Manitoba Centre for Health Policy

The National Centre for Truth and Reconciliation Legacy Project

Summary of a Data Linkage Pilot Study

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About the Manitoba Centre for Health Policy

The Manitoba Centre for Health Policy (MCHP) conducts world-class population-based research on health and the social determinants of health. Our mission is to conduct collaborative research and analytics which inform solutions to support a thriving society.

We curate Manitoba's unique data repository and develop trainees in population-based research. Our work is guided by our core values of innovation, reconciliation, excellence, IDEA (Inclusion, Diversity, Equity, and Accessibility), and teamwork and collaboration. MCHP is located within the Rady Faculty of Health Sciences at the University of Manitoba.

We use data held within the Manitoba Population Research Data Repository (Repository) to examine patterns in population-based health and wellbeing and explore relationships with factors such as income, education, employment, and social status. Linkable at the individual level and over time, the Repository holds a comprehensive collection of de-identified administrative, registry, survey, and other data primarily relating to Manitobans across multiple sectors including health, justice, education, social services and more.

New data sets continue to be added to the Repository, and all current data sets are updated on an annual basis. MCHP acts as a steward of the information in the Repository for agencies such as Manitoba Health and provides access to the data to researchers, students and groups outside of MCHP for a wide variety of research and educational purposes.

MCHP conducts two streams of research: contracted “Deliverable” projects for the Manitoba Government and grant-funded research. We produce several research projects every year under contract with Manitoba Health, which contributes to the health policy process. MCHP consults extensively with government officials, healthcare administrators and clinicians to develop a research agenda that is topical and relevant. Our research team also conducts studies funded through research grants. Research topics range across several areas of expertise such as newborn and maternal health, Indigenous health and wellbeing, older adults, family medicine, data quality, child development, mental health and substance use, and more. We collaborate with community partners, stakeholders and scientists worldwide, and our research is published in some of the field’s most preeminent journals.

Acknowledgements

We acknowledge the University of Manitoba Health Research Ethics Board and the Provincial Health Research Privacy Committee for their review of the research project. We thank Manitoba Health, Seniors and Long-Term Care, Advanced Education and Training, Justice, and Shared Health for the use of their data for analyses. We thank the National Truth and Reconciliation Centre staff and research team, as well as the NCTR Survivors Circle for their commitment to this research.

Executive Summary

For generations, Indigenous Peoples have shared knowledge of the lasting impacts of residential schools on Survivors, their families, and their communities. The National Centre for Truth and Reconciliation (NCTR) holds an extensive collection of records documenting residential school experiences. Linking these historical records with health and social data offers an opportunity to better understand how the impacts of residential schools extend across generations.

About the Study: The NCTR partnered with the Manitoba Centre for Health Policy (MCHP) to conduct a pilot study exploring the use of linked data to examine health, education, and justice system outcomes among Residential School Survivors and their Descendants. The study was developed with guidance from the NCTR Survivors Circle.

Thirty-three Survivors and Descendants consented to participate. Their records were linked with data in the Manitoba Population Research Data Repository and compared with those of 495 Manitobans of similar age, sex, and neighbourhood income level.

Key Findings:

Compared with matched controls, Survivors and Descendants were:

- 2.67 times more likely to have diabetes.
- 1.63 times more likely to have ischemic heart disease.
- 1.43 times more likely to have respiratory illness.
- 1.36 times more likely to have hypertension.
- 1.49 times more likely to have experienced a hospital admission.

These differences were statistically significant, meaning they were unlikely to be explained by random variation alone. Differences in mental health outcomes were less conclusive, largely because of the small number of participants.

Limitations: As a pilot study involving only 33 participants, these findings should be interpreted cautiously. Participants may not represent all Survivors and Descendants, and differences in other characteristics could have influenced the results. The study is observational and cannot establish that residential school experiences were the cause of the observed health differences.

Looking Ahead: This pilot study demonstrates the potential of linking historical residential school records with Manitoba's population data. It also identifies important considerations for future research, including the need for larger samples, more complete data, and approaches that recognize the diversity of Survivor and Descendant experiences.

Building on this work in partnership with Indigenous community would strengthen understanding of the intergenerational impacts of residential schools and help inform programs and services that support the health and wellbeing of Indigenous Peoples.

Introduction

The National Centre for Truth and Reconciliation (NCTR) holds an extensive collection of records documenting the experiences of Residential School Survivors, including more than 7,000 Survivor statements, historical documents, and over 40,000 photographs. These records were transferred to the NCTR Archives following the conclusion of the Truth and Reconciliation Commission of Canada's work in 2015. Since then, the NCTR has received many inquiries from Survivors and their Descendants, who are seeking information about their residential school experiences and the lasting impacts on their families' and communities' health and social wellbeing.

