



Language improves health and wellbeing in Indigenous communities: A scoping review

Louise Harding^{a,1} , Ryan DeCaire^{b,c} , Ursula Ellis^d , Karleen Delaurier-Lyle^{e,2} ,
Julia Schillo^{f,2,3} , Mark Turin^{f,g,*} 

^a School of Population and Public Health, Department of Medicine, University of British Columbia, 2206 East Mall, Vancouver, BC V6T 1Z3, Canada

^b Centre for Indigenous Studies, University of Toronto, Centre for Indigenous Studies, North Borden Building, Room 219, 563 Spadina Avenue, Toronto, ON M5S 2J7, Canada

^c Department of Linguistics, University of Toronto, Sidney Smith Hall, 4th floor, 100 St. George St, Toronto, ON M5S 3G3, Canada

^d Woodward Library, University of British Columbia, 2198 Health Sciences Mall, Vancouver, BC V6T 1Z3, Canada

^e X̱wi7̱x̱wa Library, University of British Columbia, 1985 West Mall, Vancouver, BC V6T 1Z2, Canada

^f Institute for Critical Indigenous Studies, University of British Columbia, 1866 Main Mall, Buchanan E156, Vancouver, BC V6T 1Z1, Canada

^g Department of Anthropology, University of British Columbia, 2104-6303 NW Marine Drive, Vancouver, BC V6T 1Z1, Canada

ARTICLE INFO

Keywords:

Indigenous health
Language revitalization
Language reclamation
Scoping review
Public health

ABSTRACT

Introduction: Indigenous languages in Australia, Canada, New Zealand and the United States are endangered due to colonial policies which promote English language dominance. While Indigenous communities know the importance of language for their wellbeing, this topic has only recently received attention in scholarship and public policy. This scoping review synthesizes and assesses existing literature on the links between the vitality of Indigenous languages and health or wellness in four English-speaking settler colonial countries.

Methods: Our interdisciplinary research team followed JBI methodology for scoping reviews. Key databases searched included MEDLINE, PsycInfo, and Cumulative Index to Nursing and Allied Health Literature. Searches were restricted to English language literature. The last search was on February 8, 2021. Quantitative and qualitative analyses were conducted to categorize and elucidate the nature of the links reported.

Results: Over 10,000 records were reviewed and 262 met the inclusion criteria – 70 % academic and 30 % gray literature. The largest number of studies focus on Canadian contexts (40.1 %). 78 % of the original research studies report only supportive links between Indigenous languages and health, while 98 % of the literature reviews report supportive links. The most significant aspects of health reported to be positively related to language are outcomes from health care, education and promotion initiatives; overall health, wellness, resilience and healing; and mental, cognitive, and psychological health and development. The results of the remaining original research studies are mixed (10 %), statistically non-significant (6 %), adverse (5 %) and neutral (1 %).

Conclusions: The results of this scoping review suggest that a vast body of academic and gray literature exists to support that language is a determinant of health for Indigenous peoples in the contexts studied. Recommendations for harnessing the healing effects of language include increasing tangible support to language programs, delivering linguistically tailored health care, and advancing knowledge through community-engaged research and education.

* Corresponding author at: Institute for Critical Indigenous Studies, University of British Columbia, 1866 Main Mall, Buchanan E156, Vancouver, BC V6T 1Z1, Canada

E-mail addresses: hlouise@alum.ubc.ca (L. Harding), ryan.decaire@utoronto.ca (R. DeCaire), ursula.ellis@ubc.ca (U. Ellis), karleen.delaurier-lyle@ubc.ca (K. Delaurier-Lyle), schilloji@gmail.com (J. Schillo), mark.turin@ubc.ca (M. Turin).

¹ Present address: Sydney Medical Program, Department of Medicine, The University of Sydney, Edward Ford Building (A27), Fisher Road, Camperdown, NSW, 2050 Australia

² These authors contributed equally to this work

³ Present address: Department of Linguistics, Simon Fraser University, 8888 University Drive, Robert C. Brown Hall Building, Room 9217, Burnaby, BC, V5A 1S6 Canada

<https://doi.org/10.1016/j.laheal.2025.100047>

Received 9 September 2024; Received in revised form 11 March 2025; Accepted 11 March 2025

Available online 17 April 2025

2949-9038/© 2025 The Author(s). Published by Elsevier B.V. on behalf of Shandong University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

“In Navajo we say nihizaad hiná ‘our language is alive.’ This idea [and the worldview that comes with it] represents a very different epistemological orientation than one that focuses on language only for its utility or potential for economic prosperity. Our commitments to our languages are commitments to who we are as peoples. It is within us to keep them alive.” (McKenzie, 2020, p. 506)

Each language offers a unique way of understanding and categorizing the world, reflecting insights into history, knowledge, and culture (Sapir, 1929; Shaw, 2001; Turin, 2012). Given this connection, the decline in the use of Indigenous, minoritized and under-resourced languages—through colonization, displacement, denigration, and assimilative education policies—has had and continues to have dramatic and deleterious effects on speech communities (United Nations Economic and Social Council, 2016). In recent years, the nature of the connection between linguistic vitality⁴ and Indigenous community health has gained increasing attention among scholars, policy makers, and language practitioners (First Peoples’ Cultural Council, 2018; Hallett et al., 2007; House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs, 2012; McIvor et al., 2009). Curiously, while a growing body of publications support and assert the existence of a link between linguistic vitality and health, a relatively limited body of research data and evidence is currently leveraged to tell this story. In this scoping review, we synthesize, analyze and assess the current evidence on the connections between Indigenous languages and health to inform supportive policy and decisions about resource allocation.

1.1. Indigenous languages in Anglo settler societies

In this review, we focus on the languages spoken by the original inhabitants of Canada, the United States of America, Australia, and Aotearoa New Zealand, who share the unique experience of Anglo settler colonialism. Settler colonialism, as described by historian Patrick Wolfe, is a system which “strives for the dissolution of native societies” and “erects a new colonial society on the expropriated land base” (Wolfe, 2006, p. 388). The term settler refers to the founders of these colonial societies, their descendants, and subsequent immigrants. Anglo settler colonialism specifically aims to replace or assimilate Indigenous populations with a new society of English-speaking settlers, and often involves a government-sanctioned commitment to English language monolingualism (Smándych, 2013; Veracini, 2010). An exception to Anglophone dominance within this context is French dominance in Eastern Canada, and particularly in the province of Québec, where it is the only official language and exerts pressures on Indigenous languages similar to that exerted by English in the rest of Canada (Patrick, 2005).

Language endangerment and language oppression are global issues (Pine & Turin, 2017; Roche, 2022). The United Nations has estimated that 40 % of the languages spoken around the world today are at risk of disappearing as colonial languages like English and Spanish dominate other speech forms (Requesens-Galnares, 2023; Turin, 2012). Indigenous languages are particularly threatened, resulting in the recognition of the rights to use, speak and transmit Indigenous languages being codified in the United Nations Declaration of Rights of Indigenous Peoples (UNDRIP) (United Nations General Assembly, 2007), and the subsequent announcement of 2022–2032 as the International Decade of Indigenous Languages (UNESCO, 2020).

In Anglo settler contexts, attempts to forcibly introduce English have included prohibiting the use of Indigenous languages (Mako, 2012), forcibly removing children from their homes and communities (Canadian Council of Provincial Child and Youth Advocates, 2010;

Royal Commission of Aboriginal Peoples, 1996; Wilson, 1997), and denigrating and punishing speakers of Indigenous languages (The Aboriginal Healing Foundation, 2006). The results have been devastating for many Indigenous communities and for the flourishing of their languages (Davis, 2018; Davis, 2017; Perley, 2011). In this context, Indigenous-led initiatives to maintain, revitalize, and reclaim languages are acts of Indigenous sovereignty, resistance and resurgence (J. L. Davis, 2018; Perley, 2011; Simpson, 2017).

Language revitalization programs very often take the form of multidisciplinary, heterogeneous, innovative interventions to offset the global decline in linguistic diversity (Pine & Turin, 2017). By way of tangible example, on the eastern side of Canada, co-author Ryan DeCaire is a Kanien’kéha (Mohawk language) learner, instructor and researcher, whose work is principally focused on developing and employing Kanien’kéha adult immersion programs which serve as a pathway for adults to become highly proficient in Kanien’kéha so that they can create and foster immersion and Kanien’kéha-medium environments in critical community domains and thus work to restore intergenerational transmission. Similarly, co-author Mark Turin’s work with the Heiltsuk First Nation in British Columbia is aimed at creating “new opportunities for speaking, writing and reading the Heiltsuk language” [Híłzaqv/Háíłzaqv] with the objective to “expand and deepen existing community language revitalization and cultural documentation in a digital environment,” (Carpenter et al., 2021, p. 2).

In recent decades, at the government level, the four countries covered in this scoping review have made some moves to recognize Indigenous language rights (Skutnabb-Kangas & Phillipson, 2023). These include designating official language status for the Indigenous te reo Māori language in Aotearoa New Zealand (Māori Language Act, 1987; Te Ture Mō Te Reo Māori/ Māori Language Act, 2016), and introducing Indigenous language acts in the USA (Native American Languages Act, 1990), Canada (Indigenous Languages Act, 2019), and the state of New South Wales in Australia (Aboriginal Languages Act, 2017). While such efforts are encouraging steps, there is not always a direct link between the granting of rights or recognition and tangible, meaningful, long-term support for Indigenous communities (Coulthard, 2014; Inutiq, 2016; Patrick, 2005). Indigenous language revitalization initiatives continue to be challenged by a lack of sustainable, consistent, and dedicated funding and supportive legislative policies (Carpenter & Tsykarev, 2020; Haque & Patrick, 2015; Hinton & Meek, 2018; Olawsky, 2020).

1.2. Indigenous languages and health

In the wider context of endangerment and revitalization, and in embodied and tangible ways, Indigenous communities have always known of the connections between the vitality of their languages, their health, and their well-being. Meanwhile, a growing awareness of these connections among the broader public and particularly within public health, language sciences, and other scientific communities can be harnessed to help advance the case for resource allocation and public policies that are dedicated to supporting linguistic diversity and language revitalization. As a case in point, a groundbreaking 2007 study by Hallett and colleagues reported a strong correlation between community-level Indigenous language knowledge and reduced youth suicide rates in British Columbia First Nations communities (Hallett et al., 2007). The report captured the attention of Canada’s Prime Minister Justin Trudeau who referenced it in an interview as an example of why it is important to support Indigenous communities to “teach language and culture and take pride in identity” (House, 2016). While the data that was analyzed in that study is now over 25 years old, it continues to have a significant influence worldwide.

An influential piece of gray literature on this emerging topic was a 2012 inquiry into language learning in Indigenous communities from the Australian House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs (House of Representatives

⁴ Linguistic vitality, a key concept in understanding language endangerment, measures how often a given language is used in different social contexts.

Standing Committee on Aboriginal and Torres Strait Islander Affairs, 2012). The committee conducted 23 public hearings, received more than 154 submissions, and produced a 256-page report, with a particular focus on how supporting Indigenous languages contributes to the ‘Closing the Gap’ campaign, which aims to address the disparities between Indigenous and non-Indigenous Australians in areas including health and life expectancy (Australian Government, 2020). A particularly powerful quote from Why Warriors Pty Ltd and the Arnhem Human Enterprise Development project is:

“We see that valuing and supporting the use of Indigenous languages is vital to “closing the gap” – and indeed, that the gap will not otherwise ever be closed.” (House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs, 2012, p. 22, emphasis added)

While the report was impactful, the committee’s recommendation to recognize Aboriginal and Torres Strait Islander peoples and their languages in the Australian constitution has still not been implemented, and remains a highly divisive topic among the Australian public (Ritchie, 2023).

Both of the above examples also highlight the value of Indigenous peoples’ more holistic ways of viewing health, which can include keeping Indigenous languages alive as a determinant of health. Indeed, attempting to define how Indigenous communities view health can be limited by challenges around translation and even conceptual incommensurability (Boddington & Raisanen, 2009). As such, there is a clear need to identify and showcase the diversity of evidence on the topic of language and health in Indigenous communities across a range of definitions of health, wellness, and wellbeing in order to advance awareness, advocacy, and action.

In this scoping review, our goal is to generate lasting impact by conducting the most comprehensive, systematic, and rigorous synthesis and assessment of evidence to date on the links between Indigenous languages and health in Anglo settler countries, and to deliver recommendations based on our findings. In addition, we hope to clarify the nature of the links between Indigenous languages and health to allow greater nuance and specificity in relevant discussions and initiatives. To that end, we apply a scoping review methodology to investigate a simple research question:

What is the extent and scope of the literature on the relationships between Indigenous linguistic vitality and the health/wellness of Indigenous populations in Australia, Canada, New Zealand, and the United States of America?

2. Methods

2.1. Positionality statement and description of collaboration

This work was led by Louise Harding (hereafter LH) and Mark Turin (MT) who sought collaborative input, critical advice, and insight from Ryan DeCaire (RDC), Ursula Ellis (UE), Karleen Delaurier-Lyle (KDL) and Julia Schillo (JS). Ryan DeCaire is Kanien’kehá:ka (Mohawk) and Karleen Delaurier-Lyle is of Anishinabek and Cree mixed-settler ancestry and a member of the Berens River First Nation. Louise Harding, Ursula Ellis, Julia Schillo, and Mark Turin are non-Indigenous academics working in Canada and Australia. Members of our multidisciplinary team brought knowledge in fields spanning the information sciences, Indigenous language documentation and revitalization, linguistics, population and public health, ethics, food sovereignty, and Indigenous wellness. In the remainder of the manuscript, we use the acronyms introduced above to refer to the authors.

2.2. Protocol and registration

Our protocol was drafted in accordance with the Joanna Briggs

Institute (JBI) methodology for scoping reviews, setting out the background, research question, eligibility criteria for studies, and methods (Peters et al., 2020). We selected a scoping review methodology because it offers a systematic approach to collecting and synthesizing literature that allows for a broad research question. Further, it does not require evidence appraisal, which can at times be problematic when Western research tools are applied to evaluate Indigenous ways of knowing due to key epistemological, ontological, and methodological differences (Chambers et al., 2018; Kovach, 2021; Smith, 2021).

Further, the scoping review approach allowed us to survey the full range of variables relating to linguistic vitality, revitalization and language use as well as to health and wellness, rather than focusing narrowly on highly specific independent and dependent variables at this relatively early stage of inquiry. We included gray literature in our review, or literature published outside of traditional academic publishing channels, to include publications that might be relevant to Indigenous communities. The gray literature search strategy was guided by a template produced by Jackie Stapleton, based on the methods used in a systematic review by Godin et al. (2015). Our final protocol was registered prospectively with the Open Science Framework on 26 January 2021 (Appendix A) (Harding, Delaurier-Lyle, et al., 2021). Reporting follows the PRISMA- Scr Checklist (Appendix B).

