Education resources in remote Australian Indigenous community dog health programs: a comparison of community and extra-community-produced resources

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SUMMARY
Commercial dog health programs in Australian Indigenous communities are a relatively recent occurrence. Health promotion for these programs is an even more recent development, and lacks data on effective practices. This paper analyses 38 resources created by veterinary-community partnerships in Indigenous communities, to 71 resources available through local veterinary service providers. On average, community-produced resources used significantly more of the resource area as image, more imagery as communicative rather than decorative images, larger fonts and smaller segments of text and used images of people with a range of skin tones. As well as informal registers of Standard Australian English, community-produced resources used Aboriginal English and/or Creole languages in their text, while extra-community (EC)-produced resources did not. The text of EC resources had Flesh–Kincaid reading grade levels that excluded a large proportion of community recipients. Also, they did not cover some topics of importance in communities, used academic, formal and technical language, and did not depict people of a representative range of skin tones. As such, community-produced resources were more relevant to the unique situations in remote communities, while EC resources were often inappropriate and in some cases could even distance recipients by using inappropriate language, formats and imagery.

Key words: community health promotion; health communication; Indigenous health; dog; community development

INTRODUCTION
Education and health
Worldwide, there is increasing focus on companion animal health in developing contexts, both to address human health issues such as dog bites/rabies, as well as animal-specific health and welfare concerns. Dog health programs in Australian Indigenous communities are a relatively recent occurrence, beginning from the 1980's. Health promotion for these programs is an even more recent development, and lacks data on effective practices. Communication and education play crucial roles in both animal and human health programs, especially in a cross-cultural context.

In the remote Australian Indigenous context, traditionally, the lives of people and animals are interconnected. Verbal, visual and observational sources of information were available in the community to advise on health matters, such as collection, preparation and administration of medicines, ceremonial responsibilities and so
forth (Trudgen, 2003). Since colonization, the health environment has undergone rapid change, and health issues are now a product of the interaction between Indigenous and introduced pathogens, living styles and treatments, for people just as for their companion animals. Sharing of knowledge about these issues has not reflected the considerable change in living conditions. As MacLennan and Khavarpour (MacLennan and Khavarpour, 2004) note: ‘There is increasing recognition of the need for greater understanding of Indigenous health needs and means by which to deal with them’ (MacLennan and Khavarpour, 2004, p. 237). This is equally applicable to dog health as it is to human health.

Community members are aware of this deficit and have asked not just for veterinary services such as desexing, humane euthanasia and disease control, but also thorough health education (Donohue et al., 2000; Constable et al., 2008).

In suburban settings, much education in this area occurs in the veterinarian’s consultation room, and with the aid of pre-formed resources, and with newer kinds of communication such as television programs, internet sites and school education programs (Hindle, 1992). However, this has mostly been developed for a suburban Euro-Australian audience, and may not be applicable in other settings.

Human health education in indigenous communities

Experiences in the human health and education sectors have emphasized that Indigenous community health can be improved if health education programs are delivered appropriately, addressing cross-cultural issues, and issues of local relevance, community involvement and development (Golds et al., 1997; Eckermann et al., 1998; Heil, 2008). In particular, educational techniques based solely on Euro-Australian cultural tradition had meager success, compared with those generated from the community’s own values, concerns and processes (Keeffe, 1992; Leggatt, 2002). Further, imposing Western culture can challenge the cultural life of the community, creating conflict and weakening the community’s independence and self-determination (Wilkinson and Sidel, 1991; Trudgen, 2003). Extra-community initiatives often use a deficit model of understanding health systems, focusing on deficiencies. While it is important to address deficits, focusing exclusively on them can be damaging by reinforcing stereotypes, creating fear, and reinforcing shame and apathy (Pyett et al., 2008). In order to operate effectively, veterinary education programs, just like human health education programs, are likely to need to build on culturally specific knowledge bases, and utilize local learning processes to ensure the information is relevant and comprehensible.

However, while theoretically pertinent, no research has been conducted on applying these recommendations to the veterinary sphere, and no attempt at quantitative guidelines has been published. This is important because one person’s interpretation of ‘highly visual’ may differ from another’s, as was found in the pilot program to this study (Dixon et al., 2007).