The residential school system operated for more than seven generations, with consequences that continue to affect Indigenous families and communities today. The NCTR's archival records offer an important opportunity to better understand these impacts across generations. Linking the NCTR records with administrative health and social data held in the Manitoba Population Research Data Repository at the Manitoba Centre for Health Policy (MCHP) could provide further insight into the relationships between residential school experiences and the health and wellbeing of Survivors, their families, and their Descendants.

To explore this potential, the NCTR and MCHP have undertaken a pilot study examining the feasibility and value of linking residential school records with Manitoba's administrative data. The study will assess the types of analyses these linked data can support and lay the groundwork for a more comprehensive study using multiple research methods. Ultimately, this work aims to contribute evidence that can inform Indigenous-inspired social programs and services supporting the health, education, and wellbeing of Indigenous Peoples.

Research Objective

Conduct a pilot study describing health, education and justice system outcomes among Residential School Survivors and Descendants in Manitoba.

1. Examine potential **health-related outcomes**, such as the prevalence of chronic disease, mental illness, addiction disorders and suicide attempts, and hospitalization.
2. Examine potential **education-related outcomes**, such as high school graduation rates.
3. Examine potential **justice system-related outcomes**, such as rates of being accused of a crime, being a witness to a crime, and being the victim of a crime.

Methods

Indigenous Peoples have long recognized and documented the lasting impacts of residential schools on individuals, families, and communities across generations. These harms have contributed to persistent inequities in health, education, income, and social wellbeing, reinforced by the policies and systems that established and sustained residential schools. Although Indigenous communities have shared extensive knowledge of these experiences and their consequences, quantitative research examining the extent and patterns of intergenerational impacts remains limited. As Bombay and colleagues (2014) observed, “despite the scholarly interest in historical trauma as an explanation for current group-based health disparities, there is relatively little empirical research documenting this phenomenon.”[1] Building on existing Indigenous knowledge and qualitative research, population-based studies offer an opportunity to better understand how these impacts extend across generations.

Ethics Approval

The study received approval from the University of Manitoba Health Research Ethics Board (#HS26950-H2025:160) and the Provincial Health Research Privacy Committee (PHRPC# P2025-37).

Participant Recruitment and Informed Consent

The study design and recruitment strategy were developed in consultation with the NCTR Survivors Circle. Following its recommendations, the NCTR invited Manitoba Survivors and Descendants to participate in the study. Informed consent was required to link participants' residential school records with administrative data held at MCHP.

Survivors and Descendants were contacted by four different approaches:

1. **Previously expressed interest:** The NCTR contacted Survivors who had previously expressed interest in participating in research by telephone or email.
2. **Ongoing records searches:** Survivors who were already working with NCTR archivists to locate records of their residential school attendance were invited to participate during routine follow-up communications.
3. **New inquiries:** Survivors and Descendants who contacted the NCTR to inquire about residential school records were invited to participate. At the time of recruitment, the NCTR was receiving approximately 40 such inquiries per month.

[1] The intergenerational effects of Indian Residential Schools: Implications for the concept of historical trauma. Amy Bombay, Kimberly Matheson, Hymie Anisman. Transcult Psychiatry. 2014 Jun;51(3):320–338. 10.1177/1363461513503380

4. **Public invitation:** The NCTR distributed a recruitment poster approved by the Survivors Circle, inviting interested Survivors and Descendants to contact the research team.

Individuals who expressed interest received a consent form by email or mail, which they could review at their own pace. They were encouraged to contact the NCTR with questions about the study or the use of their information before deciding whether to participate.

The NCTR was responsible for obtaining, documenting, and managing participant consent. For Survivors who had provided testimony to the Truth and Reconciliation Commission of Canada, consent forms completed at the time of their testimony were securely maintained in the NCTR Archives.

A total of 33 individuals consented to participate. Their Personal Health Identification Numbers (PHINs), or other identifying information, were securely transferred to the Provincial Information Management & Analytics (PIMA) team at Manitoba Health. PIMA replaced the PHINs with scrambled identifiers before transferring the information to MCHP. These identifiers enabled the linkage of participant records across datasets in the Manitoba Population Research Data Repository.

Study Design

Linking the 33 participants' scrambled PHINs to the Repository allowed us to examine their interactions with publicly funded services in Manitoba. These linked data provided information on participants' health and health service use, educational outcomes, and involvement with the justice system.

