.94**	—	**1.54**	**1.37, 1.73**	**1.45**	**1.10, 1.90**
Depression	—	**1.42**	**1.24, 1.62**	**2.03**	**1.39, 2.96**	—	**1.69**	**1.45, 1.97**	**2.15**	**1.50, 3.08**
Anxiety disorder	—	**1.41**	**1.21, 1.64**	**1.56**	**1.18, 2.07**	—	**1.58**	**1.34, 1.87**	**1.87**	**1.43, 2.45**
Poor mental health	—	**1.26**	**1.05, 1.52**	1.25	0.97, 1.61	—	**1.40**	**1.21, 1.63**	**1.57**	**1.28, 1.92**
Cardiovascular disease										
Myocardial infarction	—	1.11	0.73, 1.68	0.73	0.33, 1.63	—	0.97	0.78, 1.19	0.89	0.60, 1.34
Angina	—	**1.56**	**1.14, 2.13**	**1.74**	**1.04, 2.90**	—	1.05	0.84, 1.32	1.10	0.76, 1.59
Hypertension	—	1.02	0.92, 1.12	**1.28**	**1.02, 1.60**	—	1.02	0.95, 1.10	1.04	0.86, 1.26
Stroke or CVA	—	1.48	0.94, 2.33	1.22	0.62, 2.42	—	**1.49**	**1.09, 2.05**	**1.59**	**1.02, 2.47**
Respiratory conditions										
Other respiratory problems	—	**1.44**	**1.18, 1.75**	**1.49**	**1.08, 2.07**	—	**1.25**	**1.02, 1.52**	1.27	0.94, 1.72
Asthma	—	**1.27**	**1.09, 1.49**	1.07	0.70, 1.65	—	**1.25**	**1.07, 1.49**	1.42	1.00, 2.02
Other medical conditions										
Cancer	—	1.01	0.86, 1.19	1.10	0.82, 1.48	—	**1.14**	**1.01, 1.30**	1.19	0.95, 1.48
Pain	—	**1.08**	**1.02, 1.15**	**1.21**	**1.03, 1.40**	—	1.03	0.97, 1.10	1.04	0.91, 1.20
Arthritis	—	1.13	0.84, 1.51	1.36	0.88, 2.12	—	0.79	0.57, 1.09	0.75	0.46, 1.20
Osteoporosis	—	0.98	0.84, 1.14	0.98	0.75, 1.28	—	**1.41**	**1.08, 1.84**	1.17	0.76, 1.79
Diabetes	—	1.13	0.93, 1.36	1.14	0.78, 1.67	—	1.02	0.88, 1.18	1.26	0.97, 1.64
Neurological disorders										
Migraine headaches	—	0.91	0.78, 1.06	0.84	0.58, 1.23	—	**1.24**	**1.02, 1.49**	1.37	0.96, 1.93
Memory problems	—	**1.78**	**1.24, 2.55**	1.70	0.97, 2.95	—	1.10	0.79, 1.55	1.05	0.63, 1.76

Table 4 Health-related behaviours, housing, and health care utilization in the Canadian Longitudinal Study on Aging (CLSA) by sex and sexual identity

	Female					Male				
	Heterosexual	Lesbian, bisexual + other identity				Heterosexual	Gay, bisexual + other identity			
	(Ref)	PR	95% CI	RR	95% CI	(Ref)	PR	95% CI	RR	95% CI
Negative health behaviours										
Cigarette use	—	**1.26**	**1.02, 1.55**	**2.12**	**1.20, 3.76**	—	**1.27**	**1.07, 1.51**	1.43	0.91, 2.27
Excessive drinking	—	1.01	0.87, 1.19	0.70	0.45, 1.09	—	0.95	0.85, 1.06	1.02	0.77, 1.33
No exercise	—	1.01	0.98, 1.03	1.01	0.89, 1.15	—	**0.97**	**0.94, 1.00**	**0.85**	**0.74, 0.98**
Sleep difficulties		1.02	0.99, 1.04	1.08	0.98, 1.18		1.02	0.99, 1.05	1.08	0.99, 1.19
Housing										
Renting	—	**1.33**	**1.19, 1.50**	1.14	0.83, 1.56	—	**1.55**	**1.40, 1.72**	**1.36**	**1.03, 1.78**
Health care utilization										
Family physician	—	1.00	0.99, 1.01	1.01	0.90, 1.14	—	**1.01**	**1.00, 1.02**	1.05	0.96, 1.14
Medical specialty	—	0.98	0.94, 1.02	0.99	0.91, 1.07	—	**1.05**	**1.02, 1.08**	1.06	0.99, 1.14
Psychologist	—	**1.42**	**1.19, 1.70**	**1.43**	**1.10, 1.85**	—	**1.66**	**1.40, 1.98**	**1.39**	**1.05, 1.83**
Physiotherapist	—	1.04	0.98, 1.11	1.01	0.87, 1.16	—	1.00	0.93, 1.07	0.95	0.83, 1.09
Overnight hospitalization	—	1.06	0.91, 1.25	1.16	0.93, 1.43	—	1.08	0.95, 1.23	0.96	0.80, 1.16

