Original Research

Using the Healthy Community Assessment Tool: Applicability and Adaptation in the Midwest of WA

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Abstract: Population based studies have associated poor living conditions with the persistent disparity in the health of Aboriginal and non-Aboriginal Australians. This project assesses the applicability of the Health Community Assessment Tool and its role in improving the environment of a small community in the Midwest of WA. The action research cycles started with the initial reflection on the suitability of the HCAT version 2 for the local community context and whether it was fit-for-purpose. The researcher provided 'critical companionship', while the participants of the study were invited to be co-researchers (the Assessors) who critically examined the HCAT and assess the community. The relevant domains to the serviced town (an outer regional community) were pest control and animal management; healthy housing; food supply; community vibrancy, pride and safety; reducing environmental tobacco smoke; and promoting physical activity. The Assessors found the HCAT descriptors mostly aligned with their community context but found some of the items difficult to apply. Based on participant's suggestions, some of the original scoring scales were reformatted. School attendance and illicit drug use were identified as a key outcome indicator for youth but were missing from the HCAT. The HCAT domains applied helped streamlining core business of agencies in the local community. The face validity of HCAT items were confirmed in this research with minor adjustments to reflect local context. Youth engagement to education is of high community concern and the development of an item would create similar interagency collaborative dialogues.

Keywords: Interagency partnership; Aboriginal health; Australian rural and remote communities

1. Introduction

There are significant health disparities for residents of small rural and remote communities compared to metropolitan Australian populations, particularly for Aboriginal people where the gap in life expectancy is variously reported as being between 11 and 18 years [1]. Given the complexity of life circumstances and the multi-morbidities of many Aboriginal people which make care needs more complex, partnerships between Aboriginal and mainstream agencies are essential for expediting improvements in Aboriginal health outcomes [2-4].

Population-based studies have associated poor living conditions with the persistent disparity in the health of Aboriginal and non-Aboriginal Australians including the gaps in infant mortality [5], childhood infections particularly skin infections [6,7], acute persistent diarrhea [8,9], rheumatic heart disease [10]. Water supply and sanitation in remote Aboriginal communities have been identified as

the priorities for health development, and the need for better quality information systems to monitor progress, equity and accountability in the delivery of water and sanitation services is considered a priority [11].

The Healthy Community Assessment Tool (HCAT) was developed and piloted through a multi-phase and iterative process that involved a series of consultations with community members and key stakeholders in the Northern Territory (NT) of Australia [12]. The tool was then trialed in remote NT Aboriginal communities, confirming its face validity with the scoring system reportedly well understood and easily followed by Aboriginal and non-Aboriginal study participants. The original authors suggested using a facilitated small group process to reduce bias in scoring of indicators [12].

The full HCAT version 2 has 13 domains with two to six items in each domain [12]. The concepts and constructs of the HCAT were informed by the socioecological theory, The Driving force, Pressure, State, Exposure, Effect, Actions (DPSEEA) framework and the Multiple Exposure Multiple Effect Model These theories and models help with assessing and understanding the relationship of diverse personal and environmental factors in human health and illness including the exploration of policy drivers that lead to pressure and change in the environment and hence health effects. Based on this understanding, actions can be taken at any point in this chain to mitigate or avoid unwanted health or social effects.

This research was undertaken as part of a broader research project which aims at improving Aboriginal health and wellbeing and is based upon recognition that better partnerships are needed to improve service delivery in complex but under-resourced environments. We were interested in testing and using existing structured tools to support and improve the working of partnerships between Aboriginal organisations and Mainstream organisations.

McDonald and colleagues reported on the development and trial of the HCAT in NT communities and concluded that the prototype offered many uses and benefits for community leaders, government officers and others seeking to measure environmental health conditions and address inequities in the social determinants of health in remote communities [12]. Their work focused on validating the tool constructs rather than its operation in the context of population health improvement processes. Since this initial trial, there has been no further report on application of the HCAT in Australian rural or remote communities so his paper focuses specifically on the adaptation of the HCAT in the course of this project.

This project aimed to assess the applicability and utility of the HCAT as a means of assessment and to improve the environment of small communities in the Midwest of WA. The rationale for using HCAT in this project was to use this evidence-based tool to facilitate collaborative dialogues on environmental health issues which the local interagency stakeholders saw as impacting on the health and wellbeing of the community. Priority was given to the content of the dialogues and actions coming from the discussions rather than to the absolute change in the scores for each HCAT applied.

The key feature of the investigation reported in this paper was the Midwest-based interagency stakeholders' assessment of the appropriateness of structured tools to support local actions, and the adaptation of selected domains in the HCAT to reflect local context. It forms part of a community-based action research which aims to address ingredients for success in translating evidence into population health improvements [13]. The objective of adaptation of the tool was to reflect the circumstances of small rural and remote Midwest communities of WA.

2. Materials and Methods

HCAT supported focus groups were the main method to conduct this study. The method has been chosen in this study to allow observation of group dynamics between interagency representatives and for the convenience of collecting both individual and consensus assessments from each of the HCAT items assessed. The scores were used as indication only, the focus of this study was on workings of the structured tool to drive collaborative actions in a small outer regional community in Western Australia.

2.1 Sampling and Recruitment

Purposive maximum variation sampling was used to ensure diversity of representation from agencies. All participants were residents in the Midwest region of WA and delivered human services to the small outer regional, remote or Aboriginal communities, and were released by their respective agencies and volunteered to participate in the HCAT facilitated focus groups.

2.1.1 Midwest Community Assessors' Group

Initial consultations occurred to help shape the project and understanding of community and local issues early 2013.

Midwest based interagency members were invited to participate in the initial baseline assessment in April 2013. Telephone invitations were followed by email information sent to a wide range of stakeholders by the local general practitioner. The research staff followed up with a face to face meeting to explain individually to stakeholders the proposed tools and application. The council-employed community development officer based in Midwest saw the proposed processes as an opportunity to provide direction and evaluate the functioning of the interagency meeting.

Formal invitations were emailed by the local shire to the broader interagency stakeholders who were residents of this outer regional West Australian location. Those who attended the first meeting formed the 'Midwest Assessors' Group' (the Assessors). The Assessors assumed facilitator roles in the process of project implementation, described in detail below.

2.1.2 Midwest Aboriginal Environment Health Program Team

To compare findings in the Midwest community with other rural and remote Aboriginal communities in the Midwest region, environmental health practitioners from the Midwest Aboriginal Environment Health Program were invited through the program coordinator to assess firstly the user friendliness of the tool to Aboriginal environmental health workers, and secondly the applicability of HCAT constructs to one of the remote Aboriginal communities the participants were currently working with. Participants in this group were Aboriginal adults residing in the regional centre and had more than 2 years of experience in delivering Environmental Health services to Aboriginal communities in the region.