2.3. Eligibility criteria

In order to be included in this review, literature was required to have a central focus on making connections between the health or wellbeing of Indigenous communities and Indigenous linguistic vitality, including language use, knowledge, maintenance, transmission, teaching, revitalization, and reclamation, as well as other structures and initiatives that support or undermine linguistic vitality.

Health and wellbeing were considered broadly in an attempt to encompass a wide range of the worldviews represented in the literature (Boddington & Raisanen, 2009). Individual and community wellness were included within the full spectrum of prevention, determinants of health, health promotion, health outcomes, healing, and spiritual wellbeing. Measures of community wellbeing that were outside of this scope included economic wellbeing, graduation rates, employment rates, and housing adequacy.

Indigenous communities in Canada, the United States of America and its territories, Australia, and the Realm of New Zealand were included. Even though the French language is dominant in Québec and other parts of eastern Canada, we chose to include these regions for reasons of feasibility and on account of common contextual features that are shared with the rest of Canada, including ties to England through the Commonwealth. Further, as French has co-official language status in Canada, it has a high degree of politically and culturally reinforced esteem and thus receives greater support than do Indigenous languages (Davis, 2017).

Eligible sources of evidence for our review included academic articles, book chapters indexed in academic databases, theses (undergraduate and graduate), dissertations, conference proceedings and abstracts, course syllabi, and government documents written in English. We also included reports and fact sheets published by various stakeholders including universities, associations, non-governmental organizations (NGOs), intergovernmental organizations (IGOs) and research agencies. We excluded informal communications such as blogs, emails, and social media posts, magazines, newspaper articles, trade publications, non-scholarly books, and books published by vanity or predatory publishers. We only included literature published in English due to feasibility limitations including the language knowledge of the study team, limited resources, and in recognition of the global dominance of English in the landscape of academic publishing. No date limits were applied to inclusion.

2.4. Information sources and search

We searched the following academic bibliographic databases on January 26, 2021: MEDLINE (Ovid), PsycInfo (EBSCO), Cumulative Index to Nursing & Allied Health Literature (CINAHL Complete: EBSCO), Bibliography of Native North Americans (EBSCO), Australian Education Index (ProQuest), Educational Resource Information Centre (ERIC: EBSCO), MLA International Bibliography (EBSCO), Web of Science Core Collection, Communication & Mass Media Complete (EBSCO), and Linguistics and Language Behavior Abstracts (LLBA: ProQuest) (Appendix C).

To locate unpublished studies and gray literature, we searched the following databases between January 26 and February 8, 2021: desLibris, PsycEXTRA (EBSCO), Native Health Database, iPortal, ProQuest Dissertations & Theses Global, Theses Canada, OAIster, Analysis & Policy Observatory, Informit Indigenous Collection, and Advanced Google. To complete our gray literature search strategy, we also conducted targeted website searching and solicited articles from members of the research team and their colleagues (Appendix D). Finally, we screened the reference lists of all included sources to locate additional studies that might be relevant.

The search strategies were drafted by LH with librarians UE and KDL, piloted in Ovid MEDLINE, and discussed with other members of the research team (Appendix A). We created a list of keywords and subject headings which pertained to Indigenous populations in each of the four countries as well as to language, linguistics, revitalization, and reclamation (Appendix C and D). LH executed the search of all databases. Citations were exported from databases into the reference management software Zotero, which flagged duplicates for manual review and removal. References were then imported into Covidence for screening and data extraction. Covidence automatically identified some additional duplicates which were reviewed and removed.

2.5. Selection of sources of evidence

To establish congruence, LH and JS conducted two pilot tests of the inclusion criteria and screening process on 35 titles and abstracts in November 2020 and January 2021. Following the official search, LH and JS independently screened all titles and abstracts from the academic databases for assessment against the inclusion criteria using Covidence and then sought consensus. LH subsequently screened the full texts of all articles that had been included. LH independently screened the gray literature sources in two stages analogous to the academic database records screening process. MT assisted in resolving any discrepancies or ambiguities in study selection. We noted reasons for exclusion of sources of evidence at the full text review stage.

2.6. Data charting process

To avoid double counting, we used studies, rather than reports or publications, as the units of interest, since studies can be reported in several sources (e.g., in both a journal article and a dissertation) (Li et al., 2022). Therefore, we identified and collated multiple reports of single studies before completing data charting. LH and MT jointly developed a data charting form that was iteratively refined throughout the extraction process (Appendix E), after which LH independently charted the data. After piloting the form on a sample of 61 diverse studies from the academic and gray literature, the research team met to review the preliminary findings and to discuss refinements to the data charting form and synthesis strategy before completing the data charting process.

2.7. Data items

Data from each study was abstracted on year of publication, geographic coverage, whether it was academic or gray literature, and

the specific type of publication. Studies were classified as original research if the authors presented new data, literature reviews if they primarily synthesized or commented on existing research, or mixed if they presented a balance of the two. Impactful quotes were noted, and brief summaries were prepared of each study's conclusions on the links between languages and health. To promote impartial reporting of results, only non-evaluative, dispassionate language was used in the summaries and the conclusions were drawn directly from the publications without further interpretation. Additional notes of potential relevance were included in the final column of the data charting form.

2.8. Synthesis of results

Data representing the year of publication, geographic coverage, whether a study was classified as academic or gray literature, specific publication types (journal article, report, etc.), and whether a study presented original research or was a review, were prepared and rendered as figures. A table was prepared for the appendix containing each citation, its geographic coverage and summary of results. Due to the iterative nature of a scoping review, we deviated slightly from the registered protocol at this step to report on geographic coverage instead of population characteristics, and to provide a more contextualized summary rather than just a comment on the relationships between Indigenous languages and health reported.

We committed to a qualitative analysis of the aspects of health and wellness captured in the study summaries using NVivo software (Release 1.7.1, QSR International). LH applied inductive content analysis methods to formulate thematic categories and subcategories (Elo & Kyngäs, 2008), using a rich coding strategy that allowed for each study to be assigned to more than one category or subcategory when applicable. An additional code was assigned to studies that analyzed national survey data to track how this distinct and prevalent study type was distributed thematically. Following the first round of coding, LH and MT consulted to refine the themes, continuing this same process in discussion with other members of the research team until the final set and labels were agreed upon.

Finally, we applied vote-counting methods to tabulate the direction of the link between linguistic vitality and health reported in each study (Bushman & Wang, 2009). This method was chosen because the effect measures varied widely across the studies. Each summary was assigned a code: supportive, adverse, statistically non-significant, neutral (i.e., the authors studied an aspect of health or wellness which they did not explicitly present as positive or negative), or mixed. We considered mixed to be its own category based on an assumption that these studies were distinct from those which concluded on only one type of link. To avoid double-counting studies, original research and literature reviews were tabulated separately. The results of studies that both analyzed original research data and performed a literature review were segregated and counted once in each category for this analysis (i.e., the findings from the literature review portion were counted as one review study, and the findings from the original research portion were counted as one original research study). As the vote-counting method can only provide a crude estimate of the true existence of a link between languages and health as it weighs each study equally without accounting for critical factors such as effect size, study quality, or validity (Bushman & Wang, 2009), the goal of this aspect of the analysis was only to obtain a perspective on what types of links between languages and health were reported in the included studies.

3. Results

We identified over 10,000 records: 9864 via academic databases and 298 via the gray literature search strategy and reference lists (Fig. 1). After duplicates were removed we screened a total of 8201 publications. We excluded 7063 at the title and abstract review stage due to irrelevance ($n = 7059$) or inaccessibility ($n = 4$). We reviewed 1122 full texts,

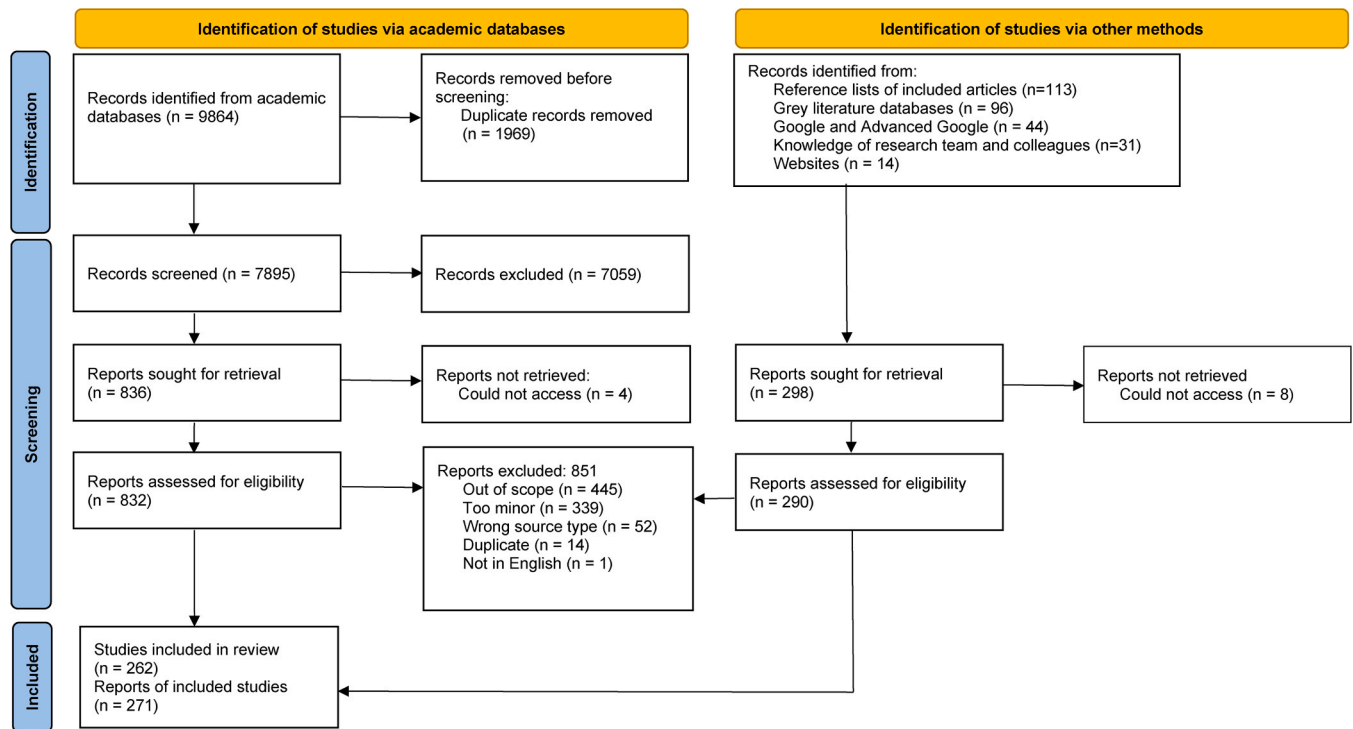


Fig. 1. PRISMA 2020 flow diagram showing the process for study inclusion. From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>.

and excluded 339 of these publications because the analyses and discussions of the links between Indigenous languages and health that they contained were too limited in depth, length, and/or specificity to satisfy our inclusion criterion of centrality. For example, a number of publications that focused on the links between culture and health and contained no more than a few sentences about language and which were not central to the overall thesis were excluded. We also removed 52 that did not meet the source type inclusion criteria, 14 that were duplicates, and one that was not written in English. After careful review, 262 studies met the inclusion criteria. Seven of the studies are reported in two or more publications, so that the total number of publications came to 271. References and brief summaries of each study are available in the [Supplementary Material Table S1](#).

3.1. High-level overview of the included studies

We classified 84 % (n = 220) of the studies as original research, 13 % (n = 33) as literature reviews, and 3 % (n = 9) as mixed research/reviews (Fig. 2). 70 % of the total publications are academic and 30 % are gray literature (Fig. 3A). The most prevalent source types are academic journal articles (67 %), followed by reports and informational documents (16 %), and then graduate theses, dissertations, and capstone projects (10 %; Fig. 3B). All except one of the journal articles are peer-reviewed, and we have chosen to include this one outlier nevertheless because it is one of the most widely cited in the field of Indigenous languages and health and is published in an open access journal that offers a post-publication peer review process with reviewer comments posted which denote approval with reservations (Whalen et al., 2016). All book chapters in the final sample are published by reputable scholarly publishers, where industry standards involve some form of review before publication.

Five of the included reviews surveyed aspects of the literature on the relationships between Indigenous linguistic vitality and health with similar scopes to ours reported here (Angelo et al., 2019; McIvor et al., 2009; Taff et al., 2018; van Beek, 2016; Whalen et al., 2016), one of

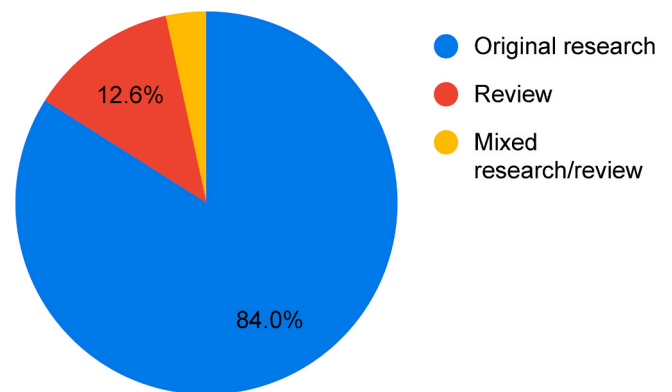


Fig. 2. Types of studies. Classification of all studies into original research, review, and mixed research/review (n = 262 studies). The unlabelled slice is mixed research/review, 3.4 %.

which was published in a peer-reviewed academic journal (McIvor et al., 2009). Of additional note is a realist review from 2022 which was not included due to the date cut-off rule but will be addressed in the discussion due to its relevance (Whalen et al., 2022). That review built on a 2016 report which is included in our sample (Whalen et al., 2016), and involved searching one database and citation chaining. The review conducted by our team distinguishes itself from all prior and existing reviews on the topic of which we are aware through our use of a large spectrum of databases and search terms, our application of the rigorous scoping review methodology, and our prospective registration of the study protocol.

