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NARRATIVE REVIEW

An overview of outputs of Aboriginal- and Torres Strait Islander-related publications from University Departments of Rural Health in Australia; 2010–2021

Sandra C. Thompson PhD[1] | **Emma V. Taylor Grad Dip**[1] | **Ha Hoang PhD**[2] | **Lisa Hall PhD**[3] | **Bahram Sangelaji PhD**[4] | **Charmaine Green PhD**[1] | **Carolyn Lethborg PhD**[2] | **Joanne Hutchinson MPS**[5]

[1]Western Australian Centre for Rural Health (WACRH), University of Western Australia, Geraldton, Western Australia, Australia

[2]Centre for Rural Health, School of Health Sciences, University of Tasmania, Launceston, Tasmania, Australia

[3]Rural Health Bendigo, Monash University, Bendigo, Victoria, Australia

[4]Southern Queensland Rural Health, University of Queensland, Harlaxton, Queensland, Australia

[5]Australian Rural Health Education Network, Canberra, Australian Capital Territory, Australia

Correspondence
Sandra C. Thompson, Western Australian Centre for Rural Health (WACRH), University of Western Australia, PO Box 109, Geraldton, WA 6531, Australia.
Email: sandra.thompson@uwa.edu.au

Abstract

Introduction: Disparities in the health of Indigenous people and in the health of rural populations are well described. University Departments of Rural Health (UDRHs) in Australia are federally funded under a program to address ongoing challenges with health workforce distribution for rural and remote areas. They have a significant role in research in regional, rural and remote areas, including research related to Indigenous health. However, a comprehensive analysis of their contributions to original Indigenous health related to Indigenous health is lacking.

Objective: This study examines the contributions of UDRHs to Indigenous issues through analysis of publications of UDRHs focused on Indigenous health during the period 2010–2021.

Design: This paper examines a database of UDRH Indigenous-related publications from 2010 to 2021.

Findings: A total of 493 publications to which UDRHs contributed were analysed, including 354 original research articles. Health services research was the most common category, followed by epidemiology and papers exploring Indigenous culture and health. While health services research substantially increased over the period, the numbers of original research papers specifically focused on Indigenous workforce issues, whether related to Indigenous people, students or existing workforce was relatively small.

Discussion: This broad overview shows the nature and trends in Indigenous health research by UDRHs and makes evident a substantial contribution to Indigenous health research, reflecting their commitment to improving the health and well-being of Indigenous communities.

Conclusions: The analysis can help direct future efforts, and future analyses should delve deeper into the impact of this research and further engage Indigenous researchers.

KEYWORDS

Aboriginal and Torres Strait Islander, Australia, collaboration, First Nations, health services research, Indigenous, rural health academic centre, rural health workforce, rural research, University Department of Rural Health

1 | BACKGROUND

University Departments of Rural Health (UDRH) are academic centres based in regional, rural and remote (RRR) locations across Australia and have been part of the Australian rural and remote health landscape for more than 25 years. They were established as a rural health workforce program, now known as the Rural Health Multidisciplinary Training (RHMT) Program by the Australian Government as one component of a strategy to redress ongoing health workforce shortages in rural and remote areas. Starting with two UDRHs in 1996, investment in UDRHs has steadily increased, so that, as of July 2023, there are 19 UDRHs across the country (for timeline see File S1). In 2001, the Australian Rural Health Education Network (ARHEN) was established as peak body for UDRHs to provide leadership and strategic direction in rural health education and research, strengthen the UDRH network through coordination and communication, and to represent UDRH interests through a national voice and conduit for members. The main roles of the UDRHs are to facilitate rural and remote health training for nursing and allied health students, support the local health workforce with accessible and tailored training, and to build the evidence base on rural and remote health issues.

The Rural Health Multidisciplinary Training (RHMT) Program has key performance indicators which include the requirement to develop a research plan to the Department of Health and Aged Care and reporting of key research metrics. Academics working within UDRHs are encouraged to undertake research, which can be funded by external grants or supported as a component of their core funding grant. Since their inception in 1996–1997, UDRHs have developed a body of evidence on rural and remote health. Previous assessments of UDRH research outputs have been undertaken and identified the nature of the research undertaken. In Gausia and colleagues' analysis of the 11 UDRHs (at that time) 2008–2010 publications, for 14% of the articles Indigenous health was the main subject.[1] A publication on how UDRHs were contributing to rural health improvement described academic input to many significant regional projects that aimed to develop new models of care, improve service access, support better-trained

What is already known on this subject

- The first University Departments of Rural Health (UDRHs) were established over 25 years ago. Rurally based academics in multiple rural locations to support students undertaking clinical placements and support the rural workforce, undertake research and engage with the rural communities in which they are based.
- UDRH research reflects efforts to address challenges that occur in rural and remote communities.
- Many UDRHs are based in regions with a significant Indigenous population, and UDRHs have shown a high commitment to working with Indigenous communities and contributing to their health and well-being.
- No previous analysis of UDRH publications has been undertaken to examine the number and nature of Indigenous-related publications and trends over time.

What this paper adds

- Over the 12-year period 2010–2021, UDRHs have contributed 493 publications with Indigenous and cultural security health as their primary focus.
- There is substantial diversity in publications, with health services research the largest category of research publications.
- Given the focus of UDRHs on workforce and their publications on workforce, this analysis highlights the need for additional efforts to specifically promote building the Indigenous health workforce.

health professionals, or build capacity in organisations and communities, and reported that in 2013 there were 220 peer-reviewed papers of which 86% were applied research and 40% addressed some aspect of rural and/or remote health.[2]

Many UDRHs are located and work in regions with substantial Aboriginal and Torres Strait Islander (hereafter Indigenous) populations and work closely with local Indigenous people, health services and communities to improve health outcomes. This includes conducting locally relevant and culturally safe research; supporting staff, students and health professionals to understand and practise in a culturally safe manner; and encouraging Indigenous people in education and to consider health careers. One domain of focus for each UDRH under the RHMT is improving the number of Indigenous Australians people undertaking health careers as a means of improving the health of Indigenous Australians. UDRHs employ Indigenous staff in diverse roles including: related to advice around connecting appropriately with local Aboriginal people and organisations, research, and support of cultural learning of staff and students. To date, no specific analysis of how UDRHs have been contributing to Indigenous health and well-being has been undertaken.