2.1.3 WA Aboriginal Environmental Health Program Science and Policy Unit

The Senior Program Officer and Program Manager from the State Health Department Unit were invited to review the Midwest HCAT v2 for content validity. The state department staff ensured policy alignment and assessed whether the constructs within each item measures what they set out to measure. They then tested the tool in real time on their visits to Aboriginal communities outside of the Midwest region.

2.2 Data Collection and Analysis

Thematic analysis was performed on contextual input received from the Assessors, and the opinions from the three groups were interpreted as a whole. All suggested revisions were incorporated and tested by having the Assessors to score on both the original and revised versions at follow-up.

2.2.1 The Action Research Process

The action research (AR) cycles started with the initial reflection of the suitability of the HCAT version 2 for the local community context, whether it was fit-for-purpose and would support efforts of the Midwest interagency meeting to achieve local outcomes. The process involved two distinct AR cycles: the first involved baseline assessment, reflection and modification of the HCAT v2 to ensure suitability, appropriateness and user friendliness for context; the second included baseline assessment and mapping of various action plans and community-based strategies to inform collaborative planning and tangible actions in the community. This paper focuses on the first AR cycle.

2.2.2 Baseline Assessment

The baseline assessment served to examine the face validity of the tool descriptors with at least 3 participants (Assessors) completing the tool for each indicator, as per the instructions of the developers for administration of the HCAT. Scores were given to each component within the selected HCAT domains; overall scores were the result of consensus by Assessors and were then re-visited in discussions at the full interagency meetings.

The Assessors were also invited to comment on the relevance of the descriptors to the Midwest context and the user friendliness of the tool. Observations were made regarding the variation in the scores given by individual Assessors and discussed. The Assessors were also invited to comment both at baseline and follow-up on the appropriateness of the tool in supporting focused interagency discussions.

2.2.3 Face and Content Validity Checks

Based on the feedback at baseline, modifications were made to HCAT v2. These modifications also incorporated recommendations from a separate trial by the regional Aboriginal Environmental Health team to test the relevance of HCAT constructs to environmental health practice in Aboriginal communities in the Midwest.

Through a facilitated process, the Midwest Aboriginal Environmental Health Program (MAEHP) team provided feedback on their experience using the tool. Revisions were made accordingly with the modified tool termed the Midwest HCAT (version 1).

Midwest HCAT v1 was then taken to remote Aboriginal communities in Midwest and Kimberley respectively by the Senior Program Officer and Program Manager from the WA Aboriginal Environmental Health Program Science and Policy Unit for checking content validity and real-time trials in communities outside of the Midwest region.

Therefore, Midwest HCAT v2 encompasses additional suggestions made based upon all three trials.

There was opportunity in the follow-up assessment for the Midwest-based Assessors to comment on the user friendliness of the reformatted items within the relevant HCAT domains. Both the Midwest HCAT and HCAT v2 tool were provided to the Assessors in the follow-up assessment. The Assessors

were requested to review both versions of HCAT instruments provided and to complete their preferred version. The process of validating HCAT v2 and the formation of Midwest HCAT is summarised in Figure 1.

2.2.4 Managing Social Desirability Bias

Utilising a small facilitated group ("the Assessors") in the healthy community assessment allowed an opportunity to discuss individual scoring and develop a consensus score for each domain assessed. The baseline scores were not revealed to the Assessors until the follow-up consensus scores were decided to reduce social desirability bias when the group scored the domains.

The group consensus scores with the averages scores from individual Assessors to assess alignment of individual ratings to group ratings were compared. This comparison helped the facilitator to reflect on the degree to which 'quiet voices' may be lost in coming to consensus score.