The earliest date of publication included in our review is 1942, and at least one study has been published on the topic of languages and health every year since 1993 (Fig. 4). There was an increase in publications around the turn of the millennium, and 50 % of the total were published after 2013. Only 4 publications released in 2021 are captured in our

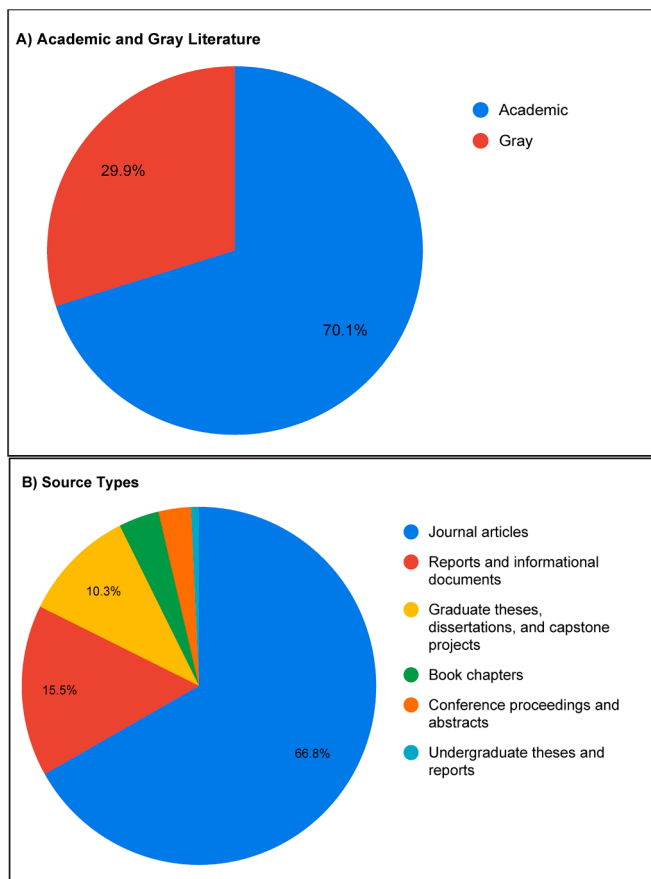


Fig. 3. Distribution of academic and gray literature and source types in the dataset. (A) Classification of all publications into academic and gray literature. (B) Source types of all publications. Unlabeled slices are conference proceedings and abstracts 3.0 %, and undergraduate theses and reports 0.7 %. Sample size is n = 271 publications for both charts, representing 262 studies.

scoping review as studies published after this cut-off were not included. The largest number of studies focus on the Canadian context, and the least on New Zealand (Fig. 5A). Proportionate to the size of the Indigenous populations in each country, populations in the USA are underrepresented in the dataset while populations in Australia and Canada are overrepresented (Fig. 5B) (Australian Bureau of Statistics, 2022; Statistics Canada, 2022; Stats NZ Tatauranga Aotearoa, 2022; United States Census Bureau, 2021). We encountered challenges when screening certain literature for inclusion about Pacific Islander peoples due to ambiguous usage of the population categories of Asian Americans and Pacific Islanders (AAP/), Asian/Pacific American (APA), and

Asian/Pacific Islander (API). As Asian peoples are out of scope of this review and only some Pacific Islander peoples are within the scope (i.e., peoples who are Indigenous to what are now known as the U.S. Pacific Islands region and the Realm of New Zealand), we had to exclude an estimated 35 studies that are otherwise relevant to this scoping study in which the results are neither clearly nor exclusively linked to these populations.

A variety of methods are applied in the studies, ranging from conventional quantitative and qualitative methods to public hearings and narrative presentations of lived experiences. Over ten percent (n = 32) of the original research studies analyze quantitative data from national population surveys, most commonly the Aboriginal Peoples Survey from Canada (n = 12) (Statistics Canada, 2012) and three national Australian surveys of Aboriginal and Torres Strait Islander peoples (n = 9) (Australian Bureau of Statistics, n.d).

3.2. Language variables in the dataset

The language variables in the studies span the spectrum of language use, proficiency, fluency, maintenance, learning, vitality, revitalization, reclamation, access to linguistically appropriate services, linguistic suppression and oppression, punishment for language use, and language loss and endangerment. There is notable variability in how language proficiency and frequency of use are measured in the dataset. For example, several studies analyzed data from the Canadian Aboriginal Peoples Survey (APS) which asks, “do you speak an Aboriginal language, even if only a few words?”, which is analyzed as a binary yes/no variable (Statistics Canada, 2012), while the three national Australian surveys ask for primary language at home (Australian Bureau of Statistics, n.d.). The 1996 Canadian census queried respondents’ ability to speak a language well enough to conduct a conversation (Norris & MacCon, 2004), which Hallett and colleagues used in their landmark 2007 study to compare communities where a majority of the members responded “yes” to this census question with those where a majority answered “no” (Hallett et al., 2007). Other research teams formulated their own language variables, such as Noreen et al. (2018) who asked respondents whether they speak the Cree language exclusively at home, and Russell (2018) who indexed a range of language competencies, from “respondents who could talk about ‘almost anything’, ‘many things’ or ‘some things’ in te reo Māori [...] [to] those who could only talk about ‘simple/basic things’ or ‘a few words or phrases,’” (p.9).

Angelo et al. (2019) address this diversity in the language variable in their own review and argue that it can complicate the understanding of the links between languages and health. They advocate for greater consideration of key mediators of the relationship between languages and health including the local configuration of languages (language ecologies), contexts of use, proficiency, and type of language, and assert that “what people report as ‘speaking an Indigenous language’ may be thought of differently in different ecologies” (Angelo et al., 2019, p. 19).

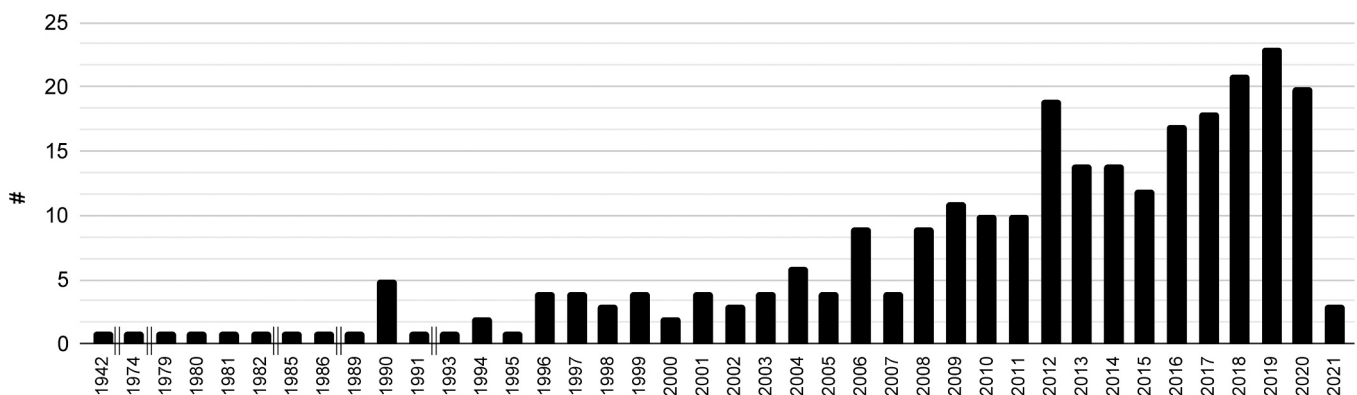


Fig. 4. Years of publication for all reports (n = 271). Double vertical lines || on the x-axis denote non-consecutive years.

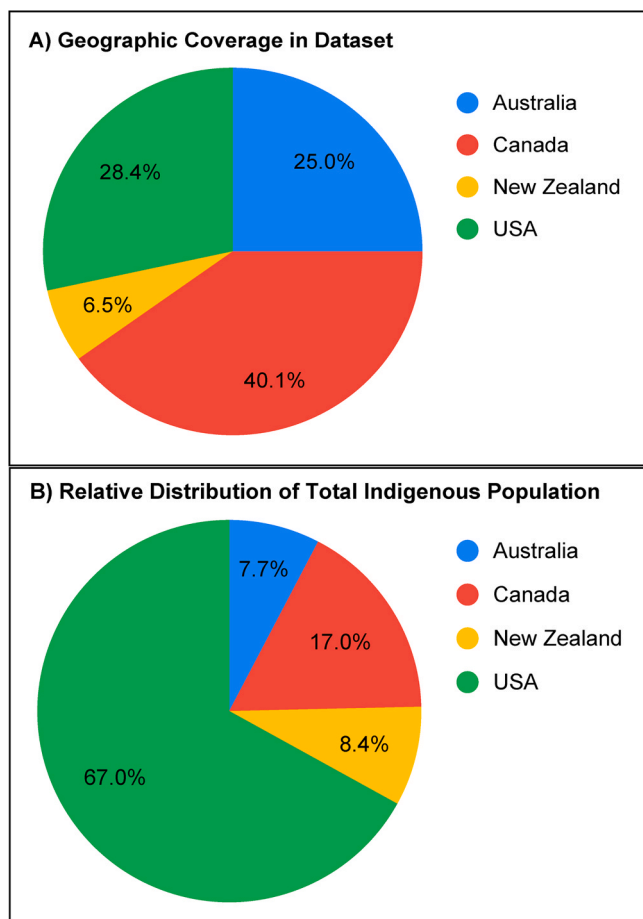


Fig. 5. Geographic coverage in dataset with comparison to the relative distribution of the total Indigenous population. (A) Geographic coverage of studies in the dataset, with 292 data points for 262 studies since some studies looked at populations in more than one country. (B) Distribution of the aggregated population of 10,387,728 Indigenous peoples between the four countries studied, for comparison (Australian Bureau of Statistics, 2022; Statistics Canada, 2022; Stats NZ Tauranga Aotearoa, 2022; United States Census Bureau, 2021).

3.3. Links between languages and health in original research studies

Of the 229 studies which present original research data, 78 % (n = 179) report supportive links between Indigenous linguistic vitality/revitalization and health/wellness, 10 % (n = 22) are mixed, 6 % (n = 14) are statistically non-significant, 5 % (n = 11) report adverse links, and 1 % (n = 3) are neutral (Fig. 6).

A wide range of measures of health and wellness are represented in the dataset (Table 1). Many studies examine multiple aspects of health and wellness and their interconnectedness:

“First Nations seek to achieve whole health—physical, mental, emotional, spiritual, social, and economic well-being—through a coordinated, comprehensive approach that respects, values, and utilizes First Nations cultural knowledge, approaches, languages, and ways of knowing.” (Thunderbird Partnership Foundation & Health Canada, 2015, p. 1)

Access to linguistically appropriate services emerged as an important dimension in relation to the links to health, encapsulating situations where Indigenous language speakers are supported to use “their first (i. e., the language they have learned as a baby) and strongest language [...] to access services or information which might otherwise be detrimental if English-only” (Angelo et al., 2019, p. 7). Questions of language access are mostly covered in the context of health services, but also

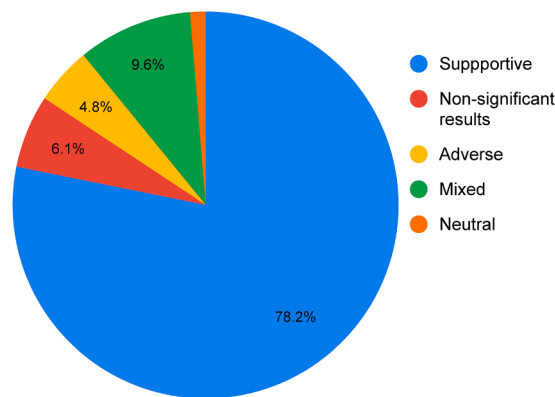


Fig. 6. Direction of links between Indigenous languages and health reported in studies presenting original research data (n = 229). The unlabeled slice is Neutral, 1.3 %.

include studies on the benefits of bilingual public signage (Townsend, 2014), food labels (Bird et al., 2008), and prescription labels (Meisel & Kiely, 1981).

3.4. Supportive links in original research

3.4.1. Health outcomes from linguistically appropriate health care, education, and promotion initiatives

The largest category overall contains reports that health outcomes are supported by linguistically appropriate health care, education, and promotion initiatives (n = 79), accounting for almost half (44 %) of all supportive studies. Almost a third of all studies in this category (n = 23) focus on Aboriginal and Torres Strait Islander peoples in the Northern Territory of Australia, and particularly those who live in remote areas. Most of the studies focus specifically on health care and assessment services (n = 67), while linguistically tailored patient education is a focus of eleven studies and health promotion is a focus of four. While these studies touch on a range of health conditions, brain health was a particularly salient focus, with 17 studies focusing on the need for linguistically appropriate assessment, treatment, and support for people with conditions such as dementia, traumatic brain injury, communication disorders, and in the field of speech-language pathology overall.

One study of a sample of 366 Inuit children who primarily spoke Inuktitut reports that three-quarters of the cohort were diagnostically misclassified by a commonly applied cognitive assessment scale, largely due to reasons of somewhat limited English language verbal comprehension (Wilgosh et al., 1986). In all cases, shortcomings in linguistically appropriate care are linked to lack of understanding by patients and worse outcomes such as incorrect diagnoses, low health literacy, misunderstanding of medical instructions, and feelings of alienation or not being respected. Even where interpreters are available in health care settings, many studies report that they are not consistently used. Such failings have been repeatedly identified over time and multiple calls have been made for urgent resolution:

“Anaesthetists would not consider providing anaesthesia for anyone who spoke little or no English without the assistance of an interpreter unless it was an extreme emergency. Despite this, over a two-month period at [Royal Darwin Hospital], 29 indigenous people with little or no English underwent anaesthesia without an interpreter. This problem is unlikely to be of recent onset or confined to [Royal Darwin Hospital] alone.” (Cheng et al., 2004, p. 546)

“If it’s a German speaking person we automatically go get that [interpreter services] straight away or find someone to do it. But if we want a Pitjantjatjara, or an Alyawarr speaking person, you know, we can use the interpreter speaking services, but we don’t.” (Artuso et al., 2013, p. 9)

Table 1

Links between languages and health in original research studies. Tabulation of the conclusions of each study presenting original research data on the direction of the link between Indigenous languages and health (n = 229).

Direction of link	Aspects of health
Supportive (n = 179)	Health care, education, and promotion outcomes (n = 79) Health care (n = 67) Patient education (n = 11) Health promotion (n = 4) Overall health, wellness, resilience, and healing (n = 68) Health and wellness, generally (n = 47) Trauma and healing (n = 25) Child and youth health and general development (n = 2) Mental, cognitive, and psychological health and development (n = 51) Identity (n = 17) Mental and emotional health and wellbeing generally (n = 9) Mood (n = 9) Suicide (n = 9) Self-esteem (n = 8) Cognitive and psychological health and development (n = 4) Stress (n = 4) Anxiety (n = 2) Health protective or risk factors and behaviors (n = 24) Social support and community connectedness or isolation (n = 13) Diet and movement (n = 6) Resilience (n = 4) Physical health and sickness (n = 11) Non-specific physical health, sickness, illness (n = 6) Specific illness or disease (n = 4) Spiritual wellbeing (n = 9) Substance use behaviors and addictions (n = 4)
Non-significant findings (n = 14)	Mental, cognitive, and psychological health and development (n = 6) Mood (n = 2) Cognitive and psychological health and development (n = 2) Health protective or risk factors and behaviors (n = 4) High-risk sexual behavior (n = 2) Physical health and sickness (n = 2) Overall health, wellness, resilience, and healing (n = 1) Substance use behaviors and addictions (n = 1)
Adverse (n = 11)	Health protective or risk factors and behaviors (n = 4) Cancer screening participation (n = 2) Substance use behaviors and addictions (n = 4) Overall health, wellness, resilience, and healing (n = 2) Physical health and sickness (n = 1)
Neutral (n = 3)	Accessing a traditional healer (n = 2) Substance use behaviors and addictions (n = 1)

Table 1 note: Only subcategories containing more than one study are included in the table for reasons of concision, and studies reporting mixed results are not included due to complexities in interpretation. Both are instead summarized in the text.