Background to this study

In order to further knowledge about dog health processes in Indigenous communities, the Healthy Dogs Healthy Communities (HDHC) program was created, funded by an Australian Research Council (ARC) Linkage grant and coordinated through the University of Sydney. This program initially undertook needs analysis and dog health surveys in six Indigenous communities. Findings showed lack of knowledge sharing, and lack of engagement between service providers, organizers and the community, as well as lack of access to veterinary services, to be major factors in dog health issues (Constable et al., 2008). Local teams were then formulated, consisting of at least one veterinarian with tertiary qualifications in Indigenous education, and three to seven Indigenous community members. Indigenous team members sometimes had previous training in environmental and companion animal health; others did not. All team members were versed in the previous findings of the study, especially in terms of community concerns and dog health issues, in order to have a common information base. The team then discussed and acted upon the best ways of sharing this information with the rest of the community, which included the production of several resources (Constable et al., 2012a).

The purpose of this paper is to analyse the resultant resources and compare them with the resources available through the veterinary service provider [termed extra-community (EC)
resources]. A further paper will examine the impact of the resources in the community (Constable et al., 2012b).

METHODS

Resources studied

Community-produced resources

Eight information sheets, 4 pamphlets and 26 poster paintings were created in four Indigenous communities.

EC resources

Five servicing veterinary clinics provided 10 posters, 19 information sheets and 59 pamphlets. Seventeen of the pamphlets duplicated those collected at other veterinary clinics, and were discounted. This left 42 unique pamphlets for analysis.

Resource analysis

Community-produced resources and EC veterinary education resources were analysed for format, topics, text and image use, image content, colour use and language.

Format

To examine differences in format, three measurements were taken for each resource. First, the number of pages in each resource was counted. Secondly, the maximum font height of the main body text was measured in millimetres. Thirdly, for resources with text in sentence format, the number of words in the first 15 lines of main body text were counted and averaged for each resource to calculate the average number of words per line. The first 15 lines were used rather than a random selection of lines, because it is the first lines of a resource that the reader notes and engages with first, and are hence the most important in the impact of that resource. The presence of photo and/or other imagery was also noted.

Topics

Pre-requisites for learning in any culture, including Indigenous cultures, include that the learning topic is of relevance and interest to the learner (Gray, 1990). As such, the topics covered in each resource were listed and compared.

Colour use

O’Connor et al. (O’Connor et al., 1999) noted the importance of colour in Indigenous health resources. Therefore, colour use was investigated in the resources, as follows. The number of visually distinguishable colours, other than white, used in each resource was counted up to 12 (dark red, bright red, dark pink, light pink, dark orange, light orange, dark yellow, light yellow, white, light green, dark green, light blue, dark blue, light purple, dark purple, light brown, dark brown, light grey, dark grey and black). The number of colours used in text and background was also noted.

Text and image use

Hughes et al. (Hughes et al., 2004) noted that visual learning was more likely to be an important Indigenous learning style. Therefore, the total and relative importance of text versus image was examined, as follows. The percent of area of each resource page that was covered by text was measured in centimetres, summed and expressed as a percentage of total resource area. Likewise, the percent of each resource page that was covered by imagery was measured, summed and expressed as a percentage of total resource area. The two resultant total resource percentages were then used to calculate the text-to-image ratio.

The area of imagery used to convey the messages of the resource were discerned from purely decorative imagery, and divided by the total area covered by imagery, to calculate the percent of communicative image area. This was then used with the percent image area to calculate the percent of communicative imagery in the total visual field.

Image content

Apart from the style of the resource, content of images can be an issue of cultural safety (Williams, 1999). Images that deny a person’s identity can alienate them from the resource, making them feel that the topic is not relevant to them, or even exclude them. Whether a recipient identifies or is alienated by a particular resource is best determined through interview. However, such a level of analysis was not possible for this study. Despite being complex and
difficult to ascertain objectively and quantitatively, the issue was considered too important to neglect. Thus, the resources were assessed for depictions of people of various skin tones as an index to cultural safety.

We acknowledge that Aboriginality is based on descent, personal identification and peer group recognition, not on skin colour. Nevertheless, there exists a range of skin colours within most Aboriginal communities. Further, as sometimes the only human element visible in an image was a hand, skin colour was the lowest common denominator to assess this issue.