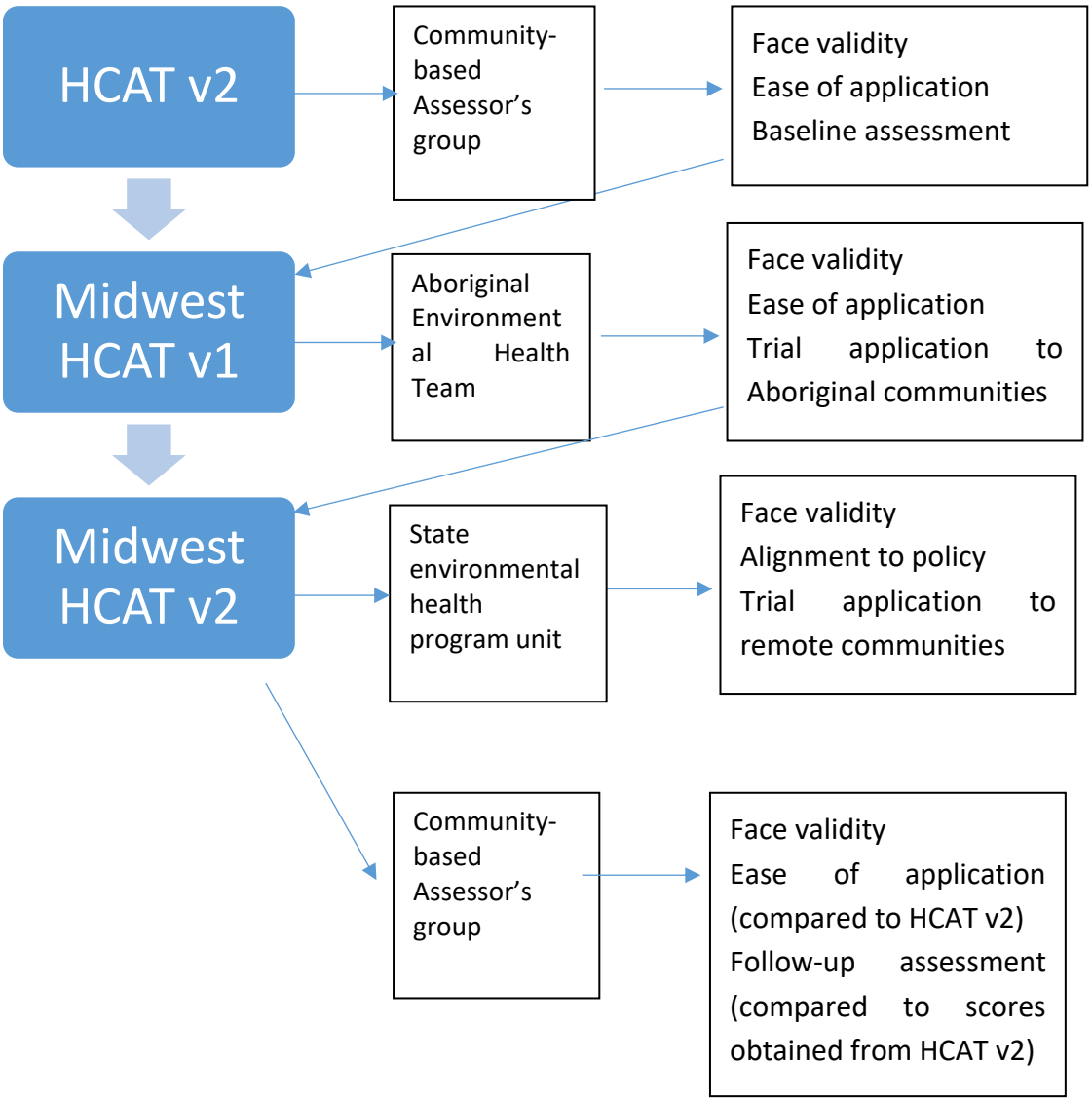

Figure 1. Process of validating the Healthy Community Assessment Tool version 2

2.3 Role of Researchers

The researcher who initiated the research process occupied the role of focus group facilitator to provide 'critical companionship' [12]. The researcher constantly reflected on the risk of the structured tool restricting the scope of the interagency collaborations.

The participants of the study, named 'Assessors' were invited to be co-researchers who critically examined the HCAT and observed the status of the community while performing day to day duties.

This design reflects Tichen's model of facilitation involving the key processes of observing status of the community whilst performing day-to-day duties, listening and questioning their observations, feeding back these observations, and combining challenge and support within a critical dialogue in the Assessor Group [14].

The researchers constantly reflected on the influence of the study process on the identification of collaborative actions and the interpretation of applicability of HCAT constructs in assessing the health of the community.

2.4 Ethics approval and consent to participate

The study was conducted as part of the More Than Talk project and approved by the Western Australian Aboriginal Health Ethics Committee (367-10/11). All participants gave informed voluntary written consent.

2.5 Consent for publication

Consent for publication was obtained through all participating agencies through research participants, and individually from all authors.

3. Results

3.1 Participant Characteristics

In total, 17 participants were included: 10 outer regional community-based Assessors, 5 Aboriginal Environmental Health program staff and 2 State environmental health program staff.

In the Midwest Trial, eight Assessors were involved in both the initial and baseline assessments; however, the health promotion officer was replaced by the officer for Cultural and Development officer at follow-up. There were 3 males and 5 female Assessors in both assessments. One mainstream organisation representative and one participant from the local Aboriginal Community Organisation were Aboriginal; both participants were involved in the baseline and follow-up assessments. Table 1 lists the agencies represented at baseline and follow-up.

Five staff from the regional Aboriginal environmental health program participated in the trial of Midwest HCAT v1 and all of whom were male Aboriginal local residents and work directly with Aboriginal communities in the Midwest region.

Two staff from the State environmental health unit participated in the review of the revised tool, both non-Aboriginal males who regularly visit rural and remote communities in Western Australia.

Table 1: Agencies contributing to HCAT assessment processes

April 2013	August 2015	Same Person
Police	Police	No
Health – health promotion	Position discontinued (Nov 2014)	No
School	School	Yes
Aboriginal community controlled employment organisation	Aboriginal community controlled employment organisation	Yes
Local government (management)	Local government (management)	Yes
Local government (cultural and community development)	Local government (cultural and community development)	Yes + 1 new in 2015
Local government (youth)	Local government (youth)	No
Dept of Child Protection and Family Services	Dept of Child Protection and Family Services	Yes

3.2 Findings from the Trials

The six domains deemed relevant to the serviced town (an outer regional community) by the interagency stakeholders were pest control and animal management; healthy housing; food supply; community vibrancy, pride and safety; reducing environmental tobacco smoke; and promoting physical activity. The Assessors found the content of the descriptors mostly aligned with their community context but found that some of the items associated with healthy housing, food supply and promoting physical activity were difficult to apply. Their feedback on the items tested is summarised below.

3.2.1 Feedback and modifications from Assessors at Baseline

- **Healthy housing**

1. items modified and reformatted

The score for the laundry item (Item 9.4) was low due to absence of a community laundry. As laundry facilities were standard within the residents where people live, the Assessors believed that it was not essential for local residents to have access to a community laundry. The communal laundry facility at the caravan park was adequate to accommodate visitors staying in the community.

The Assessors found that there were multiple components in the laundry rubric making it difficult to draw a line when deciding the item scores. It was suggested that for the laundry item, there should be a weighted listing of criteria allowing individual scoring and the separation of essential and optional criteria. For instance, descriptors on community laundry would be optional in this particular community.

A staff member of the WA Aboriginal Environmental Health Program Science and Policy Unit who participated raised the concern of asbestos containing material (ACM) or inappropriately stored and disposed asbestos waste impacting on indoor air quality. Inhalation of asbestos fibres can cause asbestosis, lung cancer and mesothelioma. In the Midwest HCAT, asbestos waste disposal was added to the outdoor (ambient) air quality. It was also suggested that given the old housing stock in Midwest, asbestos/ACM in residential housing structures should to be considered under healthy housing because of its effect on indoor air quality and for ease of use in identifying, streamlining and prioritising action areas.

As a result, in the Midwest HCAT, Asbestos Containing Material (AMC) used in building was added under *Health Housing* as 9.2, and the laundry component in the original tool was reformatted as a weighted checklist and shifted to 9.4. Community laundry was listed as an optional item in the modified tool.

- **Food supply**

1. difficult to complete
2. further work required

The Assessors found this item difficult to complete. For example, availability of food scored high according to the descriptors; however, as available food is considered expensive, it is not affordable. They also found the items on food safety and promoting healthy eating were difficult to score as the conditions in Midwest did not fit neatly into any one of the boxes.

A further challenge was experienced in distinguishing availability and affordability of healthy food as the participants believed stakeholders believed mere availability would not promote healthy eating unless it was affordable. It was agreed that 'availability of affordable healthy food' should be assessed under one construct. It was also agreed that detailed work was required to work through the difficult-to-score items.

As food supply in the community was exclusively in the domain of private businesses, apart from limited healthy eating initiatives, the interagency stakeholders felt that their capacity to influence healthy food supply was extremely limited. Although food supply stayed as a standing agenda item during the two-year trial period, limited discussion was generated beyond the initial assessment. This item was eventually taken off the agenda but participants agreed to review this item in future.

- **Promoting Physical Activity**

1. inconsistencies in HCAT v2 rectified
2. new item introduced as an alternative option for small remote Aboriginal community without physical activity infrastructure

Participants found it confusing that adults aged ≥65 years were a category on the scoring sheet but were not being identified in the HCAT rubric. Furthermore, in a rural and remote context, particularly in Aboriginal communities, participants felt that the concept of physical activity would be different to the mainstream conceptualisation particularly for Aboriginal people over the age of 45 years, and especially over 50 years.