Major government programs undergo periodic external review to assess performance against the stated program objectives and the ongoing relevance and performance of the program. As part of a response to an announced review of the RHMT, in 2019 ARHEN established an Endnote library, initially to serve as a central repository of UDRH health training and workforce research from 2010 onwards. This database was used for a review to be provided to the evaluation team which undertook the Independent Evaluation of the RHMT Program in 2020.[3,4] This review focused on health workforce but noted that many of the papers reported on work with Indigenous communities, and while focused on health, well-being and care delivery did not meet the criteria for inclusion in the review of workforce.[4] The authors noted the level of engagement with Indigenous communities highlighted the importance of this UDRH role and the need to continue to build on the existing work with Indigenous communities.

Given substantial and sustained commitment by UDRHs to advancing Indigenous health and the identified significant proportion of publications relevant to Indigenous health in the Endnote database, a proposal to undertake an analysis of all Indigenous health related publications in the Endnote database was supported by the ARHEN Board in 2021. Nominations to join this project were invited from UDRH staff at the beginning of 2022 with Indigenous academic staff encouraged to contribute to the analysis. The research team of eight people representing four UDRHs, located across five states and territories, was established in March 2022. This paper examines the nature of publications with a focus on Indigenous health that were published by the UDRHs over the period 2010–2021 and discusses the growth in and type of Indigenous health-related outputs over this time. It is the first output of the Indigenous Outputs Working group and provides a broad overview of the nature of these publications in peer-reviewed journals over the 12-year period.

2 | METHODS

The protocol for the review was developed, approved by the ARHEN Board and then confirmed by all co-authors (Table 1).

2.1 | Search strategy and screening

The search of the ARHEN Endnote library was undertaken in May 2022. Key search words 'Aboriginal', 'Indigenous' 'Torres Strait' and 'First Nations' were searched using the title, keyword and abstract fields. Results were limited to items published between the years of 2010 and 2021 inclusive. Quality checks were undertaken to eliminate duplicates and ensure all articles were peer-reviewed and appropriate for inclusion. Initially, three reviewers independently screened titles and abstracts of publications using the predetermined exclusion criteria (Table 1) to determine eligibility for full text review. Particular attention by a subgroup of three co-authors was paid to the 174 articles that did not have any of the key search terms in the title, given the focus on what the UDRHs had contributed to Indigenous health research rather than incidental comparisons or mention of Indigenous people. Following this, 497 articles were eligible for full text review. The results for each stage of the search and screening processes are shown in the PRISMA flow diagram (Figure 1).

2.2 | Analysis

After several iterations of coding approaches, we adapted the overarching coding strategy that was described by Sanson-Fisher and colleagues[5] in their critical review of Indigenous research outputs over time (see File S2 for coding detail). Briefly, this allowed for all publications to be coded as research; literature reviews; protocols (for reviews or research studies); program descriptions; commentaries or editorials; or case reports. Research publications were then grouped into subcategories: descriptive; intervention and measurement. Research publications were also subclassified into the following broad

TABLE 1 Article inclusion and exclusion criteria.

Domain	Included	Excluded
Time period	2010–2021	Prior to 2010 and post 2021
Language	English	Non-English
Journal	Refereed (peer reviewed) journals only	Grey literature, conference proceedings, published abstracts
Type of articles	Research articles (Quantitative, Qualitative and mixed-method study designs), case studies, reviews, commentaries and editorials on research, research policy papers	Opinion pieces, letters that are not research related
Scope	Focus on the health of Indigenous peoples and/or significant inclusion of Indigenous participants in study design or sample	Not health related, Indigenous peoples not specifically identified
Article authorship	At least one author's organisational affiliation listed as a UDRH	No UDRH affiliation listed
Setting/location	Australia	Studies conducted outside of Australia

descriptive categories: health services research; epidemiology, Indigenous culture and needs for health and wellbeing; workforce issues; and others (to include clinical treatments). The major topic area for the research was also captured. Health services research included papers that examined quality of care, quality improvement, evaluation of health services or health service access and care delivery. Epidemiology papers reported population level data whereas health services research looked at outcome comparisons or disparities for specified services and were potentially disease specific. The category of workforce considered workforce issues, development and professional education around care of Indigenous people, and was classified under three subcategories (i) developing Indigenous people's skills and capacity; (ii) developing cultural safety or skills in students; or (iii) developing cultural safety/skills in health professionals. Indigenous Culture and Health included papers that looked at cultural values, delivery or services in a culturally safe way, and barriers to health care access for Indigenous people because of insufficient attention to cultural values.

Any concerns related to the classification were flagged by the initial reviewer and checked by a small group. Any papers that presented outstanding challenges were resolved by discussion within a wider group. The in-depth coding identified four papers that were reconsidered by the coding group and excluded as unsuitable because they were not health related or did not contain sufficient information. This left a total of 493 articles which form the basis of this review.

Descriptive analysis was undertaken in Excel using simple frequencies and percentages. To look at trends over time, the 12-year period was examined with the first 6-year period compared to the second 6-year period. No adjustment was made for the number of UDRHs.