Table 4 Health-related behaviours, housing, and health care utilization in the Canadian Longitudinal Study on Aging (CLSA) by sex and sexual identity

	Female					Male				
	Heterosexual	Lesbian, bisexual + other identity				Heterosexual	Gay, bisexual + other identity			
	(Ref)	PR	95% CI	RR	95% CI	(Ref)	PR	95% CI	RR	95% CI
Negative health behaviours										
Cigarette use	—	**1.26**	**1.02, 1.55**	**2.12**	**1.20, 3.76**	—	**1.27**	**1.07, 1.51**	1.43	0.91, 2.27
Excessive drinking	—	1.01	0.87, 1.19	0.70	0.45, 1.09	—	0.95	0.85, 1.06	1.02	0.77, 1.33
No exercise	—	1.01	0.98, 1.03	1.01	0.89, 1.15	—	**0.97**	**0.94, 1.00**	**0.85**	**0.74, 0.98**
Sleep difficulties		1.02	0.99, 1.04	1.08	0.98, 1.18		1.02	0.99, 1.05	1.08	0.99, 1.19
Housing										
Renting	—	**1.33**	**1.19, 1.50**	1.14	0.83, 1.56	—	**1.55**	**1.40, 1.72**	**1.36**	**1.03, 1.78**
Health care utilization										
Family physician	—	1.00	0.99, 1.01	1.01	0.90, 1.14	—	**1.01**	**1.00, 1.02**	1.05	0.96, 1.14
Medical specialty	—	0.98	0.94, 1.02	0.99	0.91, 1.07	—	**1.05**	**1.02, 1.08**	1.06	0.99, 1.14
Psychologist	—	**1.42**	**1.19, 1.70**	**1.43**	**1.10, 1.85**	—	**1.66**	**1.40, 1.98**	**1.39**	**1.05, 1.83**
Physiotherapist	—	1.04	0.98, 1.11	1.01	0.87, 1.16	—	1.00	0.93, 1.07	0.95	0.83, 1.09
Overnight hospitalization	—	1.06	0.91, 1.25	1.16	0.93, 1.43	—	1.08	0.95, 1.23	0.96	0.80, 1.16

Renting may affect study participation

Key summary

- First national longitudinal study of older Canadian to offer a comprehensive examination of health outcomes of older LGB+ people
- LGB+ participants demonstrate several differences in chronic health, health-related behaviours, and health care utilization as they age
- Lack of new-onset risk for certain chronic conditions, suggesting that many health inequalities may be apparent early
- Notable exception: mental health concerns

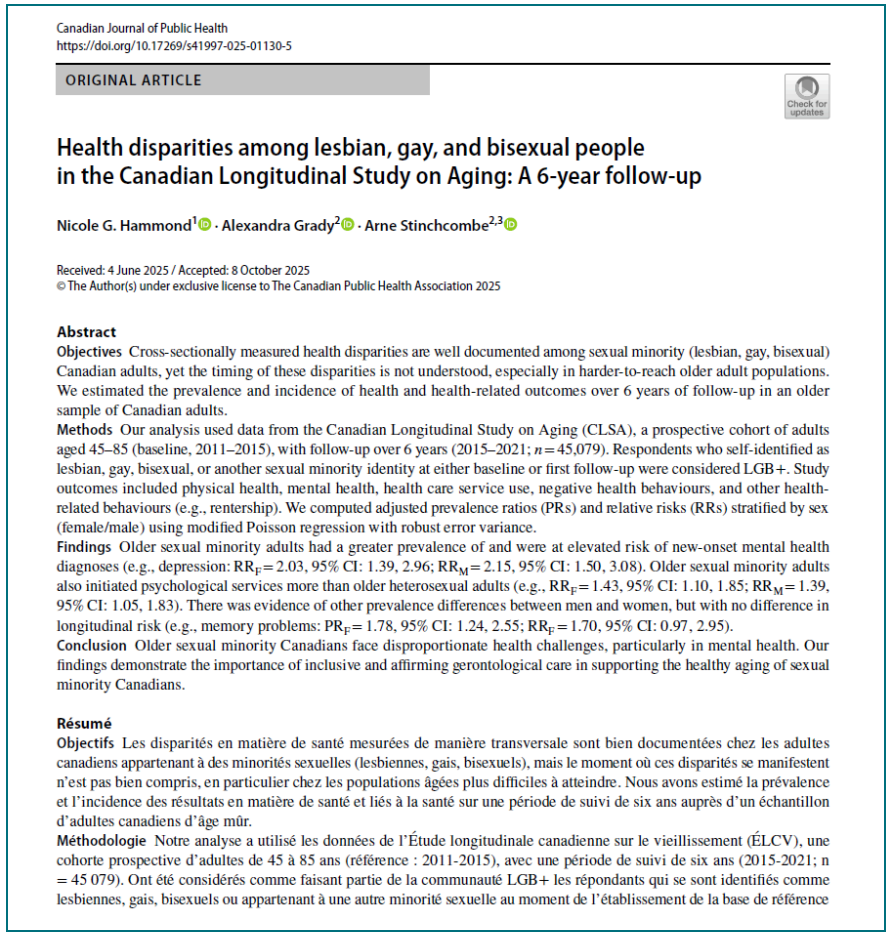
Limitations

- **Survivor bias**
  - Participants lost to follow-up were excluded
  - LGB people have premature mortality (example: McKetta et al., 2020)
    - Leading causes of death: cancer, respiratory disease, suicide, and cardiovascular disease (McKetta et al., 2020)