The MAEHP team participants suggested replacing the checklist of community infrastructure to promote physical activity with four open-ended questions to align with the needs of other remote Aboriginal communities in the region. These questions were

1. What cultural exercises do you do to keep you healthy?
2. What exercise / sporting activities do you do to keep healthy?
3. What exercise / sporting activities would you want to do for your own health?
4. What other activities would make your health better?

Interestingly, when explored with the wider group of the Midwest Assessors, they considered the original physical activity items more relevant to the context of this particular community.

The four open-ended questions were retained as an alternative to the checklists in the Midwest HCAT v2.

- **Community Vibrancy, Pride and Safety**

1. reformatting
2. new constructs added on local governance
3. missing item identified

Similar to the laundry item, the Assessors found items in this domain difficult to score due to the presence of multiple constructs within each cell in the rubric. Reformatting options were suggested and based on the suggestion, the streamlined scoring scale with headings (see Table 4 below) was developed.

'Strong leadership and local coordination possible to create change in the community' was suggested to be pertinent to excellence in community vibrancy. To qualify as good vibrancy, leadership and local coordination make it possible to steer community-based programs. The Assessors felt that when the leadership and local coordination for basic level of service delivery is present. When local coordination of service delivery is not possible, community vibrancy would be poor or very poor. This construct was added to item 11.1 – the vibrancy rubric.

The HCAT did not explicitly cover a critical social determinant of health – participation in education - which the community-based Assessors believed was related to the attainment of community vibrancy and safety outcomes.

Illicit drugs such as marijuana and methamphetamine were also raised by both groups in the Midwest Trials as of high concern to the community, but not issues considered within the HCAT.

3.2.2 Reformatting of HCAT version 2

Modifications made to the HCAT version 2 largely represented reformatting. The participants in the Midwest Assessor group and its use by the Aboriginal Environmental Health program team found scoring the original format difficult as multiple constructs existed within the same box and were considered to have different ratings. The original scoring scales were reformatted to either a streamlined scoring scale, scoring scales with sub-headings, and in the case of laundry a checklist with weighted scales were developed.

The Assessors unanimously preferred the Midwest HCAT v2 at follow-up and felt the newly formatted tool allowed a more fine-grained allocation of scores in each of the descriptor of the tool.

Examples of the scale type in the Midwest HCAT are provided in the supplementary table 1-4, while Table 2 below summarises the modifications for selected items (see Appendix 1 for details of reasons for modification).

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Table 2 Modifications to the HCAT version 2

Items	Midwest HCAT Components	Scale Type in Midwest HCAT	Compare to Menzies HCAT version 2.0
Table 8 Pest Control and Animal Management	8.1 Domestic Pets	Scoring Scale	Identical
	8.2 Livestock	Scoring Scale	Identical
	8.3 Vermin	Scoring Scale	Identical
Table 9 Healthy Housing	9.1 Personal Hygiene	Streamline Scoring Scale with Sub-headings	Reformatted
	9.2 Asbestos Containing Material (ACM) use in Buildings	Scoring Scale	**Moved from construct within 3.2**
	9.3 Healthy Food Storage and Preparation	Streamlined Scoring Scale with Sub-headings	Change to 9.3 The Ability to Safety Store and Prepare Healthy Food
	9.4 Laundry	Check List	9.2 Laundry
Table 10 Food Supply	10.1 Food Outlet Infrastructure	Scoring Scale	Identical
	10.2 Access to Food Outlet	Scoring Scale	Identical
	10.3 Availability of Affordable Healthy Food	Scoring Scale	The word 'affordable' added to qualify healthy food
	10.4 Affordable Healthy Food	Scoring Scale	Identical
	10.5 Food Safety	Scoring Scale	Identical
	10.6 Promoting Healthy Eating	Scoring Scale	Identical
Table 11 Community Vibrancy, Pride and Safety	11.1 Vibrancy	Streamline Scoring Scale with Sub-headings	Reformatted
	11.2 Pride	Streamline Scoring Scale with Sub-headings	Reformatted
	11.3 Safety	Streamline Scoring Scale with Sub-headings	Reformatted
Table 12 Reducing Environmental Tobacco Smoke	12.1 Private Space (eg house, car)	Scoring Scale	Identical
	12.2 Public Space (eg in and around public buildings and facilities (store, health centre, school etc)	Scoring Scale	Identical
Table 13 Promoting Physical Activity	13.1 Children under 5 yrs	Scoring Scale	Identical
	13.2 Physical Activity for 5 to 18 yrs	Scoring Scale	Identical
	13.3 Physical Activity for 18 to 45 yrs	Scoring Scale	Identical
	13.4 Physical Activity for 45 yrs+	Scoring Scale	Identical
	13.5 Gender Equity	Scoring Scale	Identical
	13.6 Facilities to Promote Physical Activity - Please tell us your understanding of the following	A set of four open-ended questions	Provide open-ended question as alternative to Table 14 if checklist considered irrelevant to local community context.

4. Discussion

There are a number of learnings and considerations moving forward from this initial application of the tool in practice.

4.1 Utility of HCAT

The HCAT contains domains assessing environmental health conditions and selected social determinants of health in small communities. Participants in this pilot agreed that using the HCAT to support interagency discussion helped to streamline core business across various public-sector functions and generated 'useful discussions'. Our work provides some evidence that a comprehensive multi-pronged assessment tool such as HCAT can be flexibly applied in partnership with local service providers, validated by local residents, and assist to streamline inter-sectoral actions.

The action learning approach provided a potential method for assessing progress and could support translation of findings into practice. Its utility would be improved if, based on collaborative approaches and agreed actions, there was the potential for pooled funding by which investment could be prioritised and implemented in a staged fashion for locally prioritised achievable actions. By aligning the actions needed at local, state and federal government levels, an agenda set at local level could be supported by coordination of priority initiatives.

A two-year timeframe was sufficient for Midwest-based stakeholders to mobilise available resources and observe reasons for change or lack of change in relation to the HCAT descriptors.

4.2 High Stakeholder Concern but Currently Not Assessed by the HCAT

School attendance was identified by Midwest participants as a key outcome indicator for youth and would require a construct to be created to encourage collaborative dialogues through the ranking process and discussion.

The majority of the constructs in the HCAT represent the minimum standards for environmental conditions conducive to human health, while the domain of community vibrancy, pride and safety should ideally be tailored to the community concerns at baseline. In the example of the present study, school attendance was recognised as a major concern that would benefit from whole of community action.

4.3 Cultural and Remoteness Context of Physical Activity Requires Further Exploration

The rationale for the four open-ended questions MAEHP team participants suggested for the assessment of physical activity infrastructure requirements focused on finding out whether the needs of remote Aboriginal communities in the regions were met. The difference between the MAEHP practitioner's opinion and the opinion of MW assessors may be twofold.