3 | RESULTS

3.1 | The number and type of publications

Across the 12-year period, the total of 493 Indigenous publications varied by year but increased from 23 in 2010 to 57 in 2021. Publication numbers increased by 29% from 215 in 2010–2015 to 277 in 2016–2021 (Figure 2 and Table 2). Six of the 12 years had 46 or more publications.

Research articles comprised the largest group (354 of 493; 71.8%), with review papers the second largest category (62; 12.6%) and commentaries or editorials the third largest (39; 7.9%). Articles classified as program descriptions reduced (from 16 to 8), the number of protocols increased (from 2 to 11), and review article numbers remained steady (32 and 30).

Given the large number of research publications and review papers, these categories will be explored in greater depth in future publications, with only an overview provided here. Similarly, program descriptions, more evident in the first half of the period and important for understanding the context and approach of UDRHs' work with

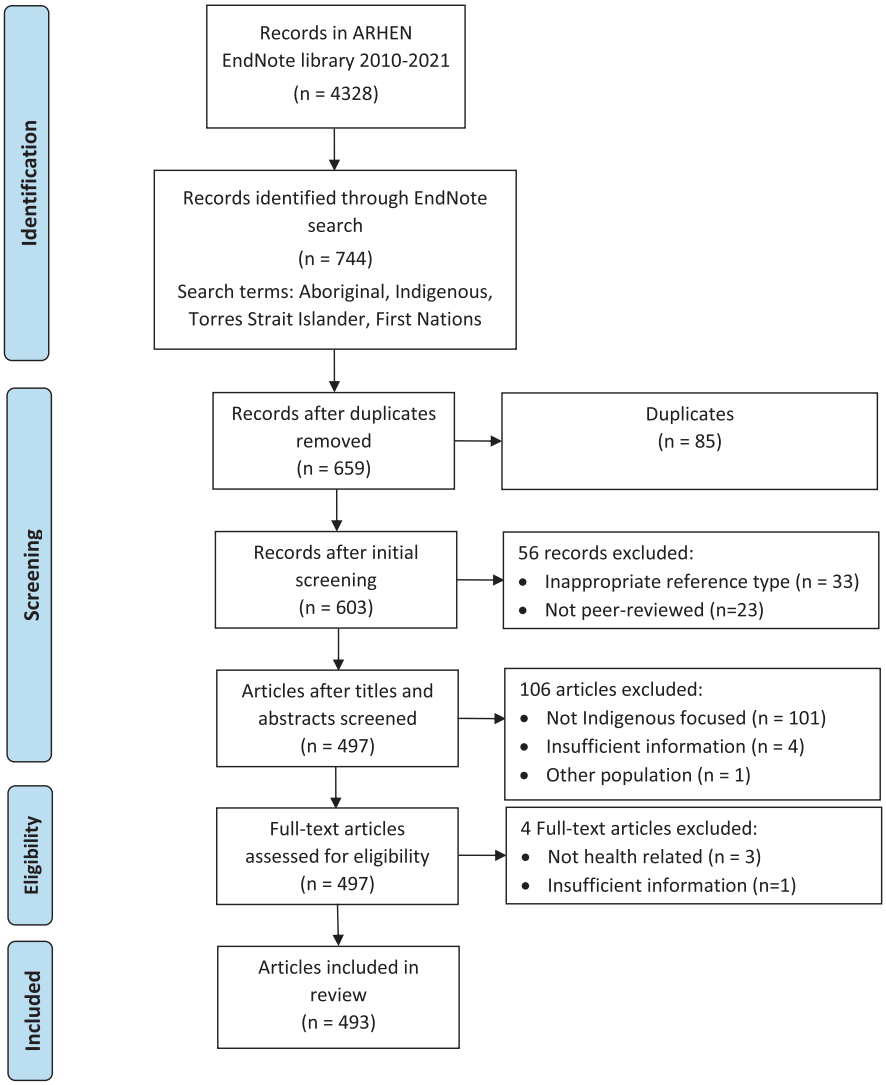

FIGURE 1 Search results and screening process based on PRISMA statement.

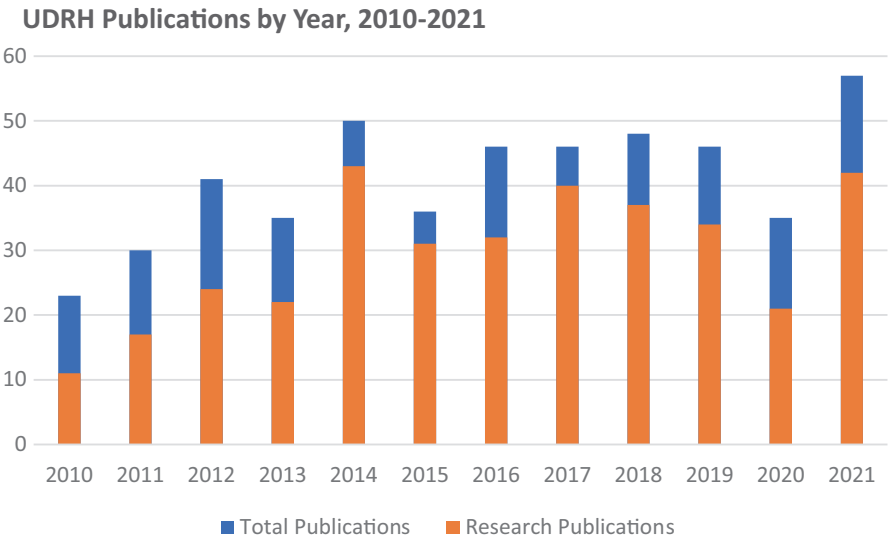

FIGURE 2 UDRH Indigenous Articles by Year, Original Research and Total, 2010–2021.

Indigenous people, will also be described in more detail elsewhere. Some description of the publications classified as protocols or as commentaries or editorials is provided below.