“The Committee considers it a national disgrace that an Indigenous person may face [...] a serious health issue without effective interpreting support.” (House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs, 2012, p. 183)

3.4.2. Overall health, wellness, resilience and healing

The second largest category (n = 68) contains studies on supportive links to overall health, wellness, resilience, and healing. 47 of these studies relate to health and wellness generally and non-specifically, including self-reported health status and quality of life. A third of the studies (n = 25) examine language suppression, denigration, and loss as

sources of trauma, and language teaching, learning, maintenance, and revitalization as opportunities for individuals and communities to heal, survive, and thrive (e.g., (Ball & Lewis, 2014; Brown, 2016; Cohen, 2001; Jacob et al., 2019). Two studies report that speaking and learning Indigenous languages supports the overall health and development of children and youth (Ball, 2006; Gerlach, 2018).

3.4.3. Mental, cognitive, and psychological health and development

The next largest category (n = 51) speaks to how mental, cognitive, and psychological health and development are supported by linguistic vitality and challenged by language loss and suppression. Most frequently studied are identity (n = 17), mental and emotional health and wellbeing generally (n = 9), aspects of mood including feelings of happiness or depression (n = 9), suicide rates (n = 9), and self-esteem (n = 8). Four studies report links between learning, speaking, or revitalizing Indigenous languages and better cognitive and psychological health throughout the lifespan (Counciller, 2011; Eckhart, 1983; Jacklin & Warry, 2010; Oldfield, 2016). The six remaining studies focus on stress (Cunningham & Paradies, 2012; England Aytes, 2015; Taff et al., 2018; Wilson, 1997) and anxiety (Brougham & Haar, 2013; Whitbeck et al., 2004). Overall, the community-engaged studies in this category tend to present the links between languages and mental health in a way that is holistic and within the context of multiple supportive factors, as described in a joint report by the Thunderbird Partnership Foundation and Health Canada:

“Mental wellness is supported by factors such as culture, language, Elders, families, and creation. It is necessary for healthy individual, family, and community life.” (Thunderbird Partnership Foundation, & Health Canada, 2015, p. 1)

3.4.4. Other supportive categories

Twenty-four studies focus on preventative and risk factors. Over half of these studies (n = 13) relate to social support and community connectedness, reporting that language use, revitalization, and preservation strengthen communities while language loss can challenge these connections and worsen health and wellbeing. One study presents this from the inverse perspective, reporting that the social isolation of Indigenous seniors can negatively impact linguistic vitality because of their important role in language transmission and preservation (Employment and Social Development Canada, 2018).

Six studies report links with improvements in dietary and movement patterns, including increased physical fitness and healthy weight loss by students in a language revitalization program (Erasmus, 2019), greater participation in traditional physical activities and consumption of traditional foods (Hilgendorf et al., 2019; Janssen et al., 2014; Lévesque et al., 2015; Redwood et al., 2008), and higher self-efficacy in healthy food preparation (Mercille et al., 2012). Four studies report on higher overall resilience to threats to health and wellbeing (Liebenberg et al., 2015; Pearce et al., 2015; Phillips, 2010; Thunderbird Partnership Foundation & Health Canada, 2015). Both of the final two studies in this category analyze data from a 1993 survey with Hopi women and report associations between language use, likelihood of practicing traditional behaviors to keep healthy (Coe et al., 2004), and participation in routine breast cancer screening (Giuliano et al., 1998).

Eleven studies report supportive effects on physical health related to language use. Six of these studies focus on physical health, sickness, and illness in a general, non-specific sense (Bach, 2016; Basso, 1990; Brown et al., 2012; Fitzgerald, 2017; Hilgendorf et al., 2019; Running Bear et al., 2018). Four focus on specific illnesses and diseases—three on diabetes prevalence (Oster et al., 2014), progression (Teng et al., 2019), and related hospitalizations (King et al., 2018), and one on asthma rates (Cunningham, 2010). The final study reports benefits to childhood oral health (Ball et al., 2013).

The literature unequivocally supports the positive effects of linguistic vitality on spiritual wellbeing in the nine studies that assess it, as

encapsulated in the following quotes:

“What must be remembered is that language is not simply a tool for everyday communication, but through recording of stories, songs, legends, poetry and lore, holds the key to a people’s history and opens the door to cultural and spiritual understanding.” (Wilson, 1997, p. 259)

“There are many spiritual and cultural precepts Hawaiians once knew and are rediscovering through the reemergence of the Hawaiian language.” (Bach, 2016, p. 82)

“Our journey into the healing potential of language is an inexorable course through spirituality.” (Iwama et al., 2009, p. 8)

Four studies report links between linguistic vitality and safer, less frequent substance use. Brass (2013) reports that Aboriginal respondents who used their language at home were less likely to consume more than four alcoholic drinks per day when compared to people who didn’t use their language at home. Healey and Meadows report that the emotional pain of language loss can lead people to “tur[n] to addictive substances to cope” (Healey & Meadows, 2008, p. 30), a finding also echoed in a publication by Health Canada (Thunderbird Partnership Foundation, & Health Canada, 2015). An excerpt from a consultation by Taff and colleagues provides an account of a language learner’s path to sobriety:

“[...] I was at a ceremony to do with language where we were taught that alcohol does not serve. I made a commitment for four years to not drink because I wanted to be a good language learner. I wanted to be able to look at my elder and speak to him and not feel ashamed of myself. I’m thirty-three now and I haven’t drunk since I was twenty.” (Taff et al., 2018, p.866)

3.5. Non-significant results in original research

14 studies report statistically non-significant results from the analyses which they conducted on the links between languages and health. All these studies were observational, involving the administration of surveys and quantitative analyses. The six studies in the mental, cognitive, and psychological health and development category focus on mood (Beckstein, 2015; Davis, 2012), cognitive development (Cummings, 1998; Goyal et al., 2018), history of diagnosis of an anxiety disorder (Nasreen et al., 2018), overall mental health as measured by a range of component factors and a history of having considered suicide (Guevremont et al., 2016). Four studies look at health protective or risk factors and behaviors, specifically cancer screening rates and knowledge (Gonzales et al., 2012), high-risk sexual behavior (Myers et al., 1999), survival sex work (Sharma et al., 2020), and healthy movement patterns, measured as leisure-time physical activity and walking as a means of active transportation (Ryan et al., 2018). The studies on physical health and sickness focus on the prevalence of morbid obesity (Hodge et al., 2011) and history of hysterectomy (Zhang et al., 2005). One study examines correlations to rates of heavy drinking (Ryan, Cooke, et al., 2016), and one looks at self-rated health (Eliassen et al., 2012).

3.6. Adverse links in original research

11 studies report adverse links between measures of language and health, all of which use quantitative epidemiological methods to analyze decontextualized national survey data.

Four of the studies report links to health risk factors and behaviors. Two of these report links between use of an Indigenous language at home and a lower likelihood of lifetime participation in screening tests for colorectal and breast cancers (Perdue et al., 2011; Tapia et al., 2019). Redwood et al. (2012) report that participants who spoke an Alaska Native or American Indian language at home were more likely to be exposed to occupational and environmental hazards such as to asbestos and pesticides. And Temple and Russell (2018) report that older

Aboriginal and Torres Strait Islander people who speak their Indigenous language were more likely to experience food insecurity, particularly those who live in remote areas.

All four studies within the substance use behaviors and addictions category are analyses of data from the 2006 and 2012 Aboriginal Peoples Surveys in Canada and report associations between Aboriginal language use and smoking rates among youth and adults (Ryan et al., 2015, 2017; Ryan, Leatherdale, et al., 2016; Van Bever & Woodgate, 2017). Three of the four studies are from the same research team.

Two studies report adverse links to measures of overall health, wellness, resilience, and healing, and both are based on analyses of Australian national survey data on Aboriginal and Torres Strait Islander peoples. The first focuses on five-year-old children in the Northern Territory and reports a higher likelihood of being assessed as developmentally vulnerable if they spoke English as a second language compared to English as a first language, independent of other perinatal and socio-demographic factors (Guthridge et al., 2016). The second study identifies an association between not speaking English as a primary language at home and self-reporting fair or poor health when compared to people who primarily spoke English at home, even after accounting for other factors (Sibthorpe et al., 2001).

The final study is in the category of physical health and sickness and reports that COVID-19 rates were lower in Oklahoma reservations with higher percentages of English language-only households (Rodriguez-Lonebear et al., 2020).

3.7. Neutral links in original research

Three studies report links to health-related behaviors which we have categorized as neutral, as the authors of the respective studies did not explicitly specify whether these behaviors support or adversely impact health outcomes, i.e., they took a neutral approach to the subject. Two of these studies report links between Indigenous language use and the likelihood of accessing and believing in the efficacy of traditional Indigenous medicine healers (Henderson, 2009; Waldram, 1990a), while the third reports a link between speaking an Indigenous language at home and the likelihood of using smokeless tobacco products as compared to cigarettes or cigars (Redwood et al., 2010). The studies in this category applied quantitative analytic methods to retrospective national survey data (Henderson, 2009), to a large-scale health survey (Redwood et al., 2010), and to interviews (Waldram, 1990a).

3.8. Mixed findings in original research

22 studies report some combination of supportive, adverse, non-significant and/or neutral links between language and health. Eight of the mixed studies focus on health risk and protective factors, seven on physical health, six on mental or cognitive health, two on substance use, one on spiritual wellbeing, and one on overall health.

Twelve of these studies report a mix of findings across the multiple aspects of language and/or health which they assessed. For example, Dockery (2011) reports a supportive link between speaking an Aboriginal or Torres Strait Islander language and lower rates of alcohol use, but mixed links to various measures of mental health. Jenni et al. (2017) report that participation in a language learning program supported the students’ overall wellbeing, substance use dependency recovery, and spiritual wellbeing, but that this same participation had a mixed effect on physical health as some learners experienced exhaustion and fatigue.

Nine of the mixed results studies report on links that differ by gender, geographical location, and/or the ages of participants. For example, Cooke et al. (2013) report associations between Indigenous language knowledge and obesity among Métis boys aged 6–10 and girls aged 11–14 in Canada, but not among girls aged 6–10 or boys aged 11–14. Two studies from each Australia and Canada report that the positive psychological effects of Indigenous language fluency were only significant for populations in their sample who lived in rural and remote areas

(Dockery, 2011; Hossain & Lamb, 2019). The author of the Australian study hypothesized that their finding reflected the stress of “coexistence within both a traditional, minority culture and a mainstream culture” for Indigenous language speakers living in non-remote areas (Dockery, 2011, p. 19), while the authors of the Canadian study suggested that other unmeasured variables which influence wellbeing may explain their finding (Hossain & Lamb, 2019).

Two studies report different links to health depending on whether the population is bilingual or mainly/exclusively speaks their Indigenous language. We coded these studies in the mixed category since the interpretation of these findings in the context of our research question is not straightforward. Duncan et al. (2014) report higher levels of physical activity among the bilingual speakers in their Northern Plains American Indian sample compared to those who exclusively spoke their Indigenous language. Meanwhile, Zienczuk and Egeland (2012) report that the proportion of adults who were overweight or obese was higher among the populations who either spoke only English or both an Inuit language and English at home compared to those who primarily spoke an Inuit language. Given that Zienczuk and Egeland report a gradient where odds of an at-risk body mass index increases if both an Inuit language and English are spoken at home and increases further if only English is spoken at home, the frequency of use of English as an additional variable complicates the interpretation of this study in the context of understanding the direction of links between Indigenous language use and physical health.

3.9. Links between languages and health in literature reviews

Of the 42 studies which review previous literature, 41 report only supportive links between languages and health (Table 2). The only exception is a literature review that takes a neutral approach—Waldram (1990b) reports a link between speaking an Indigenous language and seeking the services of a traditional Indigenous healer and/or believing in the superiority of traditional medicines for some medical problems. The author does not specify or speculate on how these beliefs and behaviors may be associated with health or wellness outcomes.

Mental, cognitive, and psychological health are the primary focus of the literature reviews (n = 22), followed by health care, assessment, access, education, and promotion (n = 17):

“A refusal to take Aboriginal languages seriously not only results directly in less than optimal medical outcomes, but also in mistrust and disengagement with the health sector and non-compliance with treatment regimens.” (Amery, 2017, p. 15)

Overall health and wellness is an equally large category (n = 17), as is described in an Australian social justice report:

“Where languages are eroded and lost, so too is the cultural knowledge. This in turn has potential to impact on the health and well-being of Indigenous peoples.” (Aboriginal and Torres Strait Islander Social Justice Commissioner, 2009, p. 58)

Table 2

Links between languages and health in literature reviews. Tabulation of the conclusions of literature review studies on direction of link between languages and health (n = 42).

Direction of link	Aspects of health
Supportive (n = 41)	Mental, cognitive, and psychological health and development (n = 22) Health care, assessment, access, education, and promotion (n = 17) Overall health, wellness, resilience, and healing (n = 17) Health protective or risk factors and behaviors (n = 9) Physical health and sickness (n = 9) Spiritual wellbeing (n = 4) Substance use behaviors and addictions (n = 3)
Neutral (n = 1)	Accessing a traditional healer (n = 1)

The remaining aspects of health supportively linked to language in the literature reviews are health protective and risk factors (n = 9), physical health (n = 9), spirituality (n = 4) and safe substance use (n = 3). Exemplifying and summarizing the strong trend towards supportive links is this quote from an Australian report:

“It is abundantly clear that our cultural health and wellbeing rests on the linkages we have and maintain with mother tongue and mother culture, and it is abundantly clear that when these linkages are threatened our anguish over loss causes an intensification of the holistic lifelong learning process which then cycles round and causes serious ill-health. On this basis alone I say to myself—do we really need further evidence to demonstrate that there is a direct causal link between a healthy mother tongue and mother culture and a healthy community? If our children are dying through lack of culture or too much culture all at once, we surely must see that something is dreadfully wrong.” (Williams, 2011, p. 64)

4. Discussion

In this scoping review of 262 studies about the links between linguistic vitality and the health and wellness of Indigenous peoples in Anglo settler-colonial societies, our research team collated and assessed a diverse body of academic and gray literature. Through our research, it became apparent that while a limited set of studies tend to be cited on this topic, it is a well-researched field in which a wide variety of measures of language, health, and community contexts have been examined using a diverse range of research methods.

A majority of the studies that were selected for inclusion in our scoping review reported supportive links between languages and health throughout the lifespan. The use, proficiency, fluency, maintenance, vitality, learning, revitalization, and reclamation of Indigenous languages tended to be positively associated with health and wellness. Meanwhile, the diminishment, denigration and destruction of Indigenous languages were associated with worse health and wellness.