Firstly, and more superficially, is the size of the community. MW is a serviced town with over 700 population while the MAEHP, in making the suggestion, was considering remote Aboriginal community of less than 100 people. It is not feasible to suggest the same physical activity infrastructure should be in place for communities of all sizes across the region.

Secondly and more importantly is the cultural context. The checklist of community infrastructure to promote physical activity lists the infrastructure required to promote physical activity. While the approach suggested by the MAEHP may be more culturally appropriate by understanding the physical activity needs of the community and with reference to culturally appropriate exercise, the infrastructure assessed by the HCAT was readily available in the MW community. However, it was questioned as to whether they

are utilised, pointing to the need for further work on assessing the appropriateness of such infrastructure in meeting the physical activity needs of Aboriginal communities and that infrastructure alone is insufficient to encourage physical activity.

4.4 Social Desirability Bias is Unavoidable in Co-construction Projects

Detailed analysis of comparison between the group consensus scores and the averages scores from individual Assessors triggered reflections on interagency dynamics during the research process. For example, the Assessors who recently relocated to the community had very different perceptions and or assessments on the same domain.

As the purpose of this paper is to report on the mechanics of how the HCAT was applied and adapted rather than the findings from the assessment, in-depth analysis on the impact of social desirability has been considered out of the scope in the present discussion. However, the considerable disparity in socioeconomic circumstances in residents of the town impacts on individual's perspectives on community functioning and should be noted in future application and interpretation of findings from the HCAT.

A further source of unavoidable social desirability bias in Tichen's model of facilitation comes from the tendency that people who initiate and are part of actions are more likely to observe positive outcomes from that particular action. This said, the HCAT facilitated focus groups were opportunities for the interagency stakeholders to reflect in a structured way on the progress towards the goals they set out to achieve at baseline. Much of the discussion related to the complex interaction between State-Commonwealth policy, funding and service delivery and structure changes, and how they impact on the domains discussed in this paper. In short, the scope of influence the local service providers had were, to an extent, dependent on policy and funding decisions made outside of this community. In the case of healthy housing, the local service providers have greater scope of influence on the conditions of available housing stock, so more actions were possible and therefore positive outcomes observed. A community-wide healthy food initiative created community dialogue but made little impact on the food stock available due to private business viability considerations. The involvement of multiple agencies and their deliberative efforts to engage with community residents may have occurred to help provide a balanced perspective on issues raised in the assessment, although the extent to which this occurred cannot be ascertained.

5. Conclusions

The face validity of HCAT items were confirmed in this research with adjustment of a few items in healthy housing, food supply and physical activity domains to reflect the local context in the formation of Midwest HCAT. The majority of the adjustments involved reformatting to allow precision in scoring across the rubric and to reduce confusion created by longer, less clearly demarcated descriptors.

Use of the HCAT domains helped support streamlining the agenda to cover core business in the local community and was key to the meaningful engagement of interagency stakeholders. The benefits of co-constructing and using action learning methods to engage local service providers throughout the research process must be balanced with the unavoidable risk of social desirability bias in the healthy community assessment. Whilst the scores allocated to HCAT items provided reasonable benchmark to how community has progressed toward agreed outcomes, the collaborative reflections generated was perhaps more meaningful to community-based stakeholders who work and live with the HCAT descriptors in real time.

Supplementary Materials: The following are available online at www.mdpi.com/link,

Figure 1. Process of validating the Healthy Community Assessment Tool version 2

Table 1. Agencies contributing to HCAT assessment processes

Table 2. Modifications to the HCAT version 2

Appendix 1. The Healthy Community Assessment Tool version Midwest (MW CAT) – explanatory notes

Supplementary Table 1. Scoring Scale (identical to the original HCAT)

Supplementary Table 2. Streamlined Scoring Scale

Supplementary Table 3. Streamlined Scoring Scale with Sub-headings

Supplementary Table 4. Check List

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- Midwest Economic and Employment Aboriginal Corporation
- Mullewa District High School
- Department of Child Protection and Family Support Mullewa District Office
- Department of Health Western Australia
- Bundiyarra Environmental Health Program
- Mullewa Police
- Western Australian Centre for Rural Health

Author Contributions: Christina Tsou facilitated the focus group discussions, collected and analysed data, and prepared the first and final draft of this publication. Gordon Gray and Charmaine Green provided local Aboriginal community perspective throughout the research process and conception of the paper. Sandra Thompson provided methodological supervision, provided expert advice and supported the conceptualisation, structuring and editing of this publication.

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Appendix A. The Healthy Community Assessment Tool version Midwest (MW CAT) – explanatory notes

The Western Australia Centre for Rural Health (at the time of data collection the Combined Universities Centre for Rural Health) conducted the WA pilot of the original Menzies HCAT first took place in Mullewa with six interagency stakeholders who examined the face validity and suggested adjustments to wording and formats of the items used (the last six items from the original tool). This initial WA Trial took place as part of 'Building the Mullewa Model' case study.

Based on the feedback from the Mullewa Trial, the full tool was examined in detail and where required components were reformatted.

The original and reformatted components were trialed with Environmental Health Practitioners of different levels of EH Experience in the Midwest Aboriginal Environmental Health Program (MAEHP) to test for relevance of HCAT constructs to Environmental Health practice in Aboriginal Communities in the Midwest.(The Bundiyarra Trial). MAEHP team members have provided valuable feedback based on their practical experience and revisions made accordingly to form The Healthy Community Assessment Tool Midwest version 1 or The Midwest Healthy Community Assessment Tool version 1 (MW HCAT v1). ***Added constructs are bold and italicized.***

MW HCAT v1 was taken to remote Aboriginal communities in Midwest and Kimberley respectively by the Senior Program Officer and Program Manager, *WA Aboriginal Environmental Health Program Science & Policy Unit* for real time trials. MW HCAT v2 encompasses suggestions provided from these trials and the second Bundiyarra Trial.

The MW HCAT case study is funded by Healthway through the More Than Talk research translation into practice grant.

HCAT Item Brief

1.0 Water Supply

The objective of a water supply system is to provide adequate water that is suitable and safe for a variety of uses (including for consumption, domestic needs, personal hygiene, bathing and food preparation) in the community. A system includes storage and treatment facilities and the distribution system. The quantity of the water available and the microbiological, chemical and radiological aspects and other disease-causing agents that can affect water are of major importance to health outcomes.

Drinking water quality is measured against Australian Drinking Water Guidelines (ADWG) values for physical, chemical, microbiological characteristics. The volume of water required by a community is measured against ADWG for quantity (that is, 1000-1200 litres per person per day).