3.2 | Protocols

Over the 12-year period, there was a substantial change in the number of papers classified as protocols, with only

TABLE 2 Number of UDRH Indigenous health publications by type of publication and subcategory of original research, 2010–2015 and 2016–2021.

	2010–2015	2016–2021	2010–2021
Original Research	148	206	354
Descriptive	128	162	290
Intervention	12	24	36
Measurement	8	20	28
Commentary/editorial	17	22	39
Program description	16	8	24
Protocol	2	11	13
Review	32	30	62
Total	215	277	492[a]

[a]There was one Case Report that is not included in this table.[48]

two in the period 2010–2015, and 11 published between 2016 and 2021. Only one protocol was for a systematic review of literature, and this examined stroke in Indigenous populations in developed countries.[6] The other study protocols covered a wide range of study topics and types, including improving health workforce outcomes,[7,8] studies to improve perinatal care,[9] pregnancy,[10] maternal and child health,[11] cardiovascular[12] and Indigenous primary health care clinical performance.[13] There was also a process evaluation protocol describing data collection from all phases and sites during the control and intervention phase of a stepped wedge randomised controlled trial (RCT) aiming to improve outcomes for Indigenous people with brain injury following stroke or traumatic brain injury.[14]

Four protocols were for randomised controlled trials (RCTs). Guy et al. utilised a crossover cluster RCT in 12 regional or remote Australian health services to improve community sexually transmitted infection rates through access to point of care testing.[15] McAullay and colleagues described an intervention which was a population-based, stepped wedge, cluster RCT of an enhanced model of early infant primary care to improve primary care access for babies with the main outcome of reducing hospitalisations in children less than 3 months of age.[16] Armstrong et al. described an intervention to improve rehabilitation for stroke and traumatic brain injury. This stepped wedge cluster RCT design had Quality of Life measures as the primary outcome measure.[17] Another primary health intervention aimed to improve detection and management of dementia and used a stepped-wedge cluster RCT design working with 12 Aboriginal Community Controlled Health Services (ACCHSs) across four states of Australia, with rates of documentation of dementia and CIND (cognitive impairment not dementia), and evidence of improved management of dementia and CIND among older Indigenous peoples.[18] None of the first authors of the RCTs had a UDRH affiliation.

3.3 | Commentaries/editorials

A total of 39 papers were classified as editorials or commentaries with 17 in the period 2010–2015 and 22 in the 2016–2021 period. Twelve focused on topics related to Indigenous culture and health, from understanding culture, to building cultural competence and respect and developing culturally appropriate, responsive and safe health service delivery. A further 11 commentaries and editorials talked more specifically about issues in health service provision and health promotion on a range of topics from maternal health, general practice (GP) and primary care,[19,20] health assessments, aged care and suicide prevention. Six editorials focused on the epidemiology of specific health conditions including cardiac rehabilitation, optometry, cancer, diabetes and musculoskeletal-related issues. A further six editorials commented on issues around building research capacity,[21] research priorities and continuous quality improvement and reflection. Two editorials focused on capacity building and empowerment of the Indigenous workforce. Four of the papers made specific reference to 'Closing the Gap'.

3.4 | Reviews

The number of reviews were similar across the two time periods, with 62 in total. These covered a wide range of types of review (e.g. systematic, integrative, narrative) and descriptive classifications (e.g. related to Indigenous culture and health, workforce including students and Indigenous people, health services, epidemiology and other assorted classifications). The topics of the reviews were diverse so only examples are provided here, but they can be broadly classified into health risks and related interventions (e.g. well-being, including mental and physical issues and comorbidities; nutrition and physical activity interventions); health service access, delivery and disparities in care as well as approaches to addressing these; a range of chronic diseases and health issues, including international comparisons; education and workforce reviews; methodological issues and approaches for Indigenous data and assessments; and Indigenous culture, history and beliefs related to traditional and complementary and bush medicine.

3.5 | Content of original research publications

Of the 354 original research contributions, the largest category was predominantly descriptive ($n = 290$; 81.9%). There were 36 articles (10.2%) describing intervention research and 28 (7.9%) were classified as measurement. Numbers of intervention research papers doubled from 12 to 24, and measurement papers more than doubled, from 8 to 20 across the two 6-year periods.

Research was further categorised into different content areas including Indigenous culture and health, Epidemiology, Health Services Research and Workforce (Table 3). Health Services Research was the largest number of research publications (135 of 354; 38.1%), followed by Epidemiology (24.3%). Nearly 13% of the research publications addressed workforce issues, split between professional workforce (4.5%), Indigenous workforce (3.4%) and student workforce (5%). While there has been an increase in workforce publications over the period, there were relatively small numbers in the subcategories of health professional, student and Indigenous workforce development in any 1 year. Research that was focused on Indigenous culture and health accounted for ~12% during the period from 2010 to 2021, with the number of articles decreasing over the two periods from 25 to 15. Further analysis of the research publications will be reported separately, but as File S3 shows, there was little change across the two periods in the proportion of papers by different categories of rurality, although 43.2% and 44.2% examined multiple levels of remoteness. With respect to authorship affiliations, across the two time periods, there was a decrease in publications of the UDRH with just a university partner (from 68 (45.9%) to 46 (22.3%)) and a substantial increase in UDRHs with multiple partners (from 44 (29.7%) to 103 (50.0%)).