The pervasiveness and urgency of cases in which there was a documented lack of access to linguistically appropriate health care was a highly prevalent theme. Alongside this were studies demonstrating how providing health care and education in Indigenous languages, rather than English, can improve the likelihood of positive health and care outcomes. As a key issue in health ethics arising from this study, language is highly relevant both for the commitment that health professionals have to provide culturally appropriate, safe, and effective health care (Curtis et al., 2019; Miles, 2004) and for public health programs to enact justice and respect for all persons (Public Health Agency of Canada, 2021). The large number of studies focusing on the need for linguistically appropriate care for people with conditions affecting the mind and brain has implications for neuroethics, where recent research has highlighted the limitations of reductionist approaches to neurology and psychiatry and the need to meaningfully incorporate Indigenous ways of knowing and being into research and care (Harding, 2022; Illes et al., 2025). These findings also add evidence that language oppression is necropolitical, i.e., that “language oppression kills,” (Roche, 2022, p. 34), and highlight the centrality of language revitalization in Indigenous resurgence (Simpson, 2017).

A comparatively small portion of the 262 studies reported adverse links between linguistic vitality and health. None of the included literature reviews identified any adverse links. However, the 2022 realist review on Indigenous languages and health which we introduced in Section 3.1 above reported that 31 of their 180 included studies suggest negative impacts on health (Whalen et al., 2022). Data from the studies that report mixed findings can add further nuance to understanding the conflicting findings between studies that report only supportive and those that report only adverse links. For example, language could have a variable health effect depending on rural or urban residence, English fluency, age, and gender.

Regarding the specific studies in our sample that reported adverse

links, there are some limitations to using many of these studies to advance an understanding of potential adverse links. The authors of most of these articles noted concerns around confounding variables and potentially irrelevant measures of health more frequently than did the authors of the studies reporting supportive links. Specifically, six of the eleven studies that reported adverse links examined aspects of health that are known to be correlated with socioeconomic status and structural barriers: smoking, exposure to occupational and environmental hazards, and food insecurity (Hiscock et al., 2012; Moses et al., 1993; Shafiee et al., 2022).

The authors of the two studies that report links between Indigenous language use and lower cancer screening participation speculate on possible confounders, suggesting that the results may reflect an avoidance of the medical system based on experiences of systemic racism (Perdue et al., 2011) or that “language itself is not the risk factor, but rather a marker for access to services” (Schumacher et al., 2008, p. 735). Sibthorpe and colleagues (2001) postulate that the global self-assessed health question on the population-level survey they analyzed was not culturally valid because the finding of lower overall health among Indigenous language speakers was not consistent with mortality or morbidity data.

Another consideration surrounding the utility of some data in our sample arises when considering the subset of studies which used quantitative, epidemiological methods to analyze decontextualized national survey data. As we have noted, all the studies that reported only adverse links between language and health assumed this same methodological approach. In an editorial written in response to one of the studies in our sample that reported a correlation between smoking and language use (Ryan et al., 2015), King (2015) makes the point that the research design of the study lacked community contextualization or validation. King recommends that even though secondary analyses of de-identified data do not require ethics board review, they should follow the same ethical criteria as primary research in Canada of “engag[ing] experts with the requisite contextual knowledge—Métis community knowledge holders, in this case—to guide the data interpretation” (King, 2015, p. e456).

A related epistemological consideration arose from the wide range of measures of health and wellbeing reported in the publications screened for inclusion, and the challenges of defining eligibility criteria that were both inclusive and could meet the public health policy advocacy objectives of this review. The English term “health” can be restrictive, and government measures such as attendance rates to cancer screening programs or prevalence of tobacco use can lack relevance in some contexts (Boddington & Raisanen, 2009). Two-Eyed Seeing is a useful concept for approaching these differences, as articulated by Mi’kmaq Elder Albert Marshall, who authored one of the studies included in this review (Iwama et al., 2009):

“[...] the gift of multiple perspectives [...] learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing, and [...] using both these eyes together, for the benefit of all,” (Bartlett et al., 2012, p. 355)

The uneven distribution of publications across the four countries studied may indicate the need for more resourcing of and focus on Indigenous language and health research and policy work in the USA, and might imply that Australia and Canada are current leaders in this field. However, the challenge we noted around how Pacific Islanders are grouped together with other Indigenous and non-Indigenous populations in research and census data may also have contributed to the underrepresentation of communities in the USA.

To provide a brief comment on the publications since our scoping review cut-off date in 2021, we ran our search again in MEDLINE (Ovid) on June 21, 2024. We limited the results to those with language*, linguistic*, revitali*, or recla* in the title, which yielded 135 results. LH reviewed each title and abstract and noted two relevant articles, including the 2022 realist review by Whalen and colleagues which we

have already commented on here (Whalen et al., 2022). The other article reports on data from a community-based participatory research project involving the administration of surveys to 191 Anishnaabe adults (Gonzalez et al., 2021). Quantitative analyses suggested that spiritual connectedness through prayer is a mediator of the relationship between Indigenous language use in the home and positive mental health (Gonzalez et al., 2021).

The strengths of our current study include comprehensiveness, analytical rigor, and multidisciplinary. Making use of a large number of databases spanning different academic disciplines and including gray literature allowed us to have a broad scope and reduce selection bias. The use of a scoping review methodology that follows many of the established best practice guidelines—including the pre-registration of a research protocol—affords scientific rigor, replicability, and transparency to the work. An extensive analytical supplement was prepared with summaries of each study to contextualize findings and support further research and exploration of the study data (Supplementary Material Table S1). And finally, the multidisciplinary composition of our research group has helped strengthen our process, engage with Indigenous understandings, and contextualize our findings.

4.1. Limitations

There are several limitations of our application of the scoping review method. First, given that a scoping review highlights commonalities and generalizations, the ability to provide in-depth analyses of content that speaks to the specificity of Indigenous communities, languages, and health conditions is necessarily constrained and somewhat limited. Throughout our review, we have highlighted the cultural nuances and specificities of different Indigenous communities where possible, in particular through offering citations and examples of relevant research. In addition, many of our findings are quite broad, and this scoping review does not afford us the position of attending to how they will play out on the ground. Second, while we went to considerable lengths to include all relevant publications, the underreporting of negative or inconclusive findings in academic studies remains a known source of publication bias affecting literature reviews (Mlinarić et al., 2017). Third, only one researcher charted the data due to our resource and funding limitations.

The studies we captured were limited by the definitions of languages and health that we formulated. Our decision to focus on Anglo settler colonial contexts, and therefore only papers written in English, was also on our team’s capacity and resources, and the dominance of English in scholarly publishing. Further explorations that evaluate French, Spanish, and other colonial contexts (and languages) will surely increase the sample size of literature and extend the diversity of our understandings of the links between Indigenous languages and health.

The search terms we used for Indigenous communities were limited to established umbrella terms such as Indigenous, Aboriginal, First Nations, etc., because there was a shortage of available resources that offered greater specificity at the time of conducting the search (Harding et al., 2021). This limitation has since been addressed for future literature reviews through the expansion of a set of search templates first created by the University of Alberta Library in 2021 which provide highly specific search terms pertaining to communities in all four countries (University of Alberta Library, 2025).

New and relevant studies have been published since we conducted our search in early 2021, including but not limited to the two which appeared in our 2024 abbreviated search of MEDLINE. Therefore, we are limited in our ability to comment on new data since 2021.

There are also limitations to the analytic techniques we applied. While the content analysis we conducted was relatively straightforward with minimal interpretation required, there is always potential for unconscious bias to impact findings. Our beliefs, for example, in the value of linguistic vitality and our positions within generally liberal academic institutions could bias findings towards supportive links between

languages and health (Chambers et al., 2018). Finally, the vote-counting method offers only a crude estimate of the existence of a link between languages and health and captures only statistically significant results (Bushman & Wang, 2009).

5. Conclusions and Recommendations

The above limitations and constraints aside, the results of this scoping review suggest that language is a determinant of Indigenous peoples' health in Anglo settler nations. Actions should be prioritized which ensure that the healing effects of language can be harnessed, and that the significant and measurable human costs of linguistic oppression are understood and redressed. We conclude our contribution with four recommendations relating to future research, community-based language revitalization work, health care, and post-secondary curricula (Table 3).

The next step for research on the health benefits of Indigenous languages would benefit from a focus on specificity, delving deeper into the various nuances, confounders, mediators, and other critical factors which arise in different contexts to influence this relationship. For example, it would likely be productive to explore more specifically how Indigenous language use can lead to improved health and wellbeing, conduct longitudinal studies to examine causal relationships, investigate the impacts of language revitalization interventions on health in different community settings, and query for differences between the findings exposed in academic and gray literature.⁶ The references and summaries provided in the Supplementary Material Table S1 can be leveraged to support this. A systematic review with targeted, community-developed research questions and culturally appropriate critical appraisal tools (Harfield et al., 2020) may be another productive direction worth targeting. However, all such research questions run the risk of over-intellectualizing a human experience through a Western scientific lens, particularly given that this review has revealed that most studies engaging deeply with communities have already identified supportive links and the presence of multiple holistic factors. Guidance from King (2015), Williams (2011), Puebla (2014) and others helps to remind researchers that it is necessary to critically appraise the context and meaningfulness of any study findings which deviate from communities' own understandings. Indigenous leadership combined with sustained, reciprocal community engagement following ethical research principles using meaningful methods will be critical to ensuring the

Table 3
Summary of recommendations. Summary of recommendations based on the scoping review results.

Recommendation	Responsible Parties
Create funding calls for community-engaged, Indigenous-led, contextually specific research aiming to maximize and support the health benefits of languages.	Federal and regional research institutes for health and languages, and organizations with special interest in Indigenous languages and health.
Provide sustainable, long-term funding for programs that support linguistic vitality within Indigenous communities.	Federal and regional governments, and other organizations with special interest in Indigenous languages and health.
Ensure that health care and promotion are linguistically appropriate and accessible to all, irrespective of linguistic background.	Health care services administrators and health care bodies.
Develop courses and appropriate pedagogy on the links between linguistic vitality and health.	Post-secondary institutions.

⁶ We gratefully acknowledge comments that we received from the anonymous peer reviewers for some of these suggestions.

relevance, actionability, specificity, and ethics of any further research in this productive domain (Hayward et al., 2021; Kovach, 2021; Smith, 2021; Thurber et al., 2020).

Targeted funding, which could be administered by federal institutes for health research and/or Indigenous languages, or resources at the state/province level, would advance the research. An example of a collaborative and systematic research project which received government funding is the ongoing study by Sivak and colleagues with the Barnagarla community in Australia into the links between community-based language reclamation and mental health and wellbeing (Sivak et al., 2019).

By identifying, collating, and analyzing the wealth of existing evidence in this area, our goal for this scoping review is that it be harnessed in service of a more robust, consistent, and tangible response to Indigenous communities' calls for sustainable funding for initiatives which seek to maintain, reclaim, and/or revitalize their languages and support language learners. Language work is vital to the holistic wellness of communities, and forcing community language workers to repeatedly apply for piecemeal, unpredictable, and short-term funding with no promise of long-term, multi-year support is neither effective, appropriate nor ethical. Given the silos in which central government research funding streams tend to operate and the inherently interdisciplinary nature of the interaction between health and language, it may be far more cost-effective and prudent to allocate some strategic funds from health budgets towards supporting linguistic vitality to augment other existing funding sources.

The health field and health workers must act to better incorporate diverse languages into health and healing initiatives, and to ensure that all health care is linguistically appropriate and that language barriers are reduced. Special priority should be put towards ensuring that Indigenous patients' linguistic needs are met, and that no patient experiences poor health care on account of a lack of professional interpreting support (Jaeger et al., 2019). The focus on language in health should continue to be linked closely with newer and positive developments in culturally safe care, culture as medicine, and land-based healing.

Our study findings are also actionable in a broader societal context as part of a wider movement that works towards Indigenous language and culture revitalization in a manner that is focused on renewed relationships with Indigenous peoples. Understanding that Indigenous languages are integral to the holistic wellbeing of a community and not just a practical tool of communication which can be replaced without consequence by English, French or Spanish is part of respecting and valuing the knowledge traditions of Indigenous peoples and their cultures. This understanding is shared by many non-Indigenous minority language communities as well, and as such can be a place for allyship and collaborative action. The references collated in this review provide sufficient content for a full post-secondary course on understanding the links between Indigenous linguistic vitality and health, which could be productively developed and delivered by a department of Indigenous languages, Indigenous studies, public health, or incorporated into existing courses in a number of disciplines.

In conclusion, it is time for the diverse links between Indigenous linguistic vitality, health, and wellness to be taken seriously by professionals and policy makers, and for this understanding to be enacted through tangible support for Indigenous communities. As we progress through the United Nations Decade of Indigenous Languages, we are better positioned than ever to be part of this positive transformation.

Funding

This research was supported in part by a University of British Columbia Language Sciences Grant for Catalyzing Research Clusters (MT and Dr. July Illes). LH held funding from a Canadian Institutes of Health Research Canada Graduate Scholarship Master's Award (#6556) and a W. Maurice Young Centre for Applied Ethics Graduate Fellowship.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

CRedit authorship contribution statement

Harding Louise: Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Conceptualization. **DeCaire Ryan:** Writing – review & editing, Methodology, Conceptualization. **Ellis Ursula:** Writing – review & editing, Methodology. **Delaurier-Lyle Karl:** Writing – review & editing, Methodology. **Schillo Julia:** Writing – review & editing, Investigation. **Turin Mark:** Writing – original draft, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Mark Turin reports financial support was provided by University of British Columbia Language Sciences Institute. Louise Harding reports financial support was provided by Canadian Institutes of Health Research. Louise Harding reports financial support was provided by The University of British Columbia W Maurice Young Centre for Applied Ethics. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We acknowledge Judy Illes, Sarah Dupont, and other colleagues and students who supported and enabled various stages of this project. We thank the anonymous peer reviewers for their constructive and helpful feedback. The University of British Columbia Point Grey campus where many of the authors work is located on the traditional, ancestral, and unceded homelands of the hən̓q̓əmi̓n̓əm-speaking xʷməθkʷəy̓əm (Musqueam) people.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.laheal.2025.100047.

Data availability

Data will be made available on request.