To help assess your community's water needs refer to the NHMRC *Community Water Planner – A tool for small communities to develop drinking water management plans* to assess their community's water supply needs and develop a water management plan.

2.0 Sewerage System

The objective of a sewerage system is to transport sewerage or effluent from properties to the treatment plant for treatment and final disposal, addressing public health and environmental concerns and in accordance with current legislation.

A sewerage system is usually a network of pipes through which sewage is transported to a centralised sewage treatment plant. Here, primary treatment (screening, grit removal, primary settling), secondary/biological treatment (aerobic oxidation, settling) and tertiary treatment (nitrification) takes place. Remote Indigenous communities and small rural towns may have septic tanks with on-site effluent disposal (e.g. soakage trenches, leach drains or wells) on individual properties, septic tank effluent disposal (STED) systems (where primary treatment takes place in septic tanks on individual properties and septic tank effluent is then collected through a network of pipes and treated centrally) or may have a fully reticulated sewerage system.

Final effluent disposal is disposal of the treated wastewater through evaporation, discharge or reuse (such as irrigation). Excellent final effluent disposal is via reuse, with no contamination of water supplies or the natural environment, and all health department and environmental requirements are met.

3.0 Air Quality

Polluting emissions that reduce the air quality generally occur from 3 sectors: transport, residential and industry. Residential sources include heating with wood, backyard burning and domestic appliances. In rural and remote areas the smoke from burning garden waste or household refuse, back burning and wild bush fires can cause some people to have serious respiratory problems.

Air pollution occurs when the air contains gases, fumes or odour in harmful amounts (that is, amounts which could be harmful to health or comfort of animals or which could cause damage to plants and materials). Pollutants can include carbon monoxide from car exhausts, pesticides used in aerial weed control and sulphur dioxide from combustion of coal. There are also natural sources such as windblown dust and smoke from bush fires.

Indoor air is air within a building that occupied for at least one hour a day including the office, classroom, home and store. Indoor air quality can be defined as the totality of attributes of indoor air that affect a person's health and wellbeing. Sources of indoor air pollution include tobacco smoke, gas cookers, unflued gas heaters, fungi, microbial contamination, house dust mites, particulates and air toxins such as formaldehyde.

Asbestos containing material (ACM) or inappropriately stored and disposed asbestos waste is of concern to indoor air quality. Inhalation of asbestos fibres can cause asbestosis, lung cancer and mesothelioma. There are two main types of asbestos, 'friable' or 'non-friable'. Friable asbestos can be easily crumbled, pulverised or reduced to powder by hand pressure when dry. 'Non-friable asbestos is any ACM other than friable asbestos these include, but not limited to, asbestos cement building products, vinyl floor tiles, friction materials, and any product where the asbestos is locked into the matrix. In the Midwest HCAT, asbestos waste disposal is added to the outdoor (ambient) air quality, while Asbestos or ACM in residential housing structures influencing indoor air quality is moved to healthy housing for ease of use in identifying, streamlining and prioritising action areas.

4.0 Public Toilets

A public toilet is a toilet that the general public has free access to, regardless of payment/non-payment. The general public is free to access the toilet without having to be a resident or have some other link to the community.

A good public toilet design takes into account visibility, access, natural light, proximity to other facilities, building design and orientation, landscaping, building materials and finishes, management, maintenance and security.

Public toilets are crucial infrastructure necessary for the physical comfort and social well-being and practical operation of a functioning community. The provision of public toilets has implications for public and individual health, transport, crime prevention, urban design, economic and cultural development and social equity.

As a guide, public toilets should be available whenever approximately 100 patrons or spectators normally attend an activity centre, while a reduced number applies at other places where people gather, for example, when public barbeque facilities are a focal point for people to gather.

5.0 Solid Waste Disposal

Regular organised rubbish disposal is an important factor in community health. It can prevent chemical and food poisoning, physical trauma from sharp and insecure objects and infectious diseases caused by vermin and insects.

Solid waste is produced by all sectors of society and includes household waste such as garbage and garden clippings, other waste such as street bins and street sweepings and wastes from retail, commercial and industrial activities. Putrescible materials comprise the largest proportion of municipal waste, with paper/wood products, glass, metals and plastics constituting a significant proportion. Solid waste may be disposed by recycling, composting, incineration, landfill and on-site landfill. Solid waste management is an environmental problem with implications for land, water and air quality, environmental health and land use.

Here we refer to the delivery system as the processes that occur from house to tip, including waste collection vehicle(s), waste transfer stations and landfill site, also the level of services provided to households and public areas.

6.0 Community Drainage, Roads and Footpaths

Flooding has been described as situations in which 'watercourses overflow and inundate either part or all sections of the community'. Ponding has been described as the formation of 'pools of still water that remain stagnant for a period of one week or more and cover an area of at least 10 square metres'. Flooding and ponding can result from rain events and other surface runoff. It can result in problems for the community including sanitation system failures, damaged electricity supplies, excessive mould growth, inaccessible roads and breeding of disease carrying mosquitoes. Risks to human health include an increased risk of death and injury, faecal-oral transmitted disease, vector borne disease, rodent borne disease and mental health problems. Contact with flood water should be minimised (including preventing children from playing in floodwater) in order to avoid waterborne illness such as diarrhoeal disease.

Risk factors specific to rural and remote Australian roads include: greater distances travelled, higher speed limits, poorer road quality and unsealed roads, increased diversity in types of vehicles, and delays in retrieval and accessing medical treatment and rehabilitation. There is a lower risk of collision with other vehicles but higher risk of collision with livestock and wildlife. Police enforcement of speed limits, alcohol use and seatbelt wearing has been found to be less on rural roads than in urban areas. Safe roads require traffic management, signs and markings, maintenance and pedestrian and bicycle safety features to ensure risk of injury is minimised. The road surface is vital for road safety as it helps vehicle tyres grip the road. Dust from unsealed roads and other community areas can affect health and increase wear and tear on vehicles and equipment.

Footpaths are public spaces. Well designed and maintained footpaths provide safe walking and access conditions and promote the use of public spaces and physical activity. Their primary role is to provide

access for all people to move about with safely and without obstruction. The availability of footpaths on streets where children live can reduce levels of child pedestrian trauma. Smooth footpath surfaces ease wheelchair travel, aid parents with prams, and assist people using walking frames. The provision of tactile sections of the footpaths will assist people who are vision impaired.

An additional component, 6.4, on Flood Protection has been suggested by the Midwest Aboriginal Environmental Health Practitioners to specify and reinforce the importance of embankment in flood prone communities.

7.0 Electricity Supply System

The term electrical power supplies include the power distribution system as well as the primary or secondary sources, including conversion, batteries, chemical fuel cells, wind and solar power and generators.

