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CABI One Health Cases – Case template

Title

Undertaking One Health research with Australian Aboriginal and Torres Strait Islander communities: Implications of a One Health pilot study

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Abstract

This case study presents the research process and learnings from undertaking One Health research within Australian Aboriginal and Torres Strait Islander community settings. One Health is relevant to Australian Aboriginal and Torres Strait Islander communities where people and animals (commonly dogs and cats) live closely together and face health risks due to barriers in accessing animal health care. One Health is an appropriate approach to understanding and addressing health disparities as it aligns with community and cultural contexts that recognise the relationships between the health of people, animals and the shared environment. However, with minimal evidence in this space, the contribution of One Health to Aboriginal and Torres Strait Islander health is not well understood limiting the ability to implement One Health approaches and address the needs of communities, families, animals, and the environment. This case study describes the research approach, methodology and implications from a pilot One Health study undertaken with Aboriginal and Torres Strait

Islander communities that adopted Indigenous research methodologies within a One Health framework.

Keywords: One Health, Aboriginal and Torres Strait Islander, animal health, transdisciplinary, Indigenous research

What is the incremental value that makes this a One Health case?

This case study describes the process, considerations, and implications of undertaking One Health research in Indigenous community settings. The approach presented in this example brings together Indigenous research methodologies and One Health approaches, highlighting the importance of community engagement and leadership within Indigenous health research. Using this approach, we developed and implemented a One Health data framework in Aboriginal and Torres Strait Islander communities, with key learnings and future research directions discussed.

Learning outcomes

1. Recognise the relevance of a One Health research approach within Aboriginal and Torres Strait Islander communities.
2. Discuss culturally appropriate research design and practices when undertaking One Health research in Indigenous community settings.
3. Analyse the principles for One Health research using the example of a pilot One Health study in selected Aboriginal and Torres Strait Islander communities.

Background and context

The One Health approach recognises the integral relationships between animal, human and environmental health (1). It has been promoted as an effective and sustainable approach to addressing continuing and emerging health risks at the animal-human-environment interface, such as zoonotic disease (2). One Health is highly relevant to Aboriginal and Torres Strait Islander health in Australia and aligned with community and cultural values that recognise the integral relationships between the health of people, animals and the environment (Figure 1) (3). Yet many Aboriginal and Torres Strait Islander communities face health risks related to the environment and animals, with a One Health approach likely to assist in combating these risks (4-6). However, there is limited evidence and examples of One Health approaches within the Aboriginal and Torres Strait Islander context and further work is needed to address this.



Figure 1: One Health concept (designed by Tamara Riley and Erin Walsh)

While many families have dogs and cats as pets (7), many Aboriginal and Torres Strait Islander communities face barriers in accessing animal health care. Implementing effective and sustainable animal health care can be challenging due to a history of mismanagement, distrust and a lack of understanding of animal ownership within community settings (8). There are also barriers to access including geographic and socioeconomic factors, and a lack of resources available in many communities, leading to health risks for families and their animals. Evidence shows delivering animal health care in under-resourced communities can lead to improvements in animal health and welfare outcomes (9-11). However, there is limited understanding of the impact of human and environmental health exposures on animal health outcomes and the development of indicators in all three One Health sectors is needed.

When undertaking research in Aboriginal and Torres Strait Islander community settings it is also important to consider Indigenous and One Health research approaches to ensure appropriateness and respect to the community (3). We present an example of One Health research undertaken with Aboriginal and Torres Strait Islander communities that adopted Indigenous research methodologies and a One Health approach. This pilot One Health study developed and implemented a One Health data framework to collect and analyse data on health risks that exist across the three domains of One Health within communities. This study was undertaken with communities that have limited access to animal health care services leading to increased health risks across the three One Health domains. We also discuss the considerations and implications from undertaking this pilot study and recommendations for future research.

Research Process

One Health framework

When undertaking One Health research, consideration of all three One Health domains is needed i.e. human health, animal health and environmental health components, as well as consideration of the relationships between sectors (12). While implementing One Health approaches in research can be challenging due to competing priorities and working styles across disciplines, the involvement of multiple stakeholders, and the additional time, ethics and data access approvals needed, the outcomes are beneficial and effective. Undertaking true One Health approaches requires adapting research training outside of specific disciplinary boundaries to incorporate multiple research teams, bringing together differing experiences, training and priorities towards a common goal (13).

We undertook a pilot One Health study by developing a One Health data framework for use in Aboriginal and Torres Strait Islander communities to collect and analyse human, animal and environmental health data on a household level (14). We used an ecological study design due to the holistic nature of One Health, recognising health outside of the individual level (12). Developing a One Health data framework can help in addressing the limitations in data availability and capability when undertaking One Health research in this space. Within this study, we considered the One Health domains as described in Table 1.