References

- Aboriginal and Torres Strait Islander Social Justice Commissioner. (2009). *Social justice report* [Report]. Australian Human Rights Commission. (<https://humanrights.gov.au/our-work/chapter-3-introduction-social-justice-report-2009>).
- Aboriginal Languages Act, 51, New South Wales (2017). (<https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-2017-051>).
- Amery, R. (2017). Recognising the communication gap in Indigenous health care. *Medical Journal of Australia*, 207(1), 13–15. <https://doi.org/10.5694/mja17.00042>
- Angelo, D., O'Shannessy, C., Simpson, J., Kral, I., Smith, H., & Browne, E. (2019). Well-being & indigenous language ecologies (WILE): A strengths-based approach. Australian National University: ARC Centre of Excellence for the Dynamics of Language. https://openresearch-repository.anu.edu.au/bitstream/1885/186414/2/NILR%20LitReview_FINAL_29July2020_c.pdf.
- Arturo, S., Cargo, M., Brown, A., & Daniel, M. (2013). Factors influencing health care utilisation among Aboriginal cardiac patients in central Australia: A qualitative study. *BMC Health Services Research*, 13, 83. <https://doi.org/10.1186/1472-6963-13-83>
- Australian Bureau of Statistics. (2022). Census of population and housing—Counts of Aboriginal and Torres Strait Islander Australians, 2021. Australian Bureau of Statistics. (<https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/census-population-and-housing-counts-aboriginal-and-torres-strait-islander-australians/latest-release>).
- Australian Bureau of Statistics. (n.d.). Aboriginal and Torres Strait Islander surveys. Australian Bureau of Statistics. (<https://www.abs.gov.au/about/aboriginal-and-torres-strait-islander-peoples/aboriginal-and-torres-strait-islander-surveys>).
- Australian Government. (2020). Closing the gap. (<https://www.niaa.gov.au/sites/default/files/reports/closing-the-gap-2020/sites/default/files/pdf/closing-the-gap-report-2020.pdf>).
- Bach, D. (2016). What matters to the heart: Hawaiian belief and value systems relating to disease and spirituality [PhD Dissertation, Saybrook University]. (<https://www.proquest.com/dissertations-theses/what-matters-heart-hawaiian-belief-value-systems/docview/1707929019/se-2>).
- Ball, J. (2006). Talking points: Exploring needs and concepts for Aboriginal early childhood language facilitation and supports [Concept discussion paper]. Aboriginal Head Start in Urban and Northern Communities, Public Health Agency of Canada. (<https://canadacommons.ca/artifacts/1183603/talking-points/1736732/#details=1>).
- Ball, J., & Lewis, M. (2014). First Nations Elders' and parents' views on supporting their children's language development. *Canadian Journal of Speech-Language Pathology and Audiology*, 38(2), 224–237.
- Ball, J., Moselle, K., & Moselle, S. (2013). Contributions of culture and language in Aboriginal Head Start in urban and northern communities to children's health outcomes: A review of theory and research. Division of Children, Seniors & Healthy Development, Health Promotion and Chronic Disease Prevention Branch, Public Health Agency of Canada. (<https://ecdip.org/wp-content/uploads/2022/01/Language-Culture-Child-Health-Theory-Research-Ball-Moselle-Moselle.pdf>).
- Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331–340. <https://doi.org/10.1007/s13412-012-0086-8>
- Basso, K. H. (1990). "Speaking with names": Language and landscape among the Western Apache. *Western Apache language and culture: Essays in linguistic anthropology* (pp. 138–182). U Arizona Press.
- Beckstein, A. (2015). The relationship between decision-making style and self-construal and the subjective happiness of Native Americans [PhD Dissertation, Arizona State University]. (<https://keep.lib.asu.edu/items/154109>).
- Bird, S. M., Wiles, J. L., Okalik, L., Kilabuk, J., & Egeland, G. M. (2008). Living with diabetes on Baffin Island: Inuit storytellers share their experiences. *Canadian Journal of Public Health*, 99(1), 17–21.
- Boddington, P., & Raisanen, U. (2009). Theoretical and practical issues in the definition of health: Insights from Aboriginal Australia. *The Journal of Medicine and Philosophy*, 34(1), 49–67. <https://doi.org/10.1093/jmp/jhn035>
- Brass, E.R. (2013). Restoring balance: Determinants of health and depressive symptoms in Aboriginal people [PhD Thesis, University of Regina]. (<http://hdl.handle.net/10294/14291>).
- Brougham, D., & Haar, J. M. (2013). Collectivism, cultural identity and employee mental health: A study of New Zealand Māori. *Social Indicators Research*, 114(3), 1143–1160. <https://doi.org/10.1007/s11205-012-0194-6>
- Brown, D. L. (2016). Daughters of the drum: Decolonizing health and wellness with Native American women. *AlterNative: An International Journal of Indigenous Peoples*, 12(2). <https://doi.org/10.20507/AlterNative.2016.12.2.1>
- Brown, H. J., McPherson, G., Peterson, R., Newman, V., & Cranmer, B. (2012). Our land, our language: Connecting dispossession and health equity in an indigenous context. *CJNR: Canadian Journal of Nursing Research*, 44(2), 44–63.
- Bushman, B. J., & Wang, M. C. (2009). Vote-counting procedures in meta-analysis. In H. Cooper, Larry V. Hedges, & J. C. Valentine (Eds.), *The Handbook of Research Synthesis and Meta-Analysis*. Russell Sage Foundation. <https://doi.org/10.7758/9781610441384.15>.
- Canadian Council of Provincial Child and Youth Advocates. (2010). Aboriginal children & youth in Canada: Canada must do better. (http://www.cccya.ca/images/english/pdf/aboriginal_children_youth_advocates_position_paper_2010.pdf).
- Carpenter, J., Chase, B., Chung, B., Humchitt, R., & Turin, M. (2021). Mobilizing and activating Haizraqvl'a (Heiltsuk language) and culture through a community-university partnership. 5(1). (<https://doi.org/10.18357/kula.127>).
- Carpenter, K., & Tsykarev, A. (2020). Indigenous language as a human right symposium: Critical perspectives on race and human rights: Transnational re-imaginings. *UCLA Journal of International Law and Foreign Affairs*, 24(1), 49–132.
- Chambers, L. A., Jackson, R., Worthington, C., Wilson, C. L., Tharao, W., Greenspan, N. R., Masching, R., Pierre-Pierre, V., Mbulaheni, T., Amirault, M., & Brownlee, P. (2018). Decolonizing scoping review methodologies for literature with, for, and by Indigenous peoples and the African diaspora: Dialoguing with the tensions. *Qualitative Health Research*, 28(2), 175–188. <https://doi.org/10.1177/1049732317743237>
- Cheng, W. Y. C., Blum, P., & Spain, B. (2004). Barriers to effective perioperative communication in indigenous Australians: An audit of progress since 1996. *Anaesthesia and Intensive Care*, 32(4), 542–547.
- Coe, K., Attakai, A., Papenfuss, M., Giuliano, A., Martin, L., & Nuvayestewa, L. (2004). Traditionalism and its relationship to disease risk and protective behaviors of women living on the Hopi reservation. *Health Care for Women International*, 25(5), 391–410. <https://doi.org/10.1080/07399330490438314>
- Cohen, B. (2001). The spider's web: Creativity and survival in dynamic balance. *Canadian Journal of Native Education*, 25(2), 140–148.
- Cooke, M. J., Wilk, P., Paul, K. W., & Gonneville, S. L. H. (2013). Predictors of obesity among Metis children: Socio-economic, behavioural and cultural factors. *Canadian Journal of Public Health/Revue Canadienne Delelitt Sante Publique*, 104(4), e298–e303.
- Coulthard, G. S. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. University of Minnesota Press. (<https://muse.jhu.edu/pub/23/monograph/book/35470>).

- Counciller, A.G. L. (2011). Niugnelyukut (we are making new words): A community philosophy of language revitalization [PhD thesis, University of Alaska Fairbanks]. (<http://hdl.handle.net/11122/9049>).
- Cummings, M.A. (1998). Acculturation, family variables, and cognition of a subgroup of American Indian children ages 3-9 [PhD dissertation, Utah State University]. (<https://www.proquest.com/docview/304381167?pq-origsite=scholar&fromopenview=true>).
- Cunningham, J. (2010). Socioeconomic status and self-reported asthma in Indigenous and non-Indigenous Australian adults aged 18-64 years: Analysis of national survey data. *International Journal for Equity in Health*, 9(18). <https://doi.org/10.1186/1475-9276-9-18>
- Cunningham, J., & Paradies, Y. C. (2012). Socio-demographic factors and psychological distress in Indigenous and non-Indigenous Australian adults aged 18-64 years: Analysis of national survey data. *BMC Public Health*, 12(95). <https://doi.org/10.1186/1471-2458-12-95>
- Curtis, E., Jones, R., Tipene-Leach, D., Walker, C., Loring, B., Paine, S.-J., & Reid, P. (2019). Why cultural safety rather than cultural competency is required to achieve health equity: A literature review and recommended definition. *International Journal for Equity in Health*, 18(1), 174. <https://doi.org/10.1186/s12939-019-1082-3>
- Davis, B. (2012). Cultural connectedness as personal wellness in First Nations youth (403) [Master's thesis, University of Western Ontario]. Electronic Thesis and Dissertation Repository. (<https://ir.lib.uwo.ca/etd/403>).
- Davis, L. (2017). Addressing Indigenous language loss by unsettling the racialized linguistic hierarchies entrenched in Canada's language policies. *Working Papers of the Linguistics Circle of the University of Victoria*, 27(1), 52-78.
- Davis, J. L. (2018). *Talking Indian: Identity and language revitalization in the Chickasaw renaissance*. The University of Arizona Press.
- Dockery, A. M. (2011). Traditional culture and the wellbeing of Indigenous Australians: An analysis of the 2008 NATSISS [CLMR Discussion paper]. *Centre for Labour Market Research*. Perth: Curtin University.
- Duncan, G. E., McDougall, C. L., Dansie, E., Garrouette, E., Buchwald, D., & Henderson, J. A. (2014). Association of American Indian cultural identity with physical activity. *Ethnicity Disease*, 24(1), 1-7.
- Eckhart, S. E. (1983). *The relationship between language proficiency and cognitive ability for Navajo students enrolled in two types of instructional programs [Doctoral dissertation]*. Northern Arizona University.
- Eliassen, B.-M., Braaten, T., Melhus, M., Hansen, K. L., & Broderstad, A. R. (2012). Acculturation and self-rated health among Arctic indigenous peoples: A population-based cross-sectional study. *BMC Public Health*, 12, 948. <https://doi.org/10.1186/1471-2458-12-948>
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107-115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- Employment and Social Development Canada. (2018). Social isolation of seniors—Supplement to the social isolation and social innovation toolkit: A focus on indigenous seniors in Canada [Toolkit]. Employment and Social Development Canada. (<https://www.canada.ca/en/employment-social-development/corporate/seniors/forum/social-isolation-indigenous.html>).
- England Aytes, K. (2015). Memories hold hands: Perceptions of historical trauma and associated behavioral and emotional responses among four generations of American Indian (Cherokee) descendants [Doctoral dissertation]. Fielding Graduate University.
- Erasmus, M.T. (2019). Goyati K'aat'ii Ats'edee, K'aat'ii Adets'edee: Ho! / Healing our languages, healing ourselves: Now is the time [Master's thesis, University of Victoria]. (<http://hdl.handle.net/1828/10855>).
- First Peoples' Cultural Council. (2018). Report on the status of B.C. First Nations languages.
- Fitzgerald, C. M. (2017). Understanding language vitality and reclamation as resilience: A framework for language endangerment and "loss" (commentary on Mufwene). *Language*, 93(4), e280-e297. <https://doi.org/10.1353/lan.2017.0072>
- Gerlach, A. (2018). Exploring socially-responsive approaches to children's rehabilitation with Indigenous communities, families and children. *National Collaborating Centre for Aboriginal Health*. (<https://www.deslibris.ca/ID/10096166#details=1>).
- Giuliano, A., Papenfuss, M., de Zapien, J. D., Tilousi, S., & Nuvayestewa, L. (1998). Breast cancer screening among Southwest American Indian women living on-reservation. *Preventive Medicine*, 27(1), 135-143.
- Godin, K., Stapleton, J., Kirkpatrick, S. I., Hanning, R. M., & Leatherdale, S. T. (2015). Applying systematic review search methods to the grey literature: A case study examining guidelines for school-based breakfast programs in Canada. *Systematic Reviews*, 4(1), 138. <https://doi.org/10.1186/s13643-015-0125-0>
- Gonzales, A. A., Garrouette, E., Ton, T. G. N., Goldberg, J., & Buchwald, D. (2012). Effect of tribal language use on colorectal cancer screening among American Indians. *Journal of Immigrant and Minority Health*, 14(6), 975-982. <https://doi.org/10.1007/s10903-012-9598-2>
- Gonzalez, M. B., Kelley J. S., Ullrich, Jessica, & Walls, Melissa L. (2021). Spiritual connectedness through prayer as a mediator of the relationship between Indigenous language use and positive mental health. *Cultural Diversity Ethnic Minority Psychology*, 27(4), 746-757. <https://doi.org/10.1037/cdp0000466>
- Goyal, S., Temple, V., Sawanas, C., & Brown, D. (2018). Cognitive profile of adults with intellectual disabilities from indigenous communities in Ontario, Canada. *Journal of Intellectual and Developmental Disability*. <https://doi.org/10.3109/13668250.2018.1470160>
- Guevremont, A., Arim, R., & Kohen, D. (2016). The relationships between school experiences and mental health outcomes among off-reserve first nations youth. *Aboriginal Policy Studies*, 5(2). <https://doi.org/10.5663/aps.v5i2.24703>
- Guthridge, S., Li, L., Silburn, S., Li, S. Q., McKenzie, J., & Lynch, J. (2016). Early influences on developmental outcomes among children, at age 5, in Australia's Northern Territory. *Early Childhood Research Quarterly*, 35, 124-134. <https://doi.org/10.1016/j.ecresq.2015.12.008>
- Hallett, D., Chandler, M. J., & Lalonde, C. E. (2007). Aboriginal language knowledge and youth suicide. *Cognitive Development*, 22(3), 392-399. <https://doi.org/10.1016/j.cogdev.2007.02.001>
- Haque, E., & Patrick, D. (2015). Indigenous languages and the racial hierarchisation of language policy in Canada. *Journal of Multilingual and Multicultural Development*, 36(1), 27-41. <https://doi.org/10.1080/01434632.2014.892499>
- Harding, L. (2022). Bringing together Indigenous and Western approaches to brain wellness and mental health: Not only the what but the way [Master's thesis, University of British Columbia]. (<https://dx.doi.org/10.14288/1.0418551>).
- Harding, L., Delaurier-Lyle, K., Ellis, U., Schillo, J., & Turin, M. (2021, January 26). Indigenous linguistic vitality and health: A scoping review protocol. OSF. (<https://osf.io/2j89t/>).
- Harding, L., Marra, C. J., & Illes, J. (2021). Establishing a comprehensive search strategy for Indigenous health literature reviews. *Systematic Reviews*, 10(1), 115. <https://doi.org/10.1186/s13643-021-01664-y>
- Harfield, S., Pearson, O., Morey, K., Kite, E., Canuto, K., Glover, K., Gomersall, J. S., Carter, D., Davy, C., Aromataris, E., & Braunack-Mayer, A. (2020). Assessing the quality of health research from an Indigenous perspective: The Aboriginal and Torres Strait Islander quality appraisal tool. *BMC Medical Research Methodology*, 20(1), 79. <https://doi.org/10.1186/s12874-020-00959-3>
- Hayward, A., Wodtke, L., Craft, A., Robin, T., Smylie, J., McConkey, S., Nychuk, A., Healy, C., Star, L., & Cidro, J. (2021). Addressing the need for indigenous and decolonized quantitative research methods in Canada. *SSM - Population Health*, 15, Article 100899. <https://doi.org/10.1016/j.ssmph.2021.100899>
- Healey, G. K., & Meadows, L. M. (2008). Tradition and culture: An important determinant of Inuit women's health. *Journal of Aboriginal Health*, 4(1), 25-33.
- Henderson, J.A. (2009). Factors associated with use of traditional healers in American Indians and Alaska natives. In M. Incaiyawar, R. Wintrob, L. Bouchard, & G. Bartocci (Eds.), *Psychiatrists and traditional healers: Unwitting partners in global mental health*. (pp. 93-106). Wiley-Blackwell. <https://doi.org/10.1002/9780470741054.ch8>
- Hilgendorf, A., Guy Reiter, A., Gauthier, J., Krueger, S., Beaumier, K., Corn, R. S., Moore, T. R., Roland, H., Wells, A., Pollard, E., Ansell, S., Oshkeshequoam, J., Adams, A., & Christens, B. D. (2019). Language, culture, and collectivism: Uniting coalition partners and promoting holistic health in the menominee nation. *Health education behavior: The official publication of the society for public health education*, 46(1), 81S-87S. <https://doi.org/10.1177/1090198119859401>
- Hinton, L., & Meek, B. A. (2018). *Language revitalization in indigenous North America. The Routledge handbook of language revitalization*. Routledge.
- Hiscock, R., Bauld, L., Amos, A., Fidler, J. A., & Munafò, M. (2012). Socioeconomic status and smoking: A review. *Annals of the New York Academy of Sciences*, 1248, 107-123. <https://doi.org/10.1111/j.1749-6632.2011.06202.x>
- Hodge, F. S., Cantrell, B. G., & Kim, S. (2011). Health status and sociodemographic characteristics of the morbidly obese American Indians. *Ethnicity Disease*, 21(1), 52-57.
- Hossain, B., & Lamb, L. (2019). Cultural attachment and wellbeing among Canada's Indigenous people: A rural urban divide. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being*. <https://doi.org/10.1007/s10902-019-00132-8>
- House, T. (2016). The power of words: Can Indigenous languages reduce youth suicide rates? *APT National News*. (<https://www.aptnnews.ca/national-news/the-power-of-words-can-indigenous-languages-reduce-youth-suicide-rates-2/>).
- House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs. (2012). Our land our languages: Language learning in Indigenous communities [Report]. House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs. (<https://apo.gov.au/node/31133>).
- Illes, J., Perreault, M. L., Bassil, K., Bjaalie, J. G., Taylor-Bragge, R. L., Chneiweiss, H., ... Velarde, M. R. (2025). Two-Eyed Seeing and other Indigenous perspectives for neuroscience. *Nature*, 638, 58-68. <https://doi.org/10.1038/s41586-024-08437-2>
- Indigenous Languages Act, Government of Canada (2019). (<https://laws-lois.justice.gc.ca/eng/acts/l-7.85/page-1.html>).
- Inuitq, S. (2016). Inuit language in Nunavut (Indigenous Languages: Preservation and Revitalization: Articles 13, 14 and 16 of the United Nations Declaration on the Rights of Indigenous Peoples (New York, 19 - 21 January 2016)) [Paper]. United Nations. (http://www.un.org/esa/socdev/unpfi/documents/2016/egm/Paper_Inuitq2.pdf).
- Iwama, M., Marshall, M., Marshall, A., & Bartlett, C. (2009). Two-eyed seeing and the language of healing in community-based research. *Canadian Journal of Native Education*, 32(2), 3-23.
- Jacklin, K., & Warry, W. (2010). Forgetting and forgotten: Dementia in Aboriginal seniors. *Abstracts*, 463. <https://doi.org/10.1037/e682032011-001>
- Jacob, M. M., Sabzalian, L., Johnson, S. R., Jansen, J., & Morse, G. S. (2019). We need to make action NOW, to help keep the language alive": Navigating tensions of engaging Indigenous educational values in university education. *American Journal of Community Psychology*, 64(1/2), 126-136. <https://doi.org/10.1002/ajcp.12374>
- Jaeger, F. N., Pellaud, N., Laville, B., & Klauser, P. (2019). Barriers to and solutions for addressing insufficient professional interpreter use in primary healthcare. *BMC Health Services Research*, 19, 753. <https://doi.org/10.1186/s12913-019-4628-6>
- Janssen, I., Lévesque, L., & Xu, F. (2014). Correlates of physical activity among First Nations children residing in First Nations communities in Canada. *Canadian Journal of Public Health*, 105(6), e412-e417. <https://doi.org/10.17269/cjph.105.4526>
- Jenni, B., Anisman, A., McIvor, O., & Jacobs, P. (2017). An exploration of the effects of mentor-apprentice programs on mentors' and apprentices' wellbeing. *International*