Access to electricity and gas allows for the operation of health-related infrastructure, such as lighting, heating and cooling, water heating, refrigeration of foods, power supply for kitchen appliances, communication, education and the use of other electrical equipment. The electricity supply is required to be consistent in the voltage of power delivered so as not to damage essential household items such as refrigerators.

Some communities may not have access to an organised electricity supply and where a supply is provided, not all houses may be connected. The cost of electricity may prohibit householders having a continuous supply of electricity, especially in communities where the majority of community members have low levels of income. In this situation problems may arise as it concerns storing food safely, doing laundry and in some contexts maintaining good personal hygiene.

8.0 Pest Control and Animal Management

Pest control is the reduction or regulation of the population of noxious, destructive or dangerous insects or other animals through various means, including chemical and biological processes. Vermin refers to various small animals or insects, such as rats or cockroaches that are destructive, annoying or injurious to health.

Animal management can be defined as the act, manner or practice of managing; handling or control of animals.

Good animal management practice aims to promote and facilitate responsible ownership of dogs and cats, animal welfare and the benefits of owning a companion animal. It aims to reduce the risks posed to human health from animals including disease and injury. Strategies to manage domestic animals include their identification and registration; collecting and impounding stray animals; promoting the health and welfare of animals; restricting the number and type of animals in a community; and taking action against dangerous or diseased animals. Animal Management Acts or Model Codes of Practice exist in many States to guide animal management planning, monitoring and action.

The term domestic animal refers to domesticated animals that live in physical proximity to humans, such as cats and dogs (pets) and guard animals or even food species (pigs) kept very close, for example, to live on domestic food scraps and/or their body heat can be used as ‘stable heating’. In some communities, native animals such as kangaroos are reared and kept as domestic pets.

Livestock refers to domestic animals (such as chickens, pigs, horses, cattle) intentionally reared in an agricultural setting to produce food or fibre, or for its labour.

Vermin refers to small animals, insects and mites that have the potential to spread disease or cause injury to humans and/or cause damage to infrastructure, for example, cockroaches, rats, mice, fleas and scabies.

A holistic approach to animal management in remote Indigenous communities recognises cultural and spiritual aspects, the Indigenous perspective that dogs are integral to the fabric of remote communities, and that the health of the dogs is intrinsically linked to the health and well-being of the community.

9.0 Healthy Housing

Poor housing and poor living conditions promote the spread of infectious diseases and place at risk the social and emotional wellbeing of those who live in the house and the wider community.

Health hardware is the term used to describe the physical equipment necessary for healthy, hygienic living. The equipment must have design and installation characteristics that allow it to function and to maintain or improve health status, e.g. to be able to wash there needs to be a reliable supply and sufficient quantity of water available, efficient and functional plumbing systems at community and household levels, while items such as the shower rose, taps and drain need to be of appropriate technology and functional. Only some key aspects of housing that directly impact on preventing infections are included here.

In the Midwest HCAT, Asbestos Containing Material (AMC) use in Building has been added to this item as 9.2 and the laundry component in the original tool reformatted and shifted to 9.4.

10.0 Food Supply

Food and nutrition are important aspects of health and wellbeing. Poor nutrition due to insufficient, low quality or unreliable food intake leads to ill health. It also contributes to existing inequities in health because inadequate or poor-quality food intakes are most commonly experienced by people with the worst social and economic status and other forms of individual or environmental disadvantage. In remote and rural areas, food and nutrition must be viewed in the context of the food supply, its availability, freshness, cleanliness and year-round variety. The term 'food supply' is used in this report to refer to those aspects of the supply of food in a community that affect the food security of individuals, households or an entire population. These aspects of the food supply include the location of food outlets (retail and prepared foods) within a community; the availability of food within those stores; the price, quality and variety of the food that is available; management of the store; and the way that different foods are identified and promoted

The term food security refers to the ability of individuals, households and communities to acquire appropriate and nutritious food on a regular and reliable basis using socially acceptable means. Food security is determined by the food available in a community (food outlet, market garden, home grown, proximity to a major centre) and whether people have adequate resources and the skills needed to acquire and use (access) that food. People who are socio-economically disadvantaged experience food insecurity, for example, the unemployed, low wage earners, single mothers and in some Indigenous communities.

The term food outlet includes shops such as supermarkets that sell food that generally needs to be prepared and 'take-away' stores that largely sell pre-cooked or pre-prepared food.

In MW HCAT, 'availability of healthy food' is replaced by 'availability of affordable healthy food' because the Mullewa based stakeholders believed merely availability does not promote healthy eating unless it is affordable.

11.0 Community Vibrancy, Pride and Safety

Community vibrancy, pride and safety are linked to increased physical and mental health, sporting and academic achievement, local economic development, and lower rates of homicide, suicide, and substance abuse. The vibrancy, pride, feel and safety of a community can also have economic and environmental benefits. Communities that are well maintained and appealing increase property values attract tourism and promote retail sales.

Vibrancy refers to the opportunities within the community for cultural and artistic expression and participation and for cultural values to be expressed through the arts, promoting a culturally relevant visual and auditory environment. Arts and culture in a community relate to health and safety outcomes because they promote healing, physical activity, social connections and community engagement. Artistic outlets such as gardens, murals and music support a healing environment. Artistic expression, such as dance, can encourage physical activity and create environments that engage youth, resulting in positive behaviour outcomes.

Pride has been defined as a sense of one's own worth. Community pride builds the community's identity, self-esteem and self-respect, and ultimately builds the community itself. A welcoming, well-maintained, clean and culturally appropriate appearance of a community can encourage people to go out, fostering social connections and encouraging physical activity.

The feel and safety of a community relates to health and safety outcomes because it can affect people's willingness and ability to engage in physical activity, interact socially, and reinvest in their community. The feel and safety can contribute to a general increase in community networks and trust by creating a community feel through which people are encouraged to interact with each other in a safe environment.

The MAEHP staff members have experienced firsthand the importance of leadership and local coordination to the successful delivery of environmental health program to remote and rural Aboriginal communities. To capture this in the assessment, an additional construct is added to component 11.1 under the sub-heading of Local Governance.

12.0 Reducing Environmental Tobacco Smoke

Second-hand cigarette smoke has been linked with a range of serious and life-threatening health impacts including heart disease, cancer, asthma and other respiratory problems. While most evidence relates to indoor exposure, there is emerging evidence on how smoking affects air quality in outdoor locations such as playgrounds.

Children exposed to second-hand smoke are at an increased risk of asthma, sudden infant death syndrome (SIDS), acute respiratory infection and ear problems.

Smoking bans support smokers to reduce cigarette consumption and increase rates of quitting.

Although inhaled illicit drugs such as Marijuana, Gunja are raised by both groups involved in the Midwest Trials, it is considered a separate issue to tobacco smoke.