Table 1: One Health sector definitions

<i>Animal health</i>	<i>Human health</i>	<i>Environmental health</i>
Referred to the health of domestic animals (such as dogs and cats).	Referred to the health of people.	Referred to the health of ecosystems, including the physical environment, plants, and wildlife.

The One Health data framework involved the development and implementation of a data collection tool using household surveys that collected information on animal, human and environmental health factors. The International Companion Animal Management Coalition

(ICAM) suggests assessing public health indicators associated with animal health and welfare through the use of household surveys, in line with our research approach (15). The data collection was undertaken using the Animal Management in Rural and Remote Indigenous Communities (AMRRIC) animal population census application (16) and the RedCap application (17, 18). We collected information on household exposures and animal health outcomes, as well as community members' priorities around animal health care services. By taking this approach, we considered the relationships between human and environmental health exposures and animal health outcomes, thinking beyond the anthropocentric approach to One Health (19). By collecting data on all three One Health domains, it also allowed us to undertake a One Health analysis bringing together components from animal, human and environmental health within the data analysis (12).

Indigenous research methodologies

When working within Aboriginal and Torres Strait Islander community contexts, it is important to adopt research approaches that recognise the cultures, values and knowledges of the community and support local priorities (20). Therefore, along with a One Health research approach, we adopted Indigenous research methodologies with the study undertaken by an Aboriginal-led multidisciplinary research team. This methodology helps to prioritise Indigenous voices, support community leadership, and strengthen Indigenous health research reporting (21, 22), with community members feedback and priorities assisting in informing the design of the framework and subsequent outcomes. In line with Indigenous research methodologies, the data collection tool collected information on community members priorities for animal and environmental health practices within their communities. This approach is also in line with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) that aims for self-governance and Indigenous leadership within local community contexts (20, 23).

Transdisciplinary approach

We adopted a transdisciplinary approach as highlighted by the One Health principles, engaging with community organisations, service providers, and researchers in the design and implementation of the study (1). Transdisciplinary approaches require the breakdown of current siloed disciplinary approaches, with researchers working with community members, policy makers and health practitioners, bringing together their different experiences and knowledges, to work towards common goals and see meaningful impacts for communities (13).

The pilot One Health study involved the engagement of various stakeholders including researchers (The Australian National University and University of Edinburgh), community organisations (Indigenous Local Government Authorities), community members and their pets, and a national not-for-profit organisation (AMRRIC (24)). This stakeholder engagement allowed community members, researchers, and health practitioners to bring together their experiences and knowledges to work towards a common goal which was to understand current health risks and improve animal health and welfare, as is in line with the transdisciplinary approach (13). This study was also in line with the other underlying principles of One Health recognising equity, parity, equilibrium, and stewardship within the research approach, speaking to the importance of community based approaches (1).

Community engagement

Following this research approach, community engagement was involved throughout, from the design of the One Health data framework to the delivery of the fieldwork. Undertaking this research may differ based on community, with a one-size-fits-all approach unlikely to be suitable, and flexibility and adaptability to the context crucial. This speaks to the importance of community engagement as it can assist with incorporating community priorities into the research for effective outcomes, and adding context and meaning to the results and recommendations (12).

The One Health data framework was developed iteratively and adapted throughout to consider input from community members and study partners (Figure 2). When workshopping the framework, we recognised the mismanagement of animal health care that many communities have faced in the past, highlighting the importance of undertaking this work respectfully (8). After the initial pilot and workshop with the research team, we added some additional questions around animal husbandry, however as these additional questions were only asked in two out of three communities they were not used in the analysis.



Figure 2: Input into the design of the One Health data framework

Along with the data collection, we simultaneously delivered community-wide preventative animal health programs supported by the Indigenous Local Government Authorities and AMRRIC, which allowed for reciprocation and assisted with improving awareness of One Health. This also assisted with improving awareness of common animal health conditions, as many diseases seen in communities are treatable and preventable with access to animal health services. These programs can help to address many animal health and welfare concerns raised by community members (10). Findings and recommendations were fed back to the supporting community organisations with results specific to each community reported. This assisted with knowledge translation and exchange with supporting community organisations which is important in influencing local policies and programs, and forging the gap between health practitioners, researchers, and community members (25).

Study outcomes and recommendations

Study outcomes

This is the first study that implements a One Health data framework with Aboriginal and Torres Strait Islander communities in Australia. While this pilot study was a good start in understanding One Health within communities, there were many limitations which included a limited database and a large amount of missing data for some survey items. Further consideration on how to address this is needed for improved data completeness and subsequent analysis. Further development of the framework is also needed to improve the data capability and collect additional information on the relationships between the One Health domains.