Thus, depictions of people (or parts thereof) in each resource were noted and classified according to skin tone as either pale skinned, indeterminate (i.e. could be a tanned pale skin or a pale dark skin), or dark skinned.

Language
Respondents in Sutherland and Billimoria (Sutherland and Billimoria, 2011)’s study of incontinence pamphlets in Indigenous communities emphasized the need to ‘use direct, everyday language to avoid confusion or misunderstanding’ (Sutherland and Billimoria, 2011, p. 6). In most Indigenous communities, the mother tongue is not Standard Australian English (SAE), but either Aboriginal English, a Creole, or an Indigenous language (Eades, 1992; Harkin, 1994). The languages and registers of the texts were therefore analysed.

As a quantitative guide to language differences, three measurements were taken:

(i) The number of letters of the first 15 words of the main body text were averaged for each resource, in order to calculate the average number of letters per word.

(ii) The number of words of the first 10 sentences were averaged for each resource, to calculate the average number of words per sentence. The first words and sentences were used rather than a random selection, because it is the first components of a resource that the reader notes and engages with first, and are hence the most important in the impact of that resource.

(iii) The Flesh–Kincaide grade level was calculated on the first 10 lines of the resource that used full sentences.

Further, the text of each resource was read to identify the languages used therein, in terms of Formal or Informal registers of SAE, Aboriginal English and/or Creoles. Academic and technical language was also noted. Clear examples of each were noted for illustrative purposes.

Posters were not included in this because their predominantly visual nature meant there was not enough text to conduct a valid analysis.

Statistical analysis
Genstat 12th ed and Microsoft Excel 2007’s students t-test modification for unequal variances and \( \chi^2 \) tests were used to compare between groups of continuous and categorical data, respectively. The cut-off level for significance was 0.05.

RESULTS
Format
Communities produced more single-page resources than paginated resources such as pamphlets or booklets, whereas veterinary clinics tended to produce information sheets, and companies produced pamphlets. By definition, posters in both categories were a single page.

Information sheets consisted of one or two unfolded pages in both groups. Veterinary resources had a preference for using two sheets more often than one, and thus had a significantly higher average number of pages than community-produced information sheets \( (P = 5.9 \times 10^{-4}) \). In the pamphlets too, EC pamphlets had on average a significantly higher number of pages than community-produced pamphlets \( (P = 7.8 \times 10^{-7}) \).

Font heights used in EC information sheets were significantly smaller than community-produced equivalents \( (P = 8.5 \times 10^{-4}) \). Likewise, EC pamphlets had significantly smaller average font sizes that the community-produced pamphlets \( (P = 0.03) \).

Community resources tended to break text up into phrases around the illustrative images, where non-community resources preferred blocks of text. This difference is illustrated in the different words per line: the community-produced info sheets and pamphlets both had significantly less words per line than their
veterinary and commercial counterparts \(P = 1.1 \times 10^{-10}\) and \(P = 5.4 \times 10^{-10}\), respectively.

**Topics**

Twenty-five topics were found in the combined 109 resources. These were ranked from most numerous to least.

EC pamphlets were produced by companies selling their particular products, and so concentrated on communicating the advantages of these as much as exploring the issue at hand. These resources did not target any local peculiarities, but were a generic pamphlet for vet clinics at any geographic location.

Veterinary-created information sheets were in general more locally relevant, targeting locally common diseases, discussing local seasonal occurrences and the locally available range of solutions. They were more likely to cover a broader spectrum of issues in one information sheet, such as puppy care, as did the community-produced resources.

The single most popular main EC resource topic was nutrition, though veterinary services were subtopics in more resources and so ranked higher overall. However, the aspect of nutrition covered was variable between resources. Of the 20 EC resources covering nutrition, only two covered malnutrition, and this as a sub-topic.

Only one EC pamphlet and one EC information sheet discussed mange. One had a single paragraph discussing sarcoptic mange, the other resource discussed demodicetic mange.

Zoonoses were covered in most but not all EC resources that discussed worms, but never in any detail, and never visually. No other zoonoses were discussed.

One EC information sheet discussed one protozoal gastrointestinal disease, but did not cover the zoonotic aspect of protozoal diseases in general. No resource covered bacterial gastro-intestinal disease.