To provide a basis for comparison, we created a matched control group of individuals with similar demographic and socioeconomic characteristics who were not identified as having residential school exposure. Controls were matched to participants on age (±1 year), sex, and neighbourhood income quintile, with up to 15 controls selected for each participant. Age and income quintile were measured as of March 31, 2024, for both groups.

Due to time constraints, additional characteristics that may influence health and social outcomes, such as geographic location, educational attainment, family structure, language, and community connections, were not included in the matching process. These factors could however be considered in future phases of the research.

Indicators of Interest

1. **Health and Health service use indicators**: Likelihood of being diagnosed with a chronic disease (diabetes, hypertension, arthritis, ischemic heart disease, heart

failure, respiratory illness), physician visits, hospital admissions, mental illness diagnoses, and suicide attempts.

2. **Education indicators**: Likelihood of high school graduation.
3. **Justice system indicators**: Likelihood of justice system involvement (being accused of a crime, being a witness to a crime, being a victim of a crime).

Study Period

We examined all indicators during the study period of April 1, 1995 to March 31, 2024.

Databases

The following databases within the Manitoba Population Research Data Repository were accessed for this study:

- **The Manitoba Health Insurance Registry** – provides basic demographic information like birthdate, sex, and postal code
- **Physician Claims/Medical Claims** – provides records of physician/nurse practitioner visits and diagnoses from those visits
- **The Drug Program Information Network** – provides information on prescription drugs dispensed
- **The Hospital Discharge Abstracts Database** – provides records of hospital admissions and stays
- **Enrolment, Marks, and Assessments** – provides data on students who enrolled in and graduated from the public school system
- **Prosecutions Information and Scheduling Management (PRISM)** – provides records of justice system involvement (accused of, witness to, victim of a crime)

Analyses

We used descriptive statistics to summarize the demographic characteristics of the study population, including age, sex, and income quintile (Table 1).

For each indicator, we calculated the number and percentage of individuals who experienced the outcome during the study period. These percentages represent the risk, or likelihood, of experiencing each outcome among Survivors and Descendants compared with matched controls (Table 2).

We also calculated risk ratios using generalized linear models to compare outcomes between the two groups. A risk ratio indicates how much more or less likely an outcome is in one group relative to the other. Results are presented in Table 2, with further details on the statistical models and tests of differences between groups provided in the Appendix.

Review of Preliminary Results

The pilot study results were shared with the NCTR team for interpretation and discussion with Survivor and Descendant representatives. Their feedback was incorporated into this report before finalizing.

Results

Description of Study Population

Table 1 summarizes the demographic characteristics of the 33 Survivors and Descendants who participated in the study and their 495 matched controls.

Participants ranged in age from 30 to 75 years, with an average age of 58.9 years and a median age of 64 years. Approximately two-thirds of the study population (66.7%) were female, and just over half (51.5%) lived in rural areas. Some income quintile values were suppressed to protect participant confidentiality because of the small sample size.

The matched control group had nearly identical distributions of age, sex, and income quintile, reflecting the characteristics used to select controls. However, the groups differed in their geographic distribution, which was not considered during matching. Just over half (51.5%) of Survivors and Descendants lived in rural areas, compared with 37.8% of matched controls.

What Table 1 Tells Us

Matching helped ensure that the Survivors and Descendants and control groups were similar in age, sex, and neighbourhood income level. This makes comparisons of their health, education, and justice system outcomes more meaningful by reducing the influence of these characteristics on differences between groups.

However, matching does not account for every factor that may influence these outcomes. We still see some differences, for example, in geographic location and other social circumstances, that could contribute to the patterns of study outcomes.

Table 1. Sociodemographic Characteristics of the Study Population

Residential School Survivors & Descendants with Matched Controls

	Survivors & Descendants	Matched Control Group
Total Number of People	33	495
Age (years)		
Mean (standard deviation)	58.9 (11.9)	58.9 (11.7)
Median	64	64
Range	30-75	30-75
Sex		
Male	11 (33.3%)	165 (33.3%)
Female	22 (66.7%)	330 (66.7%)
Income Quintile		
Not found	s	15 (3.0%)
Q1	6 (18.2%)	90 (18.2%)
Q2	11 (33.3%)	165 (33.3%)
Q3	s	45 (9.1%)
Q4	7 (21.2%)	105 (21.2%)
Q5	s	75 (15.2%)
Geography of Residence		
Urban	16 (48.5%)	308 (62.2%)
Rural	17 (51.5%)	187 (37.8%)

s: suppressed due to small size. Q1 is the lowest income quintile; Q5 is the highest income quintile.