Broad implications of this study included the priority of community members to have improved access to animal health care and improved education and awareness around animal health

and welfare. There was also a need to improve associated environmental health exposures within communities (such as housing factors and feral animal control) to aid in preventing communicable diseases and reducing health risks. However, resourcing for staff and training is required across communities to build the workforce with policy support likely to assist with this. This study also highlighted a lack of understanding of the One Health concept within communities, however this data item had many limitations with large amounts of missing data and requires further development. The results of this study will be built on through future research projects including further development of the One Health data framework with policy support and program capability within communities needing further consideration.

Recommendations

This study highlighted aspects for further development of the One Health data collection framework. The human health indicators included household crowding and wellbeing concerns for animal health, however it would be helpful to include more human health questions to further assess human health exposures. Asking about wellbeing concerns was of interest as animals are commonly considered part of the family and have close connections with community members, with animal health and welfare concerns affecting animals and their owners. Additionally, collecting information on concerns of community members in relation to their animal's health can help in the development of a One Health model and community animal health care programs.

The environmental health questions concentrated on household exposures that are commonly highlighted within the evidence base and can impact on health outcomes in many communities (26, 27). This was of interest as examples of poor health hardware can be health risks for many communities with poor environmental health factors impacting on health outcomes. This includes factors such as infrastructure and housing, washing and hygiene facilities, and pest and feral animal control (28). We also included other aspects of the environment that could be useful in assessing One Health factors, including the exposure to and interactions with wildlife due to the role wildlife can play in emerging zoonotic diseases (29). Further exploration of environmental determinants of health, including the continuing impacts of the changing climate on household health, needs further consideration and will continue to be a priority with the effects of climate change hypothesised to disproportionately impact Aboriginal and Torres Strait Islander communities (30).

The animal health outcomes were analysed using animal health assessments of cats and dogs at each household assessing them for common animal health and welfare indicators such as body condition score, hair score, and tick and flea score. The animal health survey items also included other animals' species that live in the household (besides cats and dogs) however, further information on the health of other animal species would be helpful in future iterations. After the initial data collection was undertaken, we workshopped two animal husbandry questions to account for the feedback and learnings we received from the initial fieldwork, including questions on hunting and interactions with animals (31). These questions were of interest due to the health risks these factors can pose to animal and human health, and the shared environment. However, as these questions were included after the initial data collection of the pilot study, they were not included in the analysis yet, but will be included in future iterations of the framework.

In addition to the animal, human and environmental health components, adding a social science component such as socio-cultural factors would be useful. This may include human behaviours, activities and past experiences relating to animal and environmental health factors to further build on the One Health approach (32, 33). This is also in line with the One Health principles that highlight the need for people to change behaviours and adopt transdisciplinary approaches which involve the inclusion of social sciences along with animal, human and environmental health fields in One Health research (1, 13). Addition of these items can also allow for the recognition of traditional knowledges and ways of working when enacting One Health approaches (1). This would help extend the subsequent analysis of the data from a

One Health analysis that concentrates on health outcomes, to an analysis that includes the social and cultural determinants of health and how they relate to household health.

Conclusions

While One Health is likely to be an effective approach for understanding and combatting health risks, its applicability within Aboriginal and Torres Strait Islander communities needs further investigation to inform One Health approaches. When undertaking research in this space, consideration of adapting the One Health framework using Indigenous research methodologies and transdisciplinary approaches is needed to prioritise Aboriginal and Torres Strait Islander engagement in the research. The pilot study presented was positively received by the communities and assisted in building the evidence base and data capability within the One Health space however, due to the limitations encountered, further development of the One Health data framework is needed.

The implications of the pilot One Health study highlighted the need to improve animal health care delivery and address environmental health risks within communities. To address these, sustainable resourcing and trained workforces are needed at a local level, with policy support likely to be of assistance. While One Health approaches are likely to be effective in this context, the involvement and leadership from the local community, along with engagement with policy makers, researchers, and health practitioners, are required to adopt a transdisciplinary approach and allow incorporation of community priorities in the study design. This study will be built on through further development of the One Health data framework and future research that aims to improve understanding of health risks across the One Health domains and inform One Health approaches within Aboriginal and Torres Strait Islander communities.

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Ethics

Ethical approval was provided by the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Research Ethics Committee (EO243-20210406).

Further reading

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Questions for group discussions

What is a One Health research framework?

What does a transdisciplinary approach involve?

What are some considerations when undertaking One Health research within Indigenous community settings?

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