**Comparative analysis**

Community-produced resources included on average seven topics per resource, significantly more than the EC resource average of 3.3 \((P < 0.001)\). Further, the approach to topics sometimes differed. For example, hunting, though a topic of middling to high relative importance in both sets of resources, was approached differently by each. Community resources emphasized the link between country and hunting in a positive way, whereas EC resources showed a negative or neutral perspective.

Some topics that were addressed in community-produced resources were not addressed in EC resources, and vice versa. For example, tradition, spirituality and dog bite safety were never discussed in EC resources, and dog blankets, insurance, over-nutrition and arthritis were not addressed in community-produced resources.

**Text and image use**

The vast majority of EC resources had over 50% of their field as text (Table 1). The average amount of the visual field as image was 11% for information sheets and 26% for pamphlets: in both cases low. Only a single EC resource had more than 40% of the visual field as imagery.

Further, of this image component, only an average of 3.9% (for information sheets) and 69.4% (for pamphlets) was used to illustrate concepts in the text, further decreasing the amount of meaningful imagery. The range of communicative imagery varied between 0 and 100%, i.e. it was extremely variable between resources. Half of all EC resources had <50% of their imagery communicating a message from the text, and 65 out of 70 EC resources had <50% of their resource area used for images that explained the text. For a client with literacy difficulties, these resources would be particularly confusing and off-putting.

**Comparative analysis**

Community-produced information sheets and pamphlets had significantly smaller text-to-image ratios \((P = 5.1 \times 10^{-3} \text{ and } 1.1 \times 10^{-8}, \text{ respectively; Figure 1})\), as well as using significantly less area of text \((P = 2.3 \times 10^{-6} \text{ and } 2.9 \times 10^{-12}, \text{ respectively})\) and more area of images \((P = 2.6 \times 10^{-4} \text{ and } 3.4 \times 10^{-2}, \text{ respectively})\) overall. Community-created information sheets and pamphlets also used a significantly higher percentage of their imagery to convey the messages, rather than using them simply as decorative devices \((P = 4.7 \times 10^{-17} \text{ and } 6.2 \times 10^{-3}, \text{ respectively})\). Across all the resources, EC resources used an average of 15.4% of the resource field for communicative imagery, significantly lower than the community-produced resource average of 64.8% \((P = 4.0 \times 10^{-15})\).
### Table 1: Format, text and image use, and colour use in community-produced and EC resources

<table>
<thead>
<tr>
<th></th>
<th>Community-produced</th>
<th>Extra-community-produced</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poster paintings</td>
<td>Information sheets</td>
</tr>
<tr>
<td><strong>Format</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of pages</td>
<td>1</td>
<td>1.1 (1–2)</td>
</tr>
<tr>
<td>Font height (mm)</td>
<td>34 (10–70)</td>
<td>5.9 (3–8)</td>
</tr>
<tr>
<td>Words per line</td>
<td>—</td>
<td>3.6 (2–6.2)</td>
</tr>
<tr>
<td><strong>Text and image use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of area text</td>
<td>10.9 (1.2–28.8)</td>
<td>23.8 (8.5–45.8)</td>
</tr>
<tr>
<td>Percent of area image</td>
<td>74.4 (27.3–100)</td>
<td>43.1 (18.2–54.3)</td>
</tr>
<tr>
<td>Text:image ratio</td>
<td>0.18 (1.2–0.92)</td>
<td>0.63 (0.3–1.4)</td>
</tr>
<tr>
<td>Percent of imagery that is communicative</td>
<td>99.0 (87.3–100)</td>
<td>96.8 (78.3–100)</td>
</tr>
<tr>
<td>Percent of field that is communicative</td>
<td>75.3 (27.3–100)</td>
<td>42.0 (17.5–54.2)</td>
</tr>
<tr>
<td><strong>Colour use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of resources using two or more colours</td>
<td>100</td>
<td>87.5</td>
</tr>
<tr>
<td>Number of colours used in text</td>
<td>2.2 (1–5)</td>
<td>3.4 (1–8)</td>
</tr>
<tr>
<td>Number of colours used in background</td>
<td>1.9 (1–6)</td>
<td>5 (0–7)</td>
</tr>
</tbody>
</table>

All values expressed as average (range).
Because posters differed so greatly in their image use from information sheets and pamphlets, the community-produced and EC posters were analysed as a separate group.