4 | DISCUSSION

Modern Australia remains linked to its settlement as a British colony, and this has cast a long shadow over the lives of Indigenous Australians. Colonisation disrupted traditional Indigenous lives through multiple violent, repressive and discriminatory acts and policies, and has left an ongoing legacy of disadvantage across multiple health, educational and social parameters.[22] As a result of displacement from their traditional lands, Indigenous people were excluded from developing settlements and pushed into less hospitable environments,[23] and are a greater proportion of the population based in rural and remote areas. There has been a slow dawning consciousness about Australia's past and the treatment of the original inhabitants of the land with the disparities in the health of Indigenous people and in the health of rural populations now well described; efforts to improve health services and train health care providers are an essential component of redressing care disparities.[24–27] UDRHs are based in rural and remote areas and have established connections with local Indigenous people and groups. This analysis shows the multiple ways UDRHs have engaged with Indigenous issues, working with them in health and education, employing Indigenous staff, working to improve cultural learning in staff and students and cultural safety in health settings, and through representing some of the issues Indigenous people and communities face and their experience in accessing health services as part of their academic research and writing. However, not all the papers adequately progressed Indigenous health, for some having little evident engagement of Indigenous people or a likely direct benefit to the people or community where the work was undertaken.

Over a long time, including preceding the period captured in this analysis, UDRHs have consistently published

TABLE 3 Number of UDRH Indigenous health research publications by type of original research, 2010–2015 and 2016–2021.

	Time period			
	2010–2015	2016–2021	2010–2021	Change between 6-year periods
Original Research total	148	206	354	1.39
Health services research	57	80	137	1.40
Epidemiology	40	46	86	1.15
Indigenous culture and health	25	15	40	0.60
Workforce total	14	31	45	2.21
Health professional	4	12	16	3.00
Student	8	9	17	1.13
Indigenous	2	10	12	5.00
Other	12	34	46	2.83

on issues related to Indigenous health and well-being. For the work reported here, we utilised a database of UDRH publications which was established in 2020 but included publications from 2010 to 2021. Our aim was to provide an overview of UDRH contributions in Indigenous health over the period 2010–2021. With nearly 500 publications identified as having an Indigenous health focus over these 12 years, the contribution of UDRHs to this field has been substantial. Research publications were 72% of the publications, with the balance of peer-reviewed publications which were not primary research classified as protocols, reviews, program descriptions and commentary/editorials. Only a brief analysis of protocols, reviews, commentaries/editorials and research has been presented in this paper with the intention to undertake in-depth analysis of research and the reports of program descriptions. Deeper exploration can provide more assessment of the value of these publications to knowledge creation and their contribution to policy, practice and building greater capacity including greater understanding of Indigenous beliefs and ways of being and doing.

Sanson-Fisher and colleagues in 2006 examined Indigenous health publications across Australia, New Zealand, Canada and the USA, four developed countries with a history of colonisation which resulted in poorer Indigenous health.[5] Their analysis sampled publications from three different 2- or 3-year periods from 1987 to 2003. We ultimately adopted the same framework for coding the UDRH Indigenous-related articles. Our findings for a subsequent period (2010–2021) found a similar preponderance of descriptive research (83% compared to 72%–92%), and the same smaller proportion of measurement (8% vs. 0%–11%) and intervention (10% vs. 0%–18%) research for the UDRH and the Sanson-Fisher analyses, respectively. This suggests that Australia had progressed similarly in research to the other developed countries with a history of colonisation over the period 1987–2003. This also included a period in which there were policy changes and considerable increased investment by Australia's National Health and Medical Research Council (NHMRC) from 1997 to 2002 to better support Indigenous health, including the commitment of 5% of its budget to Indigenous health research and frameworks around better engagement of Indigenous people in and leading research.[28] Despite evidence of investment into capacity building through people support funding, it is unclear if much of that resourcing supported Indigenous researchers based in rural areas, an issue worthy of further interrogation. The underinvestment in rural health research has already been described[29] and in rural health services,[30] all of which impact on capacity, the support for people living in rural and remote areas and where Indigenous Australians are likely to be disproportionately impacted given their known health and social issues.

Primary research formed most of the peer-reviewed published outputs from the UDRHs over this period and the nature of UDRH research and its contributions to understanding, capacity building, policy and practice deserves deeper consideration. Research is acknowledged as important for its contribution to building Australia's innovation and it contributes to evaluation and refinement of existing programs. The largest group of research publications was for health services research, and this increased by 35% between the two periods of assessment. It is widely recognised that Australia needs 'better models of health care and services that improve outcomes, reduce disparities for disadvantaged and vulnerable groups, increase efficiency and provide greater value for a given expenditure'.[31] Achieving this requires a research culture that promotes understanding and embraces research to improve health, ideally creating a partnership between researchers and end-users of the research. UDRHs based in regions and rural and remote areas are ideally placed to develop these relationships and progress relevant research in partnership with their community and with local Indigenous people and organisations. It is unsurprising that a substantial, if minor, proportion of UDRH publications have specifically focused on the health of Indigenous people since improving Indigenous health is explicitly mentioned with the type of research which RHMT-funded centres are encouraged to undertake. Other areas for RHMT research are rural health workforce development, health issues directly impacting rural populations, and innovative rural service delivery models to enable health services to meet community needs, all areas to which UDRHs have turned their attention in relation to Indigenous health. The Aboriginal and Torres Strait Islander Staff Network of ARHEN now has over 40 Indigenous members, many with longevity of employment within their UDRH, and meets regularly for support, sharing information and planning. Given the strong focus of UDRHs on building the rural health workforce, identifying only 45 publications that specifically examined Indigenous issues related to workforce, spread across students, health professionals and Indigenous workforce, seemed surprisingly low and further attention in this area is warranted. Nevertheless, workforce and models of care delivery were major considerations in some health services research[7,8,32] and review papers[33] and the impacts of workforce turnover on health for Indigenous people have also been described.[8,19,34,35]