- Journal of Indigenous Health, 12(2), 25–42. <https://doi.org/10.18357/ijih122201717783>
- King, M. (2015). Contextualization of socio-culturally meaningful data. *Canadian Journal of Public Health = Revue Canadienne De Léolott Santé Publique*, 106(6), Article e457. <https://doi.org/10.17269/CJPH.106.5328>
- King, C., Atwood, S., Lozada, M., Nelson, A. K., Brown, C., Sabo, S., Curley, C., Musckett, O., Orav, E. J., & Shin, S. (2018). Identifying risk factors for 30-day readmission events among American Indian patients with diabetes in the Four Corners region of the southwest from 2009 to 2016. *PLOS One*, 13(8), Article e0195476. <https://doi.org/10.1371/journal.pone.0195476>
- Kovach, M. (2021). *Indigenous methodologies: Characteristics, conversations, and contexts* (2nd ed.). University of Toronto Press.
- Lévesque, L., Janssen, I., & Xu, F. (2015). Correlates of physical activity in First Nations youth residing in First Nations and northern communities in Canada. *Canadian Journal of Public Health*, 106(2), e29–e35. <https://doi.org/10.17269/cjph.106.4567>
- Li, T., Higgins, J., Deeks, J., Higgins, J., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M., & Welch, V. (2022). Chapter 5: Collecting data. *Cochrane handbook for systematic reviews of interventions version 6.3*. Cochrane. (www.training.cochrane.org/handbook)
- Liebenberg, L., Ikeda, J., & Wood, M. (2015). "It's just part of my culture": Understanding language and land in the resilience processes of Aboriginal youth. In L. C. Theron, L. Liebenberg, & M. Ungar (Eds.), *Youth resilience and culture: Commonalities and complexities*. (Vol. 11, pp. 105–116). Springer. https://doi.org/10.1007/978-94-017-9415-2_8
- Mako, S. (2012). Cultural genocide and key international instruments: Framing the Indigenous experience. *International Journal on Minority and Group Rights*, 19(2), 175–194. <https://doi.org/10.1163/157181112X639078>
- Māori Language Act, 176, Te Puni Kōkiri (1987). (<https://www.legislation.govt.nz/act/public/1987/0176/latest/whole.html>)
- Mclvor, O., Napoleon, A., & Dickie, K. M. (2009). Language and culture as protective factors for at-risk communities. *Journal of Aboriginal Health*, 5(1), 6–25. <https://doi.org/10.18357/ijih51200912327>
- McKenzie, J. (2020). Approaching from many angles: Seeing the connections for our languages to live. *Modern Language Journal*, 104(2), 501–506.
- Meisel, S., & Kieley, K. (1981). Graphic prescription labels. *American Journal of Hospital Pharmacy*, 38(8), 1116.
- Mercille, G., Receveur, O., & Potvin, L. (2012). Household food insecurity and Canadian Aboriginal women's self-efficacy in food preparation. *Canadian Journal of Dietetic Practice and Research: A Publication of Dietitians of Canada = Revue Canadienne De Léolott Louisiana Pratique et De Léolott Louisiana Recherche Eno 'sis Dietetique: Une Publication Des Dietetistes Delutan Canada*, 73(3), 134–140.
- Miles, S. H. (2004). *The hippocratic oath and the ethics of medicine*. Oxford University Press.
- Mlinarić, A., Horvat, M., & Šupak Šmolčić, V. (2017). Dealing with the positive publication bias: Why you should really publish your negative results. *Biochemia Medica*, 27(3), Article 030201. <https://doi.org/10.11613/BM.2017.030201>
- Moses, M., Johnson, E. S., Anger, W. K., Burse, V. W., Horstman, S. W., Jackson, R. J., Lewis, R. G., Maddy, K. T., Mcconnell, R., Meggs, W. J., & Zahm, S. H. (1993). Environmental equity and pesticide exposure. *Toxicology and Industrial Health*, 9(5), 913–959. <https://doi.org/10.1177/074823379300900512>
- Myers, T., Bullock, S. L., Calzavara, L. M., Cockerill, R., Marshall, V. W., & George-Mandoka, C. (1999). Culture and sexual practices in response to HIV among Aboriginal people living on-reserve in Ontario. *Culture, Health Sexuality*, 1(1), 19–37. <https://doi.org/10.1080/136910599301148>
- Nasreen, S., Brar, R., Brar, S., Maltby, A., & Wilk, P. (2018). Are Indigenous determinants of health associated with self-reported health professional-diagnosed anxiety disorders among Canadian First Nations adults? Findings from the 2012 Aboriginal Peoples Survey. *Community Mental Health Journal*, 54(4), 460–468. <https://doi.org/10.1007/s10597-017-0165-0>
- Native American Languages Act, S.2167, 101st United States Congress (1990). (<https://www.congress.gov/bill/101st-congress/senate-bill/2167>)
- Noreen, W., Johnson-Down, L., Jean-Claude, M., Lucas, M., Robinson, E., & Batal, M. (2018). Factors associated with the intake of traditional foods in the Eeyou Istchee (Cree) of northern Quebec include age, speaking the Cree language and food sovereignty indicators. *International Journal of Circumpolar Health*, 77(1), 1536251. <https://doi.org/10.1080/22423982.2018.1536251>
- Norris, M., & MacCon, K. (2004). Aboriginal language transmission and maintenance in families: Results of an intergenerational and gender-based analysis for Canada, 1996. In J. White, P. Maxim, & D. Beavon (Eds.), *Aboriginal conditions: Research as a foundation for public policy* (pp. 164–196). University of British Columbia Press.
- Olawsky, K. J. (2020). Concerns over funding for Australian Indigenous languages – Key points. Mirima Dawang Woolab-gerring Language and Culture Centre (Kunmurra). (<http://mirima.org.au/wp-content/uploads/2020/08/Concerns-over-Federal-funding-for-Australian-Indigenous-languages-RELEASE.pdf>)
- Oldfield, J. G. (2016). *Anangu Muru Wunka—Talking Black Fella: A critical policy analysis of the Northern Territory compulsory teaching in English for the first four hours of each school day [PhD thesis]*. University of Melbourne.
- Oster, R. T., Grier, A., Lightning, R., Mayan, M. J., & Toth, E. L. (2014). Cultural continuity, traditional Indigenous language, and diabetes in Alberta first nations: A mixed methods study. *International Journal for Equity in Health*, 13(1), 92. <https://doi.org/10.1186/s12939-014-0092-4>
- Patrick, D. (2005). Language rights in Indigenous communities: The case of the Inuit of Arctic Quebec. *Journal of Sociolinguistics*, 9(3), 369–389. <https://doi.org/10.1111/j.1360-6441.2005.00297.x>
- Pearce, M. E., Jongbloed, K. A., Richardson, C. G., Henderson, E. W., Pooyak, S. D., Oviedo-Joekes, E., Christian, W. M., Schechter, M. T., Spittal, P. M., & Cedar Project Partnership. (2015). The Cedar Project: Resilience in the face of HIV vulnerability within a cohort study involving young Indigenous people who use drugs in three Canadian cities. *BMC Public Health*, 15(100968562), 1095. <https://doi.org/10.1186/s12889-015-2417-7>
- Perdue, D. G., Henderson, J. A., Garrouette, E., Bogart, A., Wen, Y., Goldberg, J., & Buchwald, D. (2011). Culture and colorectal cancer screening on three American Indian reservations. *Ethnicity Disease*, 21(3), 342–348.
- Perley, B. C. (2011). *Defying Maliseet language death: Emergent vitalities of language, culture, and identity in Eastern Canada*. University of Nebraska Press. <https://doi.org/10.2307/j.ctt1df4g4t>
- Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., McInerney, P., Godfrey, C. M., & Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Synthesis*, 18(10), 2119–2126. <https://doi.org/10.11124/JBIES-20-00167>
- Phillips, M. (2010). Understanding resilience through revitalizing traditional ways of healing in a kanienkehaka community [Masters, Concordia University]. (<https://spectrum.library.concordia.ca/id/eprint/7071/>)
- Pine, A., & Turin, M. (2017). Language revitalization. Oxford research encyclopedia of linguistics, Generic. (<https://doi.org/10.1093/acrefore/9780199384655.013.8>)
- Public Health Agency of Canada. (2021, February 16). Public health ethics framework: A guide for use in response to the COVID-19 pandemic in Canada [Guidance]. (<https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/canadas-reponse/ethics-framework-guide-use-response-covid-19-pandemic.html>)
- Puebla, C. A. C. (2014). *Indigenous researchers and epistemic violence. Qualitative inquiry outside the academy*. Routledge.
- Redwood, D., Ferucci, E. D., Schumacher, M. C., Johnson, J. S., Lanier, A. P., Helzer, L. J., Tom-Orme, L., Murtough, M. A., & Slattery, M. L. (2008). Traditional foods and physical activity patterns and associations with cultural factors in a diverse Alaska Native population. *International Journal of Circumpolar Health*, 67(4), 335–348.
- Redwood, D., Lanier, A. P., Brubaker, M., Orell, L., Tom-Orme, L., George, C., Edwards, S., & Slattery, M. (2012). Occupational and environmental exposures among Alaska Native and American Indian people living in Alaska and the Southwest United States. *Journal of Environmental Health*, 74(9), 22–28.
- Redwood, D., Lanier, A. P., Renner, C., Smith, J., Tom-Orme, L., & Slattery, M. L. (2010). Differences in cigarette and smokeless tobacco use among American Indian and Alaska Native people living in Alaska and the Southwest United States. *Nicotine Tobacco Research*, 12(7), 791–796. <https://doi.org/10.1093/ntr/ntq087>
- Requesens-Galnares, A. (2023). Why indigenous languages matter: The International decade on indigenous languages 2022–2032 (151; UN DESA Policy Brief). United Nations Department of Economic and Social Affairs. (<https://www.un.org/development/dpad/publication/un-desa-policy-brief-no-151-why-indigenous-languages-matter-the-international-decade-on-indigenous-languages-2022-2032/>)
- Ritchie, H. (2023, October 15). The Voice: Australians vote No in historic referendum. BBC News. (<https://www.bbc.com/news/world-australia-67110913>)
- Roche, G. (2022). The necropolitics of language oppression. *Annual Review of Anthropology*, 51(1), 31–47. <https://doi.org/10.1146/annurev-anthro-041420-102158>
- Rodriguez-Lonebear, D., Barcelo, N. E., Akee, R., & Carroll, S. R. (2020). American Indian reservations and COVID-19: Correlates of early infection rates in the pandemic. *Journal of Public Health Management and Practice*, 26(4), 371–377. <https://doi.org/10.1097/PHH.0000000000001206>
- Royal Commission of Aboriginal Peoples. (1996). *Gathering strength: Report of the Royal Commission on Aboriginal Peoples* (Volume 3; p. 730). (<https://www.bac-lac.gc.ca/eng/discover/aboriginal-heritage/royal-commission-aboriginal-peoples/Pages/Item.aspx?IdNumber=402>)
- Running Bear, U., Croy, C. D., Kaufman, C. E., Thayer, Z. M., Manson, S. M., & The AL-SUPERPPF Team. (2018). The relationship of five boarding school experiences and physical health status among Northern Plains Tribes. *Quality of Life Research*, 27(1), 153–157. <https://doi.org/10.1007/s11136-017-1742-y>
- Russell, L. (2018). Te Oranga Hinengaro – Māori mental wellbeing: Results from the New Zealand Mental Health Monitor & Health and Lifestyles Survey. Health Promotion Agency/Te Hirainga Hauora. (<https://www.hpa.org.nz/sites/default/files/Final-report-TeOrangaHinengaro-M%4C%81ori-Mental-Wellbeing-Oct2018.pdf>)
- Ryan, C. J., Cooke, M., & Leatherdale, S. T. (2016). Factors associated with heavy drinking among off-reserve First Nations and Métis youth and adults: Evidence from the 2012 Canadian Aboriginal Peoples Survey. *Preventive Medicine*, 87, 95–102. <https://doi.org/10.1016/j.ypmed.2016.02.008>
- Ryan, C. J., Cooke, M., Kirkpatrick, S. I., Leatherdale, S. T., & Wilk, P. (2018). The correlates of physical activity among adult Métis. *Ethnicity Health*, 23(6), 629–648. <https://doi.org/10.1080/13557858.2017.1294655>
- Ryan, C. J., Cooke, M. J., Leatherdale, S. T., Kirkpatrick, S. I., & Wilk, P. (2015). The correlates of current smoking among adult Métis: Evidence from the Aboriginal Peoples Survey and Metis Supplement. *Canadian Journal of Public Health = Revue Canadienne De Léolott Santé Publique*, 106(5), e271–e276. <https://doi.org/10.17269/cjph.106.5053>
- Ryan, C. J., Leatherdale, S. T., & Cooke, M. J. (2016). A cross-sectional examination of the correlates of current smoking among off-reserve first nations and Métis adults: Evidence from the 2012 Aboriginal Peoples Survey. *Addictive Behaviors*, 54(2gw), 7603486, 75–81. <https://doi.org/10.1016/j.addbeh.2015.12.004>
- Ryan, C. J., Leatherdale, S., & Cooke, M. (2017). Factors associated with current smoking among off-reserve First Nations and Métis youth: Results from the 2012 Aboriginal peoples survey. *The Journal of Primary Prevention*, 38(1–2), 105–119. <https://doi.org/10.1007/s10935-016-0456-1>
- Sapir, E. (1929). The status of linguistics as a science. *Language*, 5(4), 207–214. <https://doi.org/10.2307/409588>