Limitations

- **Longitudinal survey retention is socially patterned**
  - White
  - Higher socioeconomic status
  - Better health/less stress
  - Example: Midlife in the United States, national US sample (Radler & Ryff, 2010)

Who is missing?



Canadian Journal of Public Health
https://doi.org/10.17269/s41997-025-01130-5

ORIGINAL ARTICLE

Health disparities among lesbian, gay, and bisexual people in the Canadian Longitudinal Study on Aging: A 6-year follow-up

Nicole G. Hammond[1] · Alexandra Grady[2] · Arne Stinchcombe[2,3]

Received: 4 June 2025 / Accepted: 8 October 2025
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Abstract

Objectives Cross-sectionally measured health disparities are well documented among sexual minority (lesbian, gay, bisexual) Canadian adults, yet the timing of these disparities is not understood, especially in harder-to-reach older adult populations. We estimated the prevalence and incidence of health and health-related outcomes over 6 years of follow-up in an older sample of Canadian adults.

Methods Our analysis used data from the Canadian Longitudinal Study on Aging (CLSA), a prospective cohort of adults aged 45–85 (baseline, 2011–2015), with follow-up over 6 years (2015–2021; $n = 45{,}079$). Respondents who self-identified as lesbian, gay, bisexual, or another sexual minority identity at either baseline or first follow-up were considered LGB+. Study outcomes included physical health, mental health, health care service use, negative health behaviours, and other health-related behaviours (e.g., rentership). We computed adjusted prevalence ratios (PRs) and relative risks (RRs) stratified by sex (female/male) using modified Poisson regression with robust error variance.

Findings Older sexual minority adults had a greater prevalence of and were at elevated risk of new-onset mental health diagnoses (e.g., depression: $RR_F = 2.03$, 95% CI: 1.39, 2.96; $RR_M = 2.15$, 95% CI: 1.50, 3.08). Older sexual minority adults also initiated psychological services more than older heterosexual adults (e.g., $RR_F = 1.43$, 95% CI: 1.10, 1.85; $RR_M = 1.39$, 95% CI: 1.05, 1.83). There was evidence of other prevalence differences between men and women, but with no difference in longitudinal risk (e.g., memory problems: $PR_F = 1.78$, 95% CI: 1.24, 2.55; $RR_F = 1.70$, 95% CI: 0.97, 2.95).

Conclusion Older sexual minority Canadians face disproportionate health challenges, particularly in mental health. Our findings demonstrate the importance of inclusive and affirming gerontological care in supporting the healthy aging of sexual minority Canadians.

Résumé

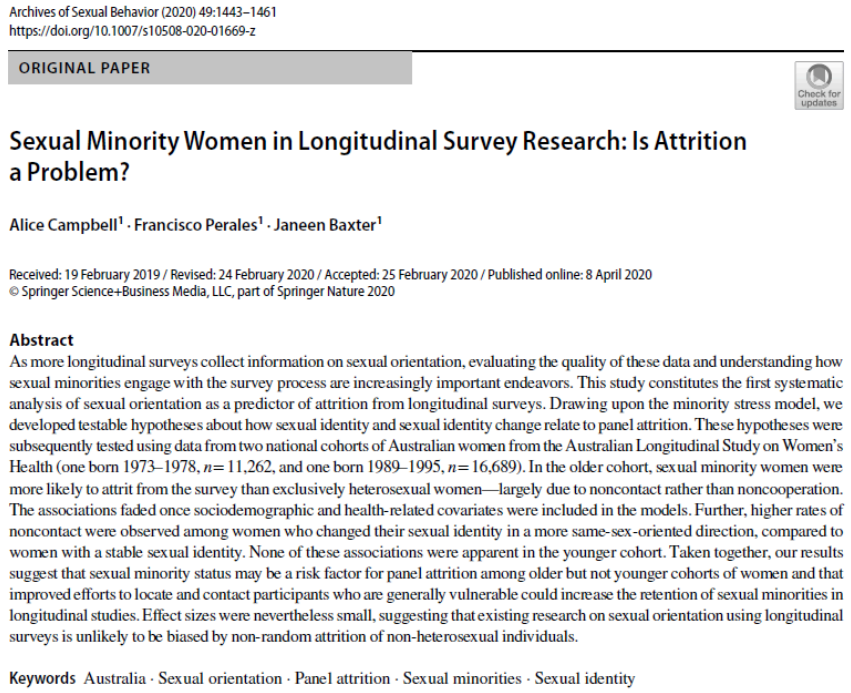
Objectifs Les disparités en matière de santé mesurées de manière transversale sont bien documentées chez les adultes canadiens appartenant à des minorités sexuelles (lesbiennes, gais, bisexuels), mais le moment où ces disparités se manifestent n'est pas bien compris, en particulier chez les populations âgées plus difficiles à atteindre. Nous avons estimé la prévalence et l'incidence des résultats en matière de santé et liés à la santé sur une période de suivi de six ans auprès d'un échantillon d'adultes canadiens d'âge mûr.