13.0 Promoting Physical Activity

Two types of physical activity are discussed here:

- Incidental exercise. This is the movement people perform when undertaking daily activities, such as walking/cycling to work or walking the dog. Incidental exercise is

promoted by the presence of footpaths, cycle paths, etc.
- Structured exercise. This is planned and organised physical activity such as playing sport, weight training or attending aerobics classes.

Opportunities for both incidental and structured exercise should be available and promoted in a community.

Healthy eating and physical activity are the cornerstones of good health and are particularly important for the healthy growth and development in children. Engaging regularly in moderate to large amounts of physical activity is seen to be protective against unhealthy weight gain that can lead to developing chronic disease in adulthood. Regular physical activity, active play and sports can be a practical means to achieving numerous health gains, either directly or indirectly, though its positive impact on other major risks, in particular high blood pressure, high cholesterol and obesity. In addition, it promotes general psychosocial well-being, reduces stress, anxiety and depression, improves bone health and helps control weight gain. Low levels of physical activity during childhood have been linked with risk factors for cardiovascular disease and diabetes in adulthood. Those engaged in sedentary occupations and inactive recreations, such as watching television, are at high risk of unhealthy weight gain.

Engaging in regular physical activity offers benefits across all age ranges. Physical activity is important for healthy aging, improving and maintaining quality of life and promoting and maintaining independence. Children and young people, women, the elderly and people with disabilities have varying exercise needs. For the general adult population, the greatest health benefit is gained by performing at least 30 minutes of cumulative moderate physical activity every day (or at least 5 days per week). This level of activity can be reached through a broad range of appropriate and enjoyable physical activities in people's daily lives, such as walking to work, climbing stairs, gardening, dancing, as well as a variety of other leisure and recreational sports.

Children need a minimum of 60 minutes of moderate to vigorous physical activity every day. Television viewing of more than two hours a day in childhood and adolescence is associated with poor fitness, smoking, raised cholesterol and being overweight in adulthood. Physical activity is very important for children between 5 and 12 years of age. It benefits them by promoting healthy growth and development; build strong bones and muscles; improve balance and other skills; maintain and develop flexibility; help achieve and maintain a healthy weight; improve cardiovascular fitness; help relaxation; improve posture; provide opportunities to develop friendships; and improve self-esteem. As important, it promotes the healthy habit of regularly engaging in physical activity to carry throughout life.

The Check list of community infrastructure to promote physical activity is replaced by four open-ended questions to suit the needs of the Aboriginal communities in this region at this stage of their development.

Supplementary Table 1: Scoring Scale (identical to the original HCAT)

Scores for Domestic Pets	VERY POOR		POOR			SATISFACTORY			GOOD			EXCELLENT
	0	1	2	3	4	5	6	7	8	9	10	11
8.1 Domestic Pets	Uncontrolled breeding and large numbers of unwanted animals present. Damage to infrastructure and mess due to scavenging. Excessive noise from barking dogs. Dog faeces contaminate the environment. Regular complaints of dog bite. Community members feel unsafe walking in the community due to aggressive dogs.		Animal management strategy consists of the periodic culling of domestic animals.			Although in large numbers, pets are in a healthy condition and pose no threat to humans through disease or injury. Most animals are contained and few roam the community at large. Attempts made to restricted animals breeding. Complaints of dog bite infrequent.			Conditions apply as for 'satisfactory'. Animal management programs and systems are in place, e.g. registration and desexing. Community members feel they can safely walk about in the community.			Conditions met as for 'good'. In addition, a documented animal management plan is available and has been implemented. Progress towards achieving the objectives of the plan is monitored.
Comments:									**Your Score for Domestic Pets Management**			

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Supplementary Table 2: Streamlined Scoring Scale

Scores for Customer Satisfaction	VERY POOR		POOR			SATISFACTORY			GOOD			EXCELLENT
	0	1	2	3	4	5	6	7	8	9	10	11
1.4 Customer Satisfaction	The water is considered unpalatable and unsafe.		Sometimes the water is unpalatable.			The water is generally palatable and considered to be healthy and safe.			The water is considered palatable, healthy and clean.			Community members consider the water to be very pure and healthy and superior in taste to other water supplies.
	Rarely do community members drink water from the tap or other fixtures.		On occasion there is damage caused to fixtures or the water is discoloured.									
	Regular complaints are experienced.		Regular complaints are experienced.			Individual complaints from time to time.			No complaints.			No complaints.
Comments:											Your Score for Customer Satisfaction	

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Supplementary Table 3: Streamlined Scoring Scale with Sub-headings

11.3 Safety	Very poor		Poor			Satisfactory			Good			Excellent
	0	1	2	3	4	5	6	7	8	9	10	11
Actual and perceived personal and property safety	Extremely poor levels; high crime rates		Sections of the community report concerns; moderate to high crime rates			Satisfactory levels			Community members perceive little threat from crime			High levels of perceived and actual safety
						Crime rates reflect that of wider community			Crime rates reflect that of wider community			Crime rates reflect that of wider community
Rates of substance abuse and antisocial behaviour	High		High in some sections of community			-			-			-
Neighbourhood Watch or similar organisations	-		-			In place			working effectively			working effectively
Police Services	-		-			Regular visiting police service with satisfactory response times.			Short resonse times less than an hour (less than an hour) and easy to access.			Emergency disaster management plan in place
Comments:									**Your Score for Community Safety**			

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Supplementary Table 4: Check List

9.4 LAUNDRY	Please tick the box that best applies to your community		Comments
FUNCTIONAL WASHING MACHINES AND CLOTHES LINES	Little/ no houses have them	0	
	Few houses have them	0.75	
	Several houses have them	1.5	
	Most houses have them	2.25	
	All houses have them	3.5	
AVAILABLE SHELF/ STORAGE FACILITIES IN LAUNDRIES	Little/ no houses have them	0	
	Few houses have them	0.75	
	Several houses have them	1.5	
	Most houses have them	2.25	
	All houses have them	3.5	
HYGIENE EDUCATION	None provided	0	
	Provided on a one-to-one basis only	1	
	Provided at the community level	2	
	Hygiene promoted on a number of levels in the community via a number of different means. e.g. school programs, social marketing etc.	4	**Score Key** Very Poor 0-1 Poor 2-4 Satisfactory 5-7 Good 8-10 Excellent 11
OPTIONAL-COMMUNITY LAUNDRY	Unaffordable community laundry available that is not within easy walking distance from all houses	0	
	Affordable community laundry available, but not within easy walking distance from all houses	0.5	
	Affordable community laundry available, within easy walking distance from all houses	1.5	**Your Score for Laundry**
	Affordable, functioning community laundry available, within easy walking distance from all houses	2	

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