- Schumacher, M. C., Slattery, M. L., Lanier, A. P., Ma, K.-N., Edwards, S., Ferucci, E. D., & Tom-Orme, L. (2008). Prevalence and predictors of cancer screening among American Indian and Alaska native people: The EARTH study. *Cancer Causes Control*, 19(7), 725–737. <https://doi.org/10.1007/s10552-008-9135-8>
- Shafiee, M., Keshavarz, P., Lane, G., Pahwa, P., Szafron, M., Jennings, D., & Vatanparast, H. (2022). Food security status of Indigenous peoples in Canada according to the 4 pillars of food security: A scoping review. *Advances in Nutrition*, 13(6), 2537–2558. <https://doi.org/10.1093/advances/nmac081>
- Sharma, R., Pooyak, S., Jongbloed, K., Zamar, D., Pearce, M. E., Mazzuca, A., Schechter, M. T., Spittal, P. M., & Cedar Project Partnership. (2020). The Cedar Project: Historical, structural and interpersonal determinants of involvement in survival sex work over time among Indigenous women who have used drugs in two Canadian cities. *The International Journal on Drug Policy*, 87(9014759). <https://doi.org/10.1016/j.drugpo.2020.103012>
- Shaw, P. A. (2001). Language and identity: Language and the land. *BC Studies: The British Columbian Quarterly*, 131, 131. <https://doi.org/10.14288/bcs.v0i131.1595>
- Sibthorpe, B., Anderson, I., & Cunningham, J. (2001). Self-assessed health among indigenous Australians: How valid is a global question? *American Journal of Public Health*, 91(10), 1660–1663. <https://doi.org/10.2105/AJPH.91.10.1660>
- Simpson, L. B. (2017). *As we have always done: Indigenous freedom through radical resistance*. University of Minnesota Press. <https://doi.org/10.5749/j.ctt1pwt77c>
- Sivak, L., Westhead, S., Richards, E., Atkinson, S., Richards, J., Dare, H., Zuckermann, G., Gee, G., Wright, M., Rosen, A., Walsh, M., Brown, N., & Brown, A. (2019). “Language breathes life”-Barnarla community perspectives on the wellbeing impacts of reclaiming a dormant Australian Aboriginal language. *International Journal of Environmental Research and Public Health*, 16(20). <https://doi.org/10.3390/ijerph16203918>
- Skutnabb-Kangas, T., & Phillipson, R. (2023). *Handbook of linguistic human rights*. John Wiley & Sons, Inc.
- Smandych, R. (2013). Colonialism, settler colonialism, and law: Settler revolutions and the dispossession of Indigenous peoples through law in the long nineteenth century. *Settler Colonial Studies*, 3(1), 82–101. <https://doi.org/10.1080/18380743.2013.761937>
- Smith, L. T. (2021). *Decolonizing methodologies: Research and Indigenous peoples* (Third. Zed Books.
- Statistics Canada. (2012). Aboriginal peoples Survey 2012 – Education and employment. Statistics Canada. (https://www.statcan.gc.ca/en/statistical-programs/instrument/3250_Q10_V1).
- Statistics Canada. (2022). Indigenous population continues to grow and is much younger than the non-Indigenous population, although the pace of growth has slowed. The Daily. (<https://www150.statcan.gc.ca/n1/daily-quotidien/220921/dq220921a-eng.htm>).
- Stats NZ Tauranga Aotearoa. (2022). Māori population estimates: At 30 June 2022. Stats NZ. (<https://www.stats.govt.nz/information-releases/maori-population-estimates-at-30-june-2022/>).
- Taff, A., Chee, M., Hall, J., Hall, M. Y. D., Martin, K. N., & Johnston, A. (2018). Indigenous language use impacts wellness. In K. L. Reh, & L. Campbell (Eds.), *The Oxford handbook of endangered languages* (pp. 861–884). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780190610029.013.41>
- Tapia, K. A., Garvey, G., McEntee, M. F., Rickard, M., Lydiard, L., & Brennan, P. C. (2019). Breast screening attendance of Aboriginal and Torres Strait Islander women in the Northern Territory of Australia. *Australian and New Zealand Journal of Public Health*, 43(4), 334–339. <https://doi.org/10.1111/1753-6405.12917>
- Te Ture Mō Te Reo Māori/ Māori Language Act, 17, Te Puni Kōkiri (2016). (<https://www.legislation.govt.nz/act/public/2016/0017/latest/whole.html#DLM6174518>).
- Temple, J. B., & Russell, J. (2018). Food insecurity among older Aboriginal and Torres Strait Islanders. *International Journal of Environmental Research and Public Health*, 15(8). <https://doi.org/10.3390/ijerph15081766>
- Teng, A., Blakely, T., Scott, N., Jansen, R., Masters-Awatere, B., Krebs, J., & Oetzel, J. (2019). What protects against pre-diabetes progressing to diabetes? Observational study of integrated health and social data. *Diabetes Research and Clinical Practice*, 148, 119–129. <https://doi.org/10.1016/j.diabres.2018.12.003>
- The Aboriginal Healing Foundation. (2006). Decolonization and healing: Indigenous experiences in the United States, New Zealand, Australia and Greenland (The Aboriginal Healing Foundation Research Series). Aboriginal Healing Foundation. (<https://ehprnh2mwo3.exactdn.com/wp-content/uploads/2021/01/ibpengweb.pdf>).
- Thunderbird Partnership Foundation, & Health Canada. (2015). First Nations mental wellness continuum framework. Health Canada. (http://epe.lac-bac.gc.ca/100/201/301/weekly_checklist/2015/internet/w15-12-F-E.html/collections/collection_2015/sc-hc/H34-278-1-2014-eng.pdf).
- Thurber, K. A., Thandrayan, J., Banks, E., Doery, K., Sedgwick, M., & Lovett, R. (2020). Strengths-based approaches for quantitative data analysis: A case study using the Australian longitudinal study of indigenous children. *SSM - Population Health*, 12, Article 100637. <https://doi.org/10.1016/j.ssmph.2020.100637>
- Townsend, C. K. M. (2014). *Impacts of Hawaiian language loss and promotion via the linguistic landscape* [Doctoral dissertation, University of Hawai'i at Mānoa]. ProQuest Dissertations Publishing. (<https://www.proquest.com/docview/1652530324?pq-origsite=gscholar&fromopenview=true>).
- Turin, M. (2012). Voices of vanishing worlds: Endangered languages, orality, and cognition. *AnáLise Social*, 47(205), 846–869.
- UNESCO. (2020). Upcoming decade of indigenous languages (2022 – 2032) to focus on indigenous language users' human rights. UNESCO. (<https://en.unesco.org/news/upcoming-decade-indigenous-languages-2022-2032-focus-indigenous-language-users-human-rights>).
- United Nations Economic and Social Council. (2016). Report of the expert group meeting on ‘Indigenous languages: Preservation and revitalization’ (articles 13, 14 and 16 of the United Nations Declaration on the Rights of Indigenous Peoples)”. United Nations Economic and Social Council. (<https://documents-dds-ny.un.org/doc/UNDOC/GEN/N16/055/48/PDF/N1605548.pdf?OpenElement>).
- United Nations General Assembly. (2007). United Nations declaration on the rights of indigenous peoples: Resolution / adopted by the General Assembly. (<https://www.refworld.org/docid/471355a82.html>).
- United States Census Bureau. (2021, October 4). Facts for features: American Indian and Alaska native heritage Month: November 2021. United States Census Bureau. (<https://www.census.gov/newsroom/facts-for-features/2021/ai-an-month.html>).
- University of Alberta Library. (2025, March). Indigenous peoples search filters. University of Alberta Library. (<https://guides.library.ualberta.ca/fnmi-search-filters>).
- van Beek, S. (2016). Intersections: Indigenous language, health and wellness [Undergraduate Thesis, University of British Columbia]. (https://fpc.ca/wp-content/uploads/2020/08/Intersections_Indigenous_Language_Health_and_Wellness_WebVersion.pdf).
- Van Bever, V., & Woodgate, R. L. (2017). Examining the correlates of current smoking among off-reserve First Nations, Métis and Inuit youth: Evidence from the 2012 Aboriginal Peoples Survey. *Addictive Behaviors*, 69, 93–97. <https://doi.org/10.1016/j.addbeh.2017.02.017>
- Veracini, L. (2010). Settler colonialism: A theoretical overview. *Settler colonialism: A theoretical overview*. Palgrave Macmillan.
- Waldrum, J. B. (1990a). Access to traditional medicine in a western Canadian city. *Medical Anthropology*, 12(3), 325–348.
- Waldrum, J. B. (1990b). The persistence of traditional medicine in urban areas: The case of Canada's Indians. *American Indian and Alaska Native Mental Health Research*, 4(1), 9–29.
- Whalen, D. H., Lewis, M. E., Gillson, S., McBeath, B., Alexander, B., & Nyhan, K. (2022). Health effects of Indigenous language use and revitalization: A realist review. *International Journal for Equity in Health*, 21(1), 169. <https://doi.org/10.1186/s12939-022-01782-6>
- Whalen, D. H., Moss, M., & Baldwin, D. (2016). Healing through language: Positive physical health effects of indigenous language use. *F1000Research*, 5, 852. <https://doi.org/10.12688/f1000research.8656.1>
- Whitbeck, L. B., Chen, X., Hoyt, D. R., & Adams, G. W. (2004). Discrimination, historical loss and enculturation: Culturally specific risk and resiliency factors for alcohol abuse among American Indians. *Journal of Studies on Alcohol*, 65(4), 409–419.
- Wilgosh, L., Mulcahy, R., & Watters, B. (1986). Assessing intellectual performance of culturally different, Inuit children with the WISC-R. *Canadian Journal of Behavioural Science / Revue Canadienne Des Sciences Débutant Comportement*, 18(3), 270–277. <https://doi.org/10.1037/h0079994>
- Williams, S. T. (2011). *The importance of teaching and learning Aboriginal languages and cultures: The triangularity between language and culture, educational engagement, and community cultural health and wellbeing: A literature based research study for the New South Wales context* [Monograph]. New South Wales Department of Education and Communities. (<https://www.proquest.com/reports/importance-teaching-learning-aboriginal-languages/docview/1520750118/se-2?accountid=14656>).
- Wilson, R.D. (1997). Bringing them home: Report of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families. Human Rights and Equal Opportunity Commission. (<https://humanrights.gov.au/our-work/bringing-them-home-report-1997>).
- Wolfe, P. (2006). Settler colonialism and the elimination of the native. *Journal of Genocide Research*, 8(4), 387–409. <https://doi.org/10.1080/14623520601056240>
- Zhang, Y., Lee, E. T., Cowan, L. D., North, K. E., Wild, R. A., & Howard, B. V. (2005). Hysterectomy prevalence and cardiovascular disease risk factors in American Indian women. *Maturitas*, 52(3–4), 328–336.
- Zienczuk, N., & Egeland, G. M. (2012). Association between socioeconomic status and overweight and obesity among Inuit adults: International polar year inuit health survey, 2007–2008. *International Journal of Circumpolar Health*, 71(1), 1–7. <https://doi.org/10.3402/ijch.v71i0.18419>