Indigenous research is increasingly a contested area in terms of the involvement of non-Indigenous people and analysing what has been done historically is important in efforts to direct efforts in the future.[36] Our analysis showed there is still considerable descriptive research being

undertaken by UDRHs in relation to Indigenous health. Yet, clearly, intervention research can be very difficult in practice and RCTs may not provide benefit for small rural and remote communities and Indigenous people. The analysis by Kinchin and colleagues of Indigenous health reviews which met eligibility criteria is relevant here.[37] They tested whether research hypotheses were stated and tested and whether they addressed Indigenous health priority needs; utilised best practice guidelines on research conduct and reporting in respect to methodological transparency and rigour, as well as the acceptability and appropriateness of research implementation to Indigenous people; and whether the review explicitly reported the incremental impacts of the included studies and translation of research. They found little reporting of the impact of health research for Indigenous people and identified knowledge and methodological gaps in documenting Indigenous health research impact to be addressed by researchers and policy-makers and to improve the reporting and assessment of impact over time.[37] Researchers have often commented on the additional efforts and time to undertake research with Indigenous people and noted that researchers working with Indigenous communities must continue to resolve conflict between the values of the academic setting and those of the community.[38] This can mean that funding is already stretched in undertaking the research, reducing opportunities for time and advocacy for research translation. Ways to support better Indigenous research and partnerships must be ongoing and informed by a more contemporary understanding of history, power, privilege, including efforts and failures.[39–44]

4.1 | Limitations

There are several limitations of the current review which focused on the UDRH publication outputs which had a focus on Indigenous health. The database used relied upon the publication data from the UDRHs having been accurately reported and captured in the ARHEN database. This may not be perfectly accurate as some omissions were identified in the process of using the database and corrected. While other omissions may not have been identified, we expected these would be a small proportion of the overall output of UDRHs. We relied upon the publications provided by the UDRHs to be publication outputs of the UDRHs and our proposed more detailed analysis of the subcategories may identify issues with misclassifications. While we utilised the coding framework described by Sanson-Fisher and colleagues, judgements around classifying papers were still required, although we made considerable efforts to ensure a rigorous process for checking coding and any uncertainties. The ARHEN database was not established in a way where individual UDRH contributions were quantitated; this likely will be increasingly difficult in future as cross UDRH collaborations and publications grow. There has been an increase in UDRHs over time, with 11 at the beginning of the period and a further three added in 2017 and one in 2019, plus one that was established in 1999 splitting to be administered separately by two different universities in 2016 (File S1). No adjustment was made for changes in the denominator. Publications over this period also did not include information on authors other than their name and affiliation, so it was not possible to assess the contribution of Indigenous researchers as authors to the publications. We know many UDRHs work with Indigenous staff members and colleagues in their research and that many publications include Indigenous authors with efforts to engage and build understanding of research with Indigenous colleagues occurring throughout. While the authors have a sense of this in their own workplaces, an assessment of this across the UDRH network and over the period under review is not possible. However, recently a number of journals have instituted the requirement that all Indigenous-related research include an Indigenous author, which may make assessment of Indigenous contributions to the research more transparent in future.[45] There are arguments that authorship is an important way of recognising and showing respect for Indigenous people, as active agents in the research process and recognising Indigenous cultural ideas, values and principles to contribute to and inform Indigenous research.[46] Furthermore, we did not make any assessment of the quality of contributions, including through application of an Indigenous lens on the publications, and we acknowledge the changes that have occurred over the time in relation to standards and expectations around Indigenous-related research and publications.[45] We are also cognisant of the importance of building research capacity to ensure high-quality research.[47]

5 | CONCLUSIONS AND FUTURE REVIEWS

This analysis of the publications of UDRHs show a significant number of contributions to Indigenous health research between 2010 and 2021. It reveals a strong focus on health services research, reflecting the role of UDRHs in improving health care delivery in rural and remote areas for Indigenous people. However, our analysis revealed surprisingly little research which specifically addressed workforce related to Indigenous health, despite the huge importance of building and supporting the Indigenous health care workforce.

UDRHs have played a pivotal role in bridging the gap between academia and Indigenous communities, and in supporting the undertaking of research, aware of the need for it to be culturally sensitive, locally relevant and to support Indigenous leadership in prioritising the topics for research and conducting it. The increase in the number of publications over this period indicates efforts related to Indigenous health research have continued and grown over the period. This could reflect the increasing number of UDRHs although not all UDRHs have engaged in Indigenous health research. However, we know that certain UDRHs have sustained their efforts with respect to engaging Indigenous people as part of their work and to Indigenous health research, using some of the resources of the RHMT, and in addition through additional support from grant funding bodies.

Future efforts should focus on assessing the impact of this research on Indigenous communities and learning from the body of research to improve future efforts. This includes further engaging Indigenous researchers in the process as well as determining its influence on policy and practice. There has been much greater attention on Indigenous health in the policy environment over time and increases in Indigenous-led solutions to the longstanding issues that beset Indigenous communities. Addressing workforce issues and building capacity among Indigenous health care professionals must be a major priority for UDRHs to ensure sustainable improvements in Indigenous health and well-being.

AUTHOR CONTRIBUTIONS

Sandra C. Thompson: Conceptualization; investigation; methodology; writing – original draft; validation; writing – review and editing; project administration. **Emma V. Taylor:** Methodology; validation; visualization; writing – review and editing; investigation; data curation; project administration. **Ha Hoang:** Investigation; writing – review and editing; validation; methodology. **Lisa Hall:** Investigation; validation; writing – review and editing; methodology. **Bahram Sangelaji:** Investigation; validation; methodology; writing – review and editing. **Charmaine Green:** Investigation; writing – review and editing. **Carolyn Lethborg:** Investigation; validation; writing – review and editing. **Joanne Hutchinson:** Data curation; project administration; Investigation; validation; writing – review and editing; methodology; conceptualization.