Méthodologie Notre analyse a utilisé les données de l'Étude longitudinale canadienne sur le vieillissement (ÉLCV), une cohorte prospective d'adultes de 45 à 85 ans (référence : 2011-2015), avec une période de suivi de six ans (2015-2021; n = 45 079). Ont été considérés comme faisant partie de la communauté LGB+ les répondants qui se sont identifiés comme lesbiennes, gais, bisexuels ou appartenant à une autre minorité sexuelle au moment de l'établissement de la base de référence

- **Respondents lost to follow-up were**
  - More likely to be older at baseline
  - Males
  - To identify as LGB+ or **not respond to the sexual orientation question at baseline (29.2%)**
  - Distinguishing between survey refusals versus **Q**uestioning, for example
- **Other reasons some people may not wish to reveal their sexual orientation**
  - Baseline data collection sandwiched by Supreme Court decisions

Who is missing?

- **Aligns with other population-based survey research** (Campbell et al., 2020)
  - Older women living in Australia who identify as a sexual minority or who do not want to answer are more likely to exit the Australian Longitudinal Study on Women's Health



Archives of Sexual Behavior (2020) 49:1443–1461
https://doi.org/10.1007/s10508-020-01669-z

ORIGINAL PAPER

Sexual Minority Women in Longitudinal Survey Research: Is Attrition a Problem?

Alice Campbell[1] · Francisco Perales[1] · Janeen Baxter[1]

Received: 19 February 2019 / Revised: 24 February 2020 / Accepted: 25 February 2020 / Published online: 8 April 2020
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Abstract
As more longitudinal surveys collect information on sexual orientation, evaluating the quality of these data and understanding how sexual minorities engage with the survey process are increasingly important endeavors. This study constitutes the first systematic analysis of sexual orientation as a predictor of attrition from longitudinal surveys. Drawing upon the minority stress model, we developed testable hypotheses about how sexual identity and sexual identity change relate to panel attrition. These hypotheses were subsequently tested using data from two national cohorts of Australian women from the Australian Longitudinal Study on Women's Health (one born 1973–1978, $n = 11{,}262$, and one born 1989–1995, $n = 16{,}689$). In the older cohort, sexual minority women were more likely to attrit from the survey than exclusively heterosexual women—largely due to noncontact rather than noncooperation. The associations faded once sociodemographic and health-related covariates were included in the models. Further, higher rates of noncontact were observed among women who changed their sexual identity in a more same-sex-oriented direction, compared to women with a stable sexual identity. None of these associations were apparent in the younger cohort. Taken together, our results suggest that sexual minority status may be a risk factor for panel attrition among older but not younger cohorts of women and that improved efforts to locate and contact participants who are generally vulnerable could increase the retention of sexual minorities in longitudinal studies. Effect sizes were nevertheless small, suggesting that existing research on sexual orientation using longitudinal surveys is unlikely to be biased by non-random attrition of non-heterosexual individuals.

Keywords Australia · Sexual orientation · Panel attrition · Sexual minorities · Sexual identity

Opportunity for future advancement

- In the absence of survey weights that assist in maintaining sample representativeness and account for attrition, one can use propensity scores
- Propensity scores can be used to address selection bias
- That those who remain in the survey over time are systematically different from those who the sample represented at baseline
- Stabilized inverse probability of censoring weight (IPCW)

A Structural Approach to Selection Bias

Miguel A. Hernán, Sonia Hernández-Díaz,† and James M. Robins**

Abstract: The term "selection bias" encompasses various biases in epidemiology. We describe examples of selection bias in case-control studies (eg, inappropriate selection of controls) and cohort studies (eg, informative censoring). We argue that the causal structure underlying the bias in each example is essentially the same: conditioning on a common effect of 2 variables, one of which is either exposure or a cause of exposure and the other is either the outcome or a cause of the outcome. This structure is shared by other biases (eg, adjustment for variables affected by prior exposure). A structural classification of bias distinguishes between biases resulting from conditioning on common effects ("selection bias") and those resulting from the existence of common causes of exposure and outcome ("confounding"). This classification also leads to a unified approach to adjust for selection bias.

(*Epidemiology* 2004;15: 615–625)

Epidemiologists apply the term "selection bias" to many biases, including bias resulting from inappropriate selection of controls in case-control studies, bias resulting from differential loss-to-follow up, incidence–prevalence bias, volunteer bias, healthy-worker bias, and nonresponse bias.