Scope of Results

This report presents findings from the first research objective only. Although the analysis of educational outcomes (Objective 2) was completed, fewer than 10% of study participants could be linked to education records. This was largely because the available education data begin in 1995, well after most participants would have completed high school. The small number of linked records prevented meaningful reporting, as all of the results would require suppression to protect participant confidentiality. Future research could revisit this objective with a greater focus on Descendants, whose educational experiences are more likely to be captured in the available data.

The analysis of justice system outcomes (Objective 3) could not be completed because of delays in obtaining the necessary data access approvals. This work may proceed once approvals are in place.

Health and Health Service Use of Residential School Survivors and Descendants

Table 2 compares health outcomes and health service use among Residential School Survivors and Descendants with those of the matched control group. The table presents the number of individuals who experienced each outcome, the proportion of each group affected, and the risk ratio comparing the two groups.

Understanding Risk and Risk Ratios

The *risk of an indicator* represents the proportion of individuals who experienced a particular health outcome during the study period (April 1, 1995, to March 31, 2024). For example, 23 of the 33 Survivors and Descendants (70%) had a diagnosis of diabetes, compared with 129 of the 495 matched controls (26%).

A *risk ratio* compares these proportions between groups. A risk ratio greater than 1 indicates that an outcome was more common among Survivors and Descendants, while a value below 1 indicates that it was less common. For diabetes, the risk ratio was 2.67, meaning that Survivors and Descendants were 2.67 times more likely to have a diabetes diagnosis than matched controls.

Understanding Statistical Significance

Statistical significance helps us assess whether an observed difference between groups is consistent with more than random variation. In this study, differences were considered statistically significant when the p-value was less than 0.05. However, statistical significance does not necessarily indicate the size or importance of a difference, nor does a non-significant result mean that the groups are equivalent.

Statistically significant risk ratios are shown in bold in Table 2. Additional statistical details, including confidence intervals and p-values, are provided in the Appendix.

What Table 2 Tells Us

Survivors and Descendants had significantly higher risks of several chronic health conditions compared with matched controls. These included diabetes (2.67 times the risk), hypertension (1.36 times), ischemic heart disease (1.63 times), and respiratory illness (1.43 times). Survivors and Descendants were also more likely to have experienced a hospital admission (1.49 times the risk).

Although the observed risks of mood or anxiety disorders, substance use disorders, and suicide attempts were higher among Survivors and Descendants, these differences were not statistically significant.

Risk ratios could not be estimated for some outcomes because of the small number of individuals affected. Given the limited sample size, these findings should be interpreted cautiously. Larger studies are needed to better understand differences in health and health service use among Residential School Survivors and Descendants and to examine the broader intergenerational impacts of residential schools.

Table 2. Health and Health Service Use Outcomes

Comparing Residential School Survivors & Descendants with Matched Controls

Health and Health Service Use Indicators	Number of People		Proportion of People with Indicator		Risk Ratio
	Survivors & Descendants	Matched Control Group	Survivors & Descendants	Matched Control Group	
Total Number	33	495	33	495	
Chronic Disease					
Diabetes	23	129	0.70	0.26	**2.67**
Hypertension	31	342	0.94	0.69	**1.36**
Congestive Heart Failure	s	s	s	s	1.76
Ischemic Heart Disease	26	239	0.79	0.48	**1.63**
Respiratory Illness	27	283	0.82	0.57	**1.43**
Arthritis	28	377	0.85	0.76	1.11
Health Service Use					
Hospital Admission	27	271	0.82	0.55	**1.49**
Physician Visit	33	488	1.00	0.97	n/a
Mental Health					
ADHD	0	11	0	0.02	n/a
Mood or Anxiety Disorder	22	271	0.67	0.55	1.22
Personality Disorder	0	13	0	0.03	n/a
Psychosis	0	11	0	0.02	n/a
Substance Use Disorder	10	86	0.30	0.17	1.74
Suicide Attempt	s	s	s	s	5.00

Bold text indicates the risk ratio is statistically significant at $p<0.05$. “n/a” indicates risk ratio was not available (models did not converge due to low numbers). “s” indicates the value is suppressed because of low numbers.

Discussion

This pilot study represents an important first step in exploring how historical residential school records can be linked with population-based administrative data to better understand the health and wellbeing of Residential School Survivors and their Descendants. The study demonstrates the potential of these linked data to complement and build on the knowledge Indigenous Peoples carry with them about their own and their family and community members' experiences at residential schools.