While all but one of the community posters concentrated on pictorial representations of messages, the EC resources were split 50–50 between text-dominant and image-dominant formats. However, the majority (8/10) of EC posters still had text as their largest single field element, compared with 7 out of 20 community posters. Most community posters (12/20) had imagery as their largest single element. Further, average font height was significantly higher in the community-produced posters ($P = 3.6 \times 10^{-6}$), highlighting the visual nature of their text.

Both groups used mainly solid colours in their backgrounds rather than the white preferred in other EC resources. There were no significant differences in the number of text or background colours used ($P = 0.43$ and $P = 0.09$, respectively). However, EC posters still used significantly more text ($P = 1.3 \times 10^{-3}$) and less imagery ($P = 5.5 \times 10^{-3}$) overall. Though most of the imagery used was communicative, there being no significant difference between the community and EC posters in that respect ($P = 0.42$), because less imagery was used in the EC posters overall, the percent of the field containing communicative imagery was significantly lower in the EC resources ($P = 5.8 \times 10^{-3}$).

**Image content**

In the EC resources, the majority of people (65/94) were depicted as fair-skinned. Twenty-nine depictions were indeterminate, and 0 out of 94 depictions were dark-skinned. Community resources depicted a larger variety of skin tones (11/54 light, 14/54 indeterminate and 29/54 dark-skinned), with an emphasis on darker tones. Depictions of people in the two groups of resources were significantly different.

The EC resources depicted significantly more light-skinned people than the community resources ($t < 0.001$).

**Colour use**

Excluding posters, community-made information sheets used significantly more non-white colours in their backgrounds than EC resources ($P = 0.028$). However, though the community-produced resources had a higher average number of background colours than the EC pamphlets, this was not significantly different ($P = 0.28$). Because the number of pamphlets assessed was low, further resources may need to be analysed to investigate any potential difference. The number of text colours used was likewise not significantly different between EC and community information sheets or pamphlets.

Veterinary practice produced information sheets were noticeably less visual than either community resources or commercially produced pamphlets. None used any imagery, photos or otherwise, to convey the messages being communicated. No colour was used to differentiate between texts, or backgrounds: the use of colour was limited to decorative devices. The colour of the main text was invariably limited to black.

**Language**

Veterinary and commercial resources all used mixes of formal and casual registers of SAE as well as academic and technical dialects. Community-produced resources used informal registers of SAE, Aboriginal English and Kimberley Creole. Though these languages tend
not to use the longer words prevalent in more academic types of English, they also tend to drop smaller words such as articles. On average, the words in community-produced resources were shorter than those in EC resources, but not significantly so ($P = 0.05$).

Average sentence length was however significantly shorter in community information sheets and pamphlets ($P = 9.1 \times 10^{-8}$ and $2.3 \times 10^{-3}$, respectively). The average Flesch–Kincaid grade level of EC resources (grade nine) was significantly higher than the community resource average of grade two ($P = 5.8 \times 10^{-7}$).

Language differences are however notoriously hard to categorize in any meaningful way quantitatively, and so a qualitative discussion follows to illustrate the differences between languages used in the resources.

Formal, technical and academic language

Formal and Academic English were used exclusively in EC resources and did not appear in community-created resources. Example of formal and academic sentences included:

- Canine Parvovirus is a viral gastroenteritis that is highly contagious—Caring For Your New Puppy, University of Sydney.

- Sarcoptic mange is a highly irritating and debilitating skin disease caused by sarcoptic mites—Advocate, Bayer.

Formal and Academic registers of SAE sound more professional but can be off-putting for less literate readers.

Informal registers of SAE

More casual registers of SAE were used in both groups. An example of informal language in a commercial pamphlet follows:

- The thought of intestinal worms feeding away inside puppies is simply awful—Kiss Worms Goodbye, Bayer.

- Having some food on you makes it easier to catch the dog—Dog Bogey, Yarrabah.

Informal registers help to develop rapport with readers by speaking to them as if they were acquaintances.

Aboriginal English and Creole

Only community-produced resources used Indigenous languages such as Kimberley Creole and Aboriginal English.

- He mind’em but us, You mind’em but im, We all be good—Dog worms, Nirrumbuk Aboriginal Corporation (Kimberley Creole).