As discussed in numerous textbooks,[1–5] the common consequence of selection bias is that the association between exposure and outcome among those selected for analysis differs from the association among those eligible. In this article, we consider whether all these seemingly heterogeneous types of selection bias share a common underlying causal structure that justifies classifying them together. We use causal diagrams to propose a common structure and show how this structure leads to a unified statistical approach to adjust for selection bias. We also show that causal diagrams can be used to differentiate selection bias from what epidemiologists generally consider confounding.

Submitted 21 March 2003; final version accepted 24 May 2004.
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Miguel Hernán was supported by NIH grant K08-AI-49392 and James Robins by NIH grant R01-AI-32475.
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ISSN: 1044-3983/04/1505-0615
DOI: 10.1097/01.ede.0000135174.63482.43

CAUSAL DIAGRAMS AND ASSOCIATION

Directed acyclic graphs (DAGs) are useful for depicting causal structure in epidemiologic settings.[6–12] In fact, the structure of bias resulting from selection was first described in the DAG literature by Pearl[13] and by Spirtes et al.[14] A DAG is composed of variables (nodes), both measured and unmeasured, and arrows (directed edges). A causal DAG is one in which 1) the arrows can be interpreted as direct causal effects (as defined in Appendix A.1), and 2) all common causes of any pair of variables are included on the graph. Causal DAGs are acyclic because a variable cannot cause itself, either directly or through other variables. The causal DAG in Figure 1 represents the dichotomous variables L (being a smoker), E (carrying matches in the pocket), and D (diagnosis of lung cancer). The lack of an arrow between E and D indicates that carrying matches does not have a causal effect (causative or preventive) on lung cancer, ie, the risk of D would be the same if one intervened to change the value of E.

Besides representing causal relations, causal DAGs also encode the causal determinants of statistical associations. In fact, the theory of causal DAGs specifies that an association between an exposure and an outcome can be produced by the following 3 causal structures[13,14]:

1. Cause and effect: If the exposure E causes the outcome D, or vice versa, then they will in general be associated. Figure 2 represents a randomized trial in which E (antiretroviral treatment) prevents D (AIDS) among HIV-infected subjects. The (associational) risk ratio ARR_{ED} differs from 1.0, and this association is entirely attributable to the causal effect of E on D.
2. Common causes: If the exposure and the outcome share a common cause, then they will in general be associated even if neither is a cause of the other. In Figure 1, the common cause L (smoking) results in E (carrying matches) and D (lung cancer) being associated, ie, again, $ARR_{ED} \neq 1.0$.
3. Common effects: An exposure E and an outcome D that have a common effect C will be conditionally associated if

Article

SMMR STATISTICAL METHODS IN MEDICAL RESEARCH

Statistical Methods in Medical Research
22(3) 278–295
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DOI: 10.1177/0962280210395740
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SAGE

Review of inverse probability weighting for dealing with missing data

Shaun R Seaman and Ian R White

Abstract

The simplest approach to dealing with missing data is to restrict the analysis to complete cases, i.e. individuals with no missing values. This can induce bias, however. Inverse probability weighting (IPW) is a commonly used method to correct this bias. It is also used to adjust for unequal sampling fractions in sample surveys. This article is a review of the use of IPW in epidemiological research. We describe how the bias in the complete-case analysis arises and how IPW can remove it. IPW is compared with multiple imputation (MI) and we explain why, despite MI generally being more efficient, IPW may sometimes be preferred. We discuss the choice of missingness model and methods such as weight truncation, weight stabilisation and augmented IPW. The use of IPW is illustrated on data from the 1958 British Birth Cohort.

Keywords

Asymptotic efficiency, doubly robust, model misspecification, propensity score

1 Introduction

Almost all datasets collected for medical or social research are missing some information that was intended to be collected. This complicates their analysis. A commonly used approach is to exclude individuals with missing data. However, estimates obtained from this 'complete-case' (CC) analysis may be biased if the excluded individuals are systematically different from those included. Inverse probability weighting (IPW) is one of several methods that can reduce this bias. In this method, complete cases are weighted by the inverse of their probability of being a complete case.

Another use of IPW is to correct for unequal sampling fractions. When a survey is conducted, if the sample is representative, i.e. everyone is equally likely to be sampled, few or no individuals with rare characteristics will be chosen. Such individuals may be of particular interest. To ensure that an adequate number of them are sampled, sampling weights are used. Each individual in the population is given a sampling weight and the probability that he or she is chosen is proportional to this weight. Sample estimates of population quantities may now, however, be biased, as the sample is

Metten *et al.*
BMC Medical Research Methodology (2022) 22:45
https://doi.org/10.1186/s12874-022-01533-9

BMC Medical Research Methodology

RESEARCH Open Access

Inverse probability weighting to handle attrition in cohort studies: some guidance and a call for caution

Marie-Astrid Metten[1], Nathalie Costet[2], Luc Multigner[2], Jean-François Viel[1] and Guillaume Chauvet[3*]

Abstract

Background: Attrition in cohort studies challenges causal inference. Although inverse probability weighting (IPW) has been proposed to handle attrition in association analyses, its relevance has been little studied in this context. We aimed to investigate its ability to correct for selection bias in exposure-outcome estimation by addressing an important methodological issue: the specification of the response model.