The findings suggest that Residential School Survivors and their Descendants experience a greater burden of certain chronic health conditions and health service use than other Manitobans with similar demographic and socioeconomic characteristics. Survivors and Descendents who participated in the study were more likely than matched controls to have been diagnosed with diabetes, hypertension, ischemic heart disease, and respiratory illness, and to have been admitted to hospital. Although this study cannot determine whether residential school experiences directly contributed to the differences observed, these findings are consistent with longstanding concerns about the lasting health impacts of residential schools on the children who were forced to attend them.

The following limitations should be kept in mind when interpreting these results. The study included only 33 individuals. Their experiences may not fully reflect those of the broader Survivor and Descendant population in Manitoba or Canada. Although the comparison group was matched on age, sex, and neighbourhood income, other factors that can influence health, including geographic location, access to services, and family and community support, were not accounted for. The small sample also limited our ability to draw conclusions about less commonly occurring (or less commonly reported) outcomes, particularly mental health conditions and suicide attempts.

The pilot study also identified important areas that can be expanded upon in future research. Historical education records were unavailable for most participants, and delays in data access approvals prevented the analysis of justice system outcomes. A larger study population, particularly of Descendents, would be helpful for digging into these analyses.

But despite these limitations, the pilot provides a strong foundation for future studies. A larger study could examine a broader range of health and social outcomes, distinguish between the experiences of Survivors and Descendants, and incorporate additional information about the factors that shape health and wellbeing. Combining linked administrative data with other research approaches (for example, qualitative

approaches) could provide a more complete understanding of these experiences, including the strengths and resilience of Indigenous families and communities.

Overall, this work offers an opportunity to build on Indigenous knowledge and contribute evidence that can inform culturally relevant, Indigenous-led policies, programs, and services supporting the wellbeing of Survivors, Descendants, and future generations.

Appendix

Statistical Models and Statistical Significance

All statistical analyses were performed using SAS Software (Version 9.4).

We used a log-binomial model with binomial distribution and a log link function to generate the risk ratios comparing cases and matched controls. The least-squares means (LSmeans) statement was used to produce the risk of outcomes for the case and control groups. Models included only the exposure variable as an independent variable; no other adjustment was made. Risk ratios were calculated as the ratio of risk between case and control groups (risk for case divided by risk for control groups).

Statistical significance was evaluated using 95% Wald confidence intervals and two-sided p-values, with significance set at alpha = 0.05. We examined goodness of fit and model convergence using Akaike's Information Criterion and Schwarz's Bayesian Criterion. We only reported output from models that converged.

In Table A1 on the next page, we have reproduced Table 2 and added confidence intervals and p-values from these tests.

Table A1. Health and Health Service Use Outcomes with Confidence Intervals and p-Values

Health and Health Service Use Indicators	Number of People		Proportion of People with Indicator		Risk Ratio	Confidence Intervals	p-Value
	Survivors & Descendants	Matched Control Group	Survivors & Descendants	Matched Control Group			
Total Number	33	495	33	495			
Chronic Disease							
Diabetes	23	129	0.70	0.26	**2.67**	**2.04, 3.50**	**<.0001**
Hypertension	31	342	0.94	0.69	**1.36**	**1.22, 1.51**	**<.0001**
Congestive Heart Failure	s	s	s	s	1.76	0.43, 7.32	0.43
Ischemic Heart Disease	26	239	0.79	0.48	**1.63**	**1.33, 1.99**	**<.0001**
Respiratory Illness	27	283	0.82	0.57	**1.43**	**1.20, 1.71**	**<.0001**
Arthritis	28	377	0.85	0.76	1.11	0.96, 1.30	0.16
Health Service Use							
Hospital Admission	27	271	0.82	0.55	**1.49**	**1.25, 1.79**	**<.0001**
Physician Visit	33	488	1.00	0.97	n/a	n/a	n/a
Mental Health							
ADHD	0	11	0	0.02	n/a	n/a	n/a
Mood or Anxiety Disorder	22	271	0.67	0.55	1.22	0.94, 1.57	0.13
Personality Disorder	0	13	0	0.03	n/a	n/a	n/a
Psychosis	0	11	0	0.02	n/a	n/a	n/a
Substance Use Disorder	10	86	0.30	0.17	1.74	1.00, 3.03	0.48
Suicide Attempt	s	s	s	s	5.00	0.53, 46.76	0.16

Bold text indicates that the risk ratio is statistically significant at $p<0.05$. “n/a” indicates that the risk ratio was not available (models did not converge due to low counts). “s” indicates the value is suppressed because of low counts.