- Not most dogs eat veggies but some do—Feeding Dogs, Yarrabah (Yarrabah Aboriginal English).

Such local Indigenous languages are those that community members use from day to day and thus they understand new information more easily through them.

DISCUSSION

Topics

The priority dog health issues in Indigenous communities have considerable overlap with issues addressed in EC resources. However, not all issues are equally pertinent to remote and suburban areas. For example, while over-nutrition is a major problem in EC areas (McGreevy et al., 2005), undernutrition is currently the more important issue in most Indigenous communities (Constable et al., 2008). Further, some issues require different handling in Indigenous communities, such as the importance of sarcoptic mange, and the cultural importance of hunting dogs (Howe, 1993; Constable et al., 2008).

Community-produced resources often addressed many topics in the one document. This could partly reflect the holistic view of health in these cultures (Golds et al., 1997; Eckermann et al., 1998). However, it could also reflect the lack of resources accessible in communities. In urban and suburban areas, veterinary health promotion is well served by several sources, including veterinarians and veterinary nurses in clinics, trainers and behaviouralists in dog classes, breeders, pet shops, books, internet sites, school programs, television programs, as well as pamphlets, posters and information sheets. As such, the paper resources fill a specific niche in an established education environment.

The situation in many Indigenous communities is quite different. Especially in remote communities, the resources created during this project were often the first and sometimes the
only physical resources of dog health education in the community, and thus were required to cover a lot more ground.

Nevertheless, Indigenous communities have and continue to maintain some differing values from mainstream Euro-Australian culture (Heidemann, 1997). As also noted by Jamieson et al. (Jamieson et al., 2008), spirituality and tradition were an important part of community resources but were not addressed in any EC resource.

**Design**

The significant differences in colour use, dominance of imagery and the percent of communicative imagery highlight the importance of the visual in Indigenous resources. While its direct communicative nature makes imagery a useful tool in health resources, health promoters should be wary of differing cultural interpretation of images (Hughes et al., 2004). Image content must be chosen so that it is locally relevant and appropriate, or risk being misunderstood or not understood at all (Bredella, 1997).

Further, inappropriate images, particularly of people, can alienate or offend. As Taylor (1994) notes:

> Our identity is partly shaped by recognition or its absence, often by the misrecognition of others, and so a person or group of people can suffer real damage, real distortion, if the people or society around them mirror back to them a confining or demeaning or contemptible picture of themselves.

(Taylor, 1994, p. 25 cited in Bredella, 1997)

Thus, recipients look for things they can identify within a resource, and if this requirement is satisfied, rapport is developed. However, if the recipient has difficulty identifying with the resource, or feels themselves excluded from its message, not only will the resource have failed to deliver its message but may have damaged the relationship between the recipient and the health program, and even damaged the recipient’s self-image itself.

Sensitivity to this issue is especially important in the light of the ongoing impact of colonization and its effect on community empowerment/demobilization, feelings of victimization, and engagement in health behaviours. As Jamieson et al. (Jamieson et al., 2008) found in their investigation into human oral health in an Australian Indigenous community, community residents are required to achieve ‘ongoing cultural adaptation (...) to cope with the social and emotional impact of colonialism, living in missions, the stolen generation, loss of land, processes of assimilation and sustained disempowerment’ (Jamieson et al., 2008, p. 54). They found that the continuous adaptation process disempowered community members’ health behaviours to the extent that they were often reluctant to engage with health programs.

Resources should reflect the range of skin tones in communities in order to build rapport with the intended community recipients, so that they can identify with the resource and are more likely to engage with its message. Resources that do not reflect this may risk alienating recipients in these communities, and/or having their message deemed irrelevant. In light of this, no EC resource in this study appropriately reflected the range of skin colours that exist within communities, and are thus less likely to engage, and may in fact alienate their recipients.

**Language**

Reflecting the everyday languages used in the community is part of this effort to reflect community identity in the resource and improve engagement.

As Gray (Gray, 1990) notes that ‘Aboriginal languages are organised to record Aboriginal knowledge and thought (...) White people must understand Aboriginal language to truly understand the knowledge of Aboriginal people’ (Gray, 1990, p. 106), it is important to ascertain in which language people are most comfortable communicating. It also makes the resource easier for recipients to understand as they do not have to translate the intended message from an unfamiliar register. No EC resource employed the main languages spoken in communities, such as Aboriginal English. Some did use SAE, which is also used in communities, however their Flesch–Kincaid grade levels indicate that the level of SAE used may not be appropriate for a remote Indigenous community context.