Methods: A simulation study compared the IPW method with complete-case analysis (CCA) for nine response-mechanism scenarios (3 missing at random – MAR and 6 missing not at random - MNAR). Eighteen response models differing by the type of variables included were assessed.

Results: The IPW method was equivalent to CCA in terms of bias and consistently less efficient in all scenarios, regardless of the response model tested. The most effective response model included only the confounding factors of the association model.

Conclusion: Our study questions the ability of the IPW method to correct for selection bias in situations of attrition leading to missing outcomes. If the method is to be used, we encourage including only the confounding variables of the association of interest in the response model.

Keywords: Cohort studies, Attrition, Missing outcome, Selection bias, Inverse probability weighting, Complete-case analysis

Childhood Adversity And Memory In Mid-to-Late Adulthood: Evidence Of Elevated Risk Among LGB+ Adults In The CLSA:

Author Block: Arne Stinchcombe[1], Nicole G. Hammond[2].

[1]School of Psychology, University of Ottawa, Ottawa, ON, Canada, [2]College of Community and Global Health, University of Manitoba, Winnipeg, MB, Canada.

Abstract:

Background: Adverse childhood experiences (ACEs) are associated with poorer cognitive health later in life, but evidence is limited on whether these relationships differ by sexual identity. Longitudinal studies may underestimate the ACE-cognition association when loss to follow-up is not addressed, particularly in minoritized populations. We examined associations between ACEs and memory in older adulthood and assessed whether these associations differ between lesbian, gay, bisexual, or another sexual minority identity (LGB+) and heterosexual adults.

Methods: We used the Canadian Longitudinal Study of Aging (CLSA), Canada's largest prospective cohort study of adults aged 45 years and older at baseline (2011-2015). Respondents self-reported their sexual identity as LGB+ (n=865), versus heterosexual (referent) (n=32,261). At first follow-up (2015-2018), participants recalled ACEs before age 16 years (e.g., physical abuse, sexual abuse) and age 18 years (e.g., death of a parent, parental separation/divorce). Outcomes were immediate and delayed memory recall, measured using the Rey Auditory Verbal Learning Test, at the second follow-up (2018-2021). To account for loss to follow-up in this large, multi-wave cohort, we computed stabilized inverse probability of censoring weights. We estimated the risk of poor immediate and delayed memory recall using adjusted modified Poisson regression. Results were stratified by sexual identity.

Results: The number of reported ACEs ranged from 0 to 8. There were no relationships between the number of ACEs and immediate or delayed recall for LGB+ or heterosexual respondents when using conventional regression models with no adjustment for censoring. After accounting for censoring, there was good evidence that LGB+ adults who experienced ACEs before age 16 years had a greater risk of below-median delayed memory at last follow-up (1 ACE: RR=1.20, 95%CI:1.05,1.37; ≥2ACEs: RR=1.14, 95%CI:1.00,1.31). The same was true for combined ACEs experienced at age 16 and/or 18 years for LGB+ respondents only: (1 ACE: RR=1.20,95%CI:1.02,1.41; 2 ACEs: RR=1.27,95%CI:1.07,1.49; ≥3ACEs: RR=1.18,95%CI:1.00,1.39). All other relationships were weaker or not statistically significant.

Conclusion: After accounting for attrition, ACEs were associated with poorer delayed memory recall among LGB+ adults but not heterosexual adults. These findings suggest that studies ignoring attrition may underestimate the cognitive consequences of childhood adversity, particularly for sexual minority populations.