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The authors declare that they have no competing interests.

ETHICAL APPROVAL

None.

ORCID

Sandra C. Thompson https://orcid.org/0000-0003-0327-7155
Emma V. Taylor https://orcid.org/0000-0002-8612-4738
Ha Hoang https://orcid.org/0000-0001-5116-9947
Lisa Hall https://orcid.org/0000-0002-2290-695X
Bahram Sangelaji https://orcid.org/0000-0002-0405-7915
Carolyn Lethborg https://orcid.org/0000-0001-9063-1954

REFERENCES

1. Gausia K, Thompson SC, Lindeman MA, Brown LJ, Perkins D. Contribution of university departments of rural health to rural health research: an analysis of outputs. Aust J Rural Health. 2015;23(2):101–6.
2. Humphreys J, Lyle D, Barlow V. University departments of rural health: is a national network of multidisciplinary academic departments in Australia making a difference? Rural Remote Health. 2018;18(1):1–11.
3. Battye K, Sefton C, Thomas JM, Smith J, Springer S, Skinner I, et al. Independent evaluation of the rural health multidisciplinary training program: final report to the commonwealth Department of Health. Orange, Australia: KBC Australia; 2020.
4. Walsh S, Thompson S, Lyle D, Brown L, Versace V, Knight S, et al. A decade of UDRH-led health workforce research in rural and remote Australia: a preliminary report for KBC Australia. Whyalla: University of South Australia, Department of Rural Health; 2020.
5. Sanson-Fisher RW, Campbell EM, Perkins JJ, Blunden SV, Davis BB. Indigenous health research: a critical review of outputs over time. Med J Aust. 2006;184(10):502–5.
6. Balabanski AH, Dos Santos A, Woods JA, Thrift AG, Kleinig TJ, Suchy-Dicey A, et al. The incidence of stroke in indigenous populations of countries with a very high human development index: a systematic review protocol. Front Neurol. 2021;12:661570.

7. Fitts MS, Humphreys J, Dunbar T, Bourke L, Mulholland E, Guthridge S, et al. Understanding and responding to the cost and health impact of short-term health staffing in remote and rural Aboriginal and Torres Strait Islander community-controlled health services: a mixed methods study protocol. BMJ Open. 2021;11(8):e043902.
8. Wakerman J, Humphreys J, Bourke L, Dunbar T, Jones M, Carey TA, et al. Assessing the impact and cost of short-term health workforce in remote indigenous communities in Australia: a mixed methods study protocol. JMIR Res Protoc. 2016;5(4):e135.
9. Chamberlain C, Gee G, Brown SJ, Atkinson J, Herrman H, Gartland D, et al. Healing the past by nurturing the future-co-designing perinatal strategies for Aboriginal and Torres Strait Islander parents experiencing complex trauma: framework and protocol for a community-based participatory action research study. BMJ Open. 2019;9(6):e028397.
10. MacKay D, Kirkham R, Freeman N, Murtha K, Van Dokkum P, Boyle J, et al. Improving systems of care during and after a pregnancy complicated by hyperglycaemia: a protocol for a complex health systems intervention. BMC Health Serv Res. 2020;20(1):814.
11. Carlisle K, Felton-Busch C, Cadet-James Y, Taylor J, Bailie R, Farmer J, et al. Women's action for mums and bubs (WOMB) trial protocol: a non-randomized stepped wedge implementation trial of participatory women's groups to improve the health of Aboriginal and Torres Strait Islander mothers and children in Australia. Front Public Health. 2020;8:73.
12. Kearns T, Diaz A, Whop LJ, Moore SP, Condon JR, Andrews RM, et al. Investigating inequities in cardiovascular care and outcomes for Queensland Aboriginal and Torres Strait Islander people: protocol for a hospital-based retrospective cohort data linkage project. BMJ Open. 2021;11(3):e043304.
13. Bailie R, Si D, Shannon C, Semmens J, Rowley K, Scrimgeour DJ, et al. Study protocol: national research partnership to improve primary health care performance and outcomes for indigenous peoples. BMC Health Serv Res. 2010;10:129.
14. Skoss R, White J, Stanley MJ, Robinson M, Thompson S, Armstrong E, et al. Study protocol for a prospective process evaluation of a culturally secure rehabilitation programme for Aboriginal Australians after brain injury: the healing right way project. BMJ Open. 2021;11(9):e046042.
15. Guy RJ, Ward J, Causer LM, Natoli L, Badman SG, Tangey A, et al. Molecular point-of-care testing for chlamydia and gonorrhoea in indigenous Australians attending remote primary health services (TTANGO): a cluster-randomised, controlled, crossover trial. Lancet Infect Dis. 2018;18(10):1117–26.
16. McAullay D, McAuley K, Marriott R, Pearson G, Jacoby P, Ferguson C, et al. Improving access to primary care for Aboriginal babies in Western Australia: study protocol for a randomized controlled trial. Trials. 2016;17(1):82.
17. Armstrong E, Coffin J, Hersh D, Katzenellenbogen JM, Thompson S, Flicker L, et al. Healing right way: study protocol for a stepped wedge cluster randomised controlled trial to enhance rehabilitation services and improve quality of life in aboriginal Australians after brain injury. BMJ Open. 2021;11(9):e045898.
18. Bradley K, Smith R, Hughson JA, Atkinson D, Bessarab D, Flicker L, et al. Let's CHAT (community health approaches to) dementia in Aboriginal and Torres Strait Islander communities: protocol for a stepped wedge cluster randomised controlled trial. BMC Health Serv Res. 2020;20(1):208.
19. Wakerman J, Shannon C. Strengthening primary health care to improve indigenous health outcomes. Med J Aust. 2016;204(10):363–4.
20. Wakerman J, Stothers K. Aboriginal and Torres Strait Islander health. General practice embraces its significant role to close the gap. Aust Fam Physician. 2014;43(1):7.
21. Roe Y, Fredericks B, Coffin J, Adams M. Building indigenous research capacity: a personal perspective. Aborig Isl Health Work J. 2010;34(5):33–5.
22. Dudgeon P, Wright M, Paradies Y, Garvey D, Walker R. The social, cultural and historical context of Aboriginal and Torres Strait Islander Australians. In: Purdie N, Dudgeon P, Walker R, editors. Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice. Barton, ACT: Australian Government Department of Health and Ageing; 2010. p. 25–42.
23. Paradies Y. Colonisation, racism and indigenous health. J Popul Res. 2016;33(1):83–96.
24. Durey A, Thompson SC. Reducing the health disparities of indigenous Australians: time to change focus. BMC Health Serv Res. 2012;12(1):1–11.
25. Kirmayer LJ, Brass G. Addressing global health disparities among indigenous peoples. Lancet. 2016;388(10040):105–6.
26. Lewis ME, Myhra LL. Integrated care with indigenous populations: considering the role of health care systems in health disparities. J Health Care Poor Underserved. 2018;29(3):1083–107.
27. Wilk P, Cooke M, Stranges S, Maltby A. Reducing health disparities among indigenous populations: the role of collaborative approaches to improve public health systems. New York: Springer; 2018. p. 1–2.
28. del la Barra SL, Eades S, Redman S. Health research policy: a case study of policy change in Aboriginal and Torres Strait Islander health research. Aust New Zealand Health Policy. 2009;6(1):2.
29. Barclay L, Phillips A, Lyle D. Rural and remote health research: does the investment match the need? Aust J Rural Health. 2018;26(2):74–9.
30. Nous Group. Evidence base for additional investment in rural health in Australia. Canberra: National Rural Health Alliance; 2023.
31. North K. Research priority: make Australia's health system efficient, equitable and integrated. The Conversation [Internet]. Available from: https://theconversation.com/research-priority-make-australias-health-system-efficient-equitable-and-integrated-43547
32. Taylor EV, Lyford M, Parsons L, Mason T, Sabesan S, Thompson SC. "We're very much part of the team here": a culture of respect for indigenous health workforce transforms indigenous health care. PLoS One. 2020;15(9):e0239207.
33. Taylor EV, Lalovic A, Thompson SC. Beyond enrolments: a systematic review exploring the factors affecting the retention of Aboriginal and Torres Strait Islander health students in the tertiary education system. Int J Equity Health. 2019;18(1):136.
34. Zhao Y, Russell DJ, Guthridge S, Ramjan M, Jones MP, Humphreys JS, et al. Costs and effects of higher turnover of nurses and Aboriginal health practitioners and higher use of