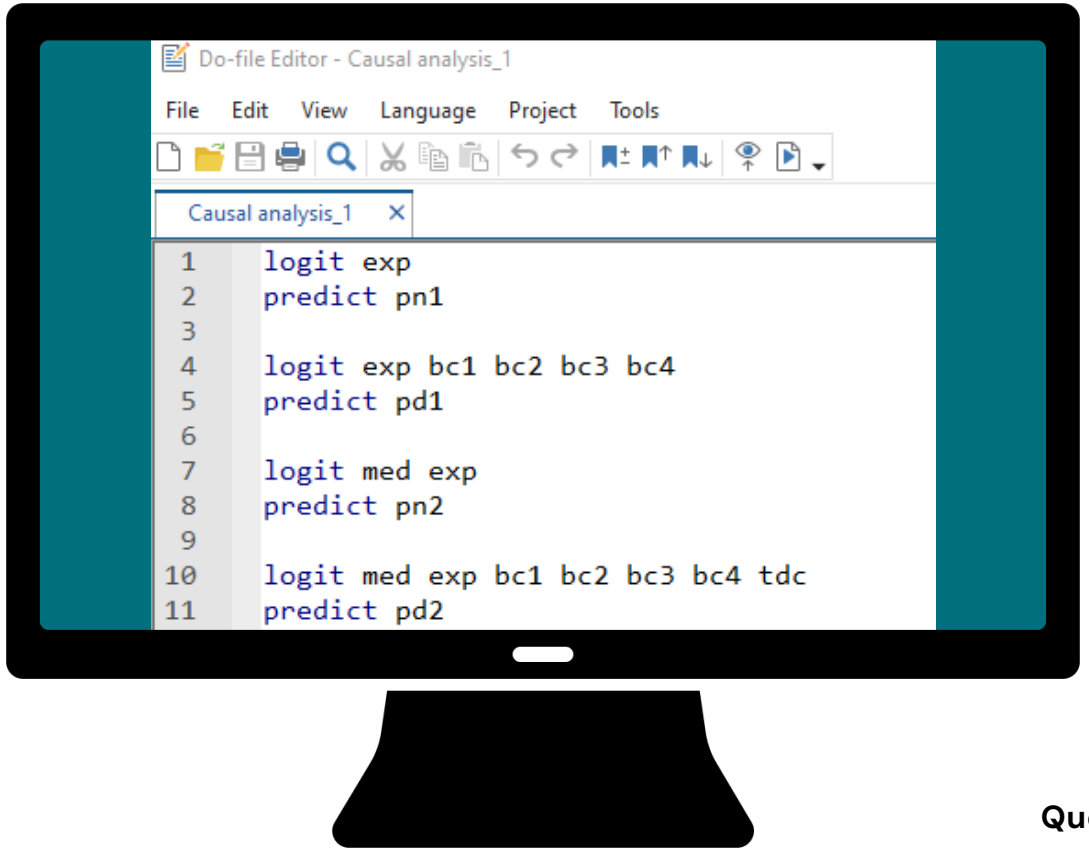
Alzheimer's Association International Conference (AAIC) 2026

Using causal inference methods to address selection bias in the CLSA.

Accounting for potential selection bias

Causally informed approach to estimate the long-term relationship between ACEs (before age 18 years) and memory

Constructing the Stabilized Weights in STATA



Basics

"...building a logistic regression model to estimate the probability of the exposure observed for a particular person, and using the predicted probability as a weight in our subsequent analyses".

Quote source: publichealth.columbia.edu/research/population-health-methods/inverse-probability-weighting

Code source:

VanderWeele TJ. Causal mediation analysis short course [unpublished course materials]. May-June 2021; Online.

Selected results: delayed recall

	Not accounting for attrition	Accounting for attrition
LGB+	**1 ACE: OR=1.17, 95% CI: 1.03, 1.34**	**1 ACE: OR=1.18, 95% CI: 1.03, 1.34**
	2+ ACEs: OR=1.14, 95% CI: 1.00, 1.31	**2 +ACEs: OR=1.15, 95% CI: 1.00, 1.31**
Heterosexual	1 ACE: OR=1.02, 95% CI: 1.00, 1.04	**1 ACE: OR=1.02, 95% CI: 1.00, 1.04**
	2+ ACEs: OR=0.98, 95% CI: 0.96, 1.01	2+ ACEs: OR=0.99, 95% CI: 0.97, 1.01

Other uses

- Also used to balance exposure groups on confounders
- Address time-dependent confounding
- More advanced methods required: fitting marginal structural models using inverse probability weighting

Marginal Structural Models and Causal Inference in Epidemiology

James M. Robins,[1,2] *Miguel Ángel Hernán,*[1] *and Babette Brumback*[2]

In observational studies with exposures or treatments that vary over time, standard approaches for adjustment of confounding are biased when there exist time-dependent confounders that are also affected by previous treatment. This paper introduces marginal structural models, a new class of causal models that allow for improved adjustment of confounding in those situations. The parameters of a marginal structural model can be consistently estimated using a new class of estimators, the inverse-probability-of-treatment weighted estimators. (Epidemiology 2000;11:550–560)

Keywords: causality, counterfactuals, epidemiologic methods, longitudinal data, structural models, confounding, intermediate variables

Marginal structural models (MSMs) are a new class of causal models for the estimation, from observational data, of the causal effect of a time-dependent exposure in the presence of time-dependent covariates that may be simultaneously confounders and intermediate variables.[1–3] The parameters of a MSM can be consistently estimated using a new class of estimators: the inverse-probability-of-treatment weighted (IPTW) estimators. MSMs are an alternative to structural nested models (SNMs), the parameters of which are estimated through the method of g-estimation.[4–6]

The usual approach to the estimation of the effect of a time-varying exposure or treatment has been to model the probability of disease as a function of past exposure and past confounder history, using analytic methods such as stratified analysis and its parametric analogs (for example, logistic or proportional hazards regression). We will show in sections 4 and 7.1 that these standard approaches may be biased, whether or not one further adjusts for past confounder history in the analysis, when (1) there exists a time-dependent covariate that is a risk factor for, or predictor of, the event of interest and also predicts subsequent exposure, and (2) past exposure history predicts subsequent level of the covariate. We refer to covariates satisfying condition 1 as time-dependent confounders. Conditions 1 and 2 will be true in many observational studies, particularly those in which there is confounding by indication. For example, in a study of the effect of zidovudine (AZT) treatment on mortality among human immunodeficiency virus (HIV)-infected subjects, the time-dependent covariate CD4 lymphocyte count is both an independent predictor of survival and initiation of therapy with AZT and is itself influenced by prior AZT treatment. In a study of the effect of obesity on mortality, the development of clinical cardiac or respiratory disease is an independent predictor of both mortality and subsequent weight loss and is influenced by prior weight gain. Conditions 1 and 2 will always hold when there are time-dependent covariates that are simultaneously confounders and intermediate variables. A more detailed description of the bias of standard methods, as well as several additional epidemiologic examples of time-dependent confounding, has been presented elsewhere.[5,7]

1. Time-Dependent Confounding

Consider a follow-up study of HIV-infected patients. Let A_k be the dose of the treatment or exposure of interest, say AZT, on the k^{th} day since start of follow-up. Let Y be a dichotomous outcome of interest (for example, $Y = 1$ if HIV RNA is not detectable in the blood and is 0 otherwise) measured at end of follow-up on day $K + 1$. Our goal is to estimate the causal effect of the time-dependent treatment A_k on the outcome Y.

Figure 1 is a causal graph that represents our study with $K = 1$. A causal graph is a directed acyclic graph in which the vertices (nodes) of the graph represent variables and the directed edges (arrows) represent direct causal effects.[8] In Figure 1, L_k represents the value on day k of the vector of all measured risk factors for the outcome, such as age, CD4 lymphocyte count, white blood count (WBC), hematocrit, diagnosis of acquired immunodeficiency syndrome (AIDS), and the presence or absence of various symptoms or opportunistic infections such as oral candidiasis. Similarly, U_k represents the value on day k of all unmeasured causal risk factors for Y. Figure 1, *b*, differs from

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This research was supported by NIH grant R01-A132475.

Submitted August 4, 1999; final version accepted February 28, 2000.

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Additional opportunities for future advancement

- Intersectionality with other equity dimensions (e.g., race/ethnicity, income)
- Lived and living experience
- Linking with Canadian health administrative data

Key takeaways

- LGB+ Canadians experience a higher proportion of many adverse health outcomes in older adulthood
- Most pronounced is the persistently elevated risk of mental health concerns
- Equitable, health-promoting strategies are needed to increase healthy aging
- Gerontological care should be trauma-informed, inclusive, and affirming of sexual minority identities

Collaborator acknowledgements

- **Dr. Arne Stinchcombe**
  Director of the Healthy Aging Research Program (HARP)
  PHAC/CIHR Research Chair in Applied Public Health (2SLGBTQI+ Health and Aging)

- **Allie Grady, PhD (c)**
  HARP Lab Member

Funding acknowledgements

- **Canadian Institutes of Health Research**

  Frederick Banting and Charles Best Canada Graduate Scholarship Award (2020-2025)

  Canada Postdoctoral Research Award (2026-2028)

- **Canadian Research Data Centre Network (CRDCN)**

  Emerging Scholars Award (2024)

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References*

Flatt JD, Cicero EC, Kittle KR, Brennan-Ing M. Recommendations for Advancing Research With Sexual and Gender Minority Older Adults. *J Gerontol B Psychol Sci Soc Sci*. 2022;77(1):1-9. doi:10.1093/geronb/gbab127

Forrester SN, Gallo JJ, Whitfield KE, Thorpe RJ. A Framework of Minority Stress: From Physiological Manifestations to Cognitive Outcomes. *Gerontologist*. 2019;59(6):1017-1023. doi:10.1093/geront/gny104

Frost DM, Meyer IH. Minority stress theory: Application, critique, and continued relevance. *Curr Opin Psychol*. 2023;51:101579. doi:10.1016/j.copsyc.2023.101579

Hatzenbuehler ML, Lattanner MR, McKetta S, Pachankis JE. Structural stigma and LGBTQ+ health: a narrative review of quantitative studies. *Lancet Public Health*. 2024;9(2):e109-e127. doi:10.1016/S2468-2667(23)00312-2

Hatzenbuehler ML, Link BG. Introduction to the special issue on structural stigma and health. *Soc Sci Med*. 2014;103:1-6. doi:10.1016/j.socscimed.2013.12.017

McKetta S, Hoatson T, Hughes LD, et al. Disparities in Mortality by Sexual Orientation in a Large, Prospective Cohort of Female Nurses. *JAMA*. 2024;331(19):1638-1645. doi:10.1001/jama.2024.4459

Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull*. 2003;129(5):674-697. doi:10.1037/0033-2909.129.5.674

Meyer IH. Prejudice and Discrimination as Social Stressors. In: Meyer IH, Northridge ME, ed. *The Health of Sexual Minorities*. Springer; 2007:242-267.

***The reference list contains cited articles for which abstracts do not appear in the slide deck.**