short-term nurses in remote Australian primary care services: an observational cohort study. BMJ Open. 2019;9(2):e023906.
35. Davidson PM, DiGiacomo M, Thompson SC, Abbott P, Davison J, Moore L, et al. Health workforce issues and how these impact on indigenous Australians. J Aust Indig Issues. 2011;14(4):69–84.
36. Wilson K, Bell T, Arreak A, Koonoo B, Angnatsiak D, Ljubicic G. Changing the role of non-indigenous research partners in practice to support Inuit self-determination in research. Arct Sci. 2020;6(3):127–53.
37. Kinchin I, Mccalman J, Bainbridge R, Tsey K, Lui FW. Does indigenous health research have impact? A systematic review of reviews. Int J Equity Health. 2017;16(1):1–16.
38. Cochran PA, Marshall CA, Garcia-Downing C, Kendall E, Cook D, McCubbin L, et al. Indigenous ways of knowing: implications for participatory research and community. Am J Public Health. 2008;98(1):22–7.
39. Edwards R, Moewaka Barnes H, McGregor D, Brannelly T. Supporting indigenous and non-indigenous research partnerships. Qual Rep. 2020;25(13):6–15.
40. Gittelsohn J, Belcourt A, Magarati M, Booth-LaForce C, Duran B, Mishra SI, et al. Building capacity for productive indigenous community-university partnerships. Prev Sci. 2020;21:22–32.
41. Absolon K, Dion S. Doing indigenous community-university research partnerships: a cautionary tale. Engaged Scholar J Commun Engaged Res Teach Learn. 2017;3(2):81–98.
42. Haynes E, Taylor KP, Durey A, Bessarab D, Thompson SC. Examining the potential contribution of social theory to developing and supporting Australian indigenous-mainstream health service partnerships. Int J Equity Health. 2014;13(1):75.
43. Axelsson P, Kukutai T, Kippen R. The field of indigenous health and the role of colonisation and history. J Popul Res. 2016;33(1):1–7.
44. Snijder M, Shakeshaft A, Wagemakers A, Stephens A, Calabria B. A systematic review of studies evaluating Australian indigenous community development projects: the extent of community participation, their methodological quality and their outcomes. BMC Public Health. 2015;15(1):1–16.
45. Lock MJ, McMillan F, Warne D, Bennett B, Kidd J, Williams N, et al. Indigenous cultural identity of research authors standard: research and reconciliation with indigenous peoples in rural health journals. Rural Remote Health. 2022;22(3):1–9.
46. Bennett B. What to bring when you are told not to bring a thing: the need for protocols in acknowledging indigenous knowledges and participants in Australian research. J Sociol. 2020;56(2):167–83.
47. Tsui AS. Contributing to global management knowledge: a case for high quality indigenous research. Asia Pac J Manag. 2004;21:491–513.
48. Miller A, Cairns A, Richardson A, Lawrence J. Supporting holistic care for patients with tuberculosis in a remote indigenous community: a case report. Rural Remote Health. 2020;20(1):5552.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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