Flesch–Kincaid grade levels give an indicator of the suitability of texts for readers of particular school grade level abilities, based on the US schooling system: it gives an indication of the ease of readability of the text. Our results showed that community-produced texts were much easier to read than EC produced text. In
fact, with an average grade level of grade nine, it brings into question how much of the EC messages would be communicated at all, because of the often lower levels of literacy amongst Indigenous communities.

Data on literacy in Indigenous communities are difficult to obtain. National testing is done at the school level, but detailed results are often not publically available. For example, Masters and Forster (Masters and Forster, 1997) report that 77% of Indigenous year five students sampled did not meet the literacy requirements for their grade level, but give no information as to the origin of these sampled students. However, the Northern Territory’ Department of Employment and Training did release their figures, which showed that 62% of urban Aboriginal and 21% of remote Aboriginal year five students achieved reading benchmarks in 2004 (DEET, 2005). These data need to be taken in light of the lower attendance rates of many Indigenous children. For example, a national census found that only 55% of 16-year-old and 36% of Indigenous 17-year-old were still attending some schooling (ABS, 2006). Again, many remote communities have even lower levels (Kral and Schwab, 2003).

Adult literacy is even more problematic to find published data on, however, a study of two remote communities found that 60% of men and 40% of women were not competent at the lowest National Reporting System Standards (i.e. respondent can identify personal information in a personally relevant text and can write his or her own name and address; Kral and Schwab, 2003). Literacy rates would be expected to be higher than this for Aboriginal people in rural and urban areas: as Hughes et al. (Hughes et al., 2004) note, each individual has different learning preferences and there are many strongly literate Indigenous people. Nevertheless, generalized literacy data on top of the reported preference for visual material (Hughes et al., 2004) means it is likely that text-based material with high Flesch–Kincaid levels may not be able to be well understood by a large proportion of community members. This is another reason why text-dominant resources are likely to alienate recipients.

**Cross-cultural communication**

The important differences in languages and registers noted here emphasizes the importance of using local people in resource production, as they are well versed in local languages such as Aboriginal English and the underlying cultural values and mores of communication. Local residents can be more easily trained in dog health knowledge than can outsiders be trained in effective cross-cultural communication.

Given the recommendation to use local residents to create resources, the usefulness of quantitative guidelines could be questioned. However, because team members need to share their expertise during the creation of community resources, EC team members will communicate their messages more easily by including visual resources to help illustrate them. These ‘pre-program’ resources should follow the recommendations below to be most effective.

**Comparisons to published data**

In a study presenting the format preferences of Indigenous Health Workers and other health professionals, O’Connor et al. (O’Connor et al., 1999) recommend Indigenous health resources use colourful, simple design, large print, appropriate reading age level, culturally appropriate and locally relevant images and language. Even those with quality content were not considered effective if their presentation was not appropriate. They concluded that the most appropriate relevant and effective resources were those specifically created for Indigenous communities, or even better, a resource that was specific to the community being targeted, not a generic resource for all Indigenous people.

On that basis, all the EC resources analysed here were not appropriate on almost all counts. However, rather than assume this from derived calculations, the next stage of this research explores the preferences of community residents for examples of the different resources, and further explores the impact of these resources on the community (Constable et al., 2012b).

The results of this study support those of Brady and Mackenzie-Taylor, investigating their resource ‘The Grog Book’ (Brady and Mackenzie-Taylor, 2002). They found that health resources need to accommodate both visual and text-based learners, emphasized the importance of images and depictions of people the viewer could identify with, full-colour over two-colour, breaking up blocks of text, and the importance of relevant and communicative languages like Aboriginal English. Further, our results show...
that resources produced by rural and remote Indigenous community members over four states and territories upheld the recommendations of Brady and Mackenzie-Taylor (Brady and Mackenzie-Taylor, 2002), O’Connor et al. (O’Connor et al., 1999) and Schoen et al. (Schoen et al., 2010) that generic or mainstream resources were not appropriate. This is the first time such issues have been researched in the veterinary sphere.

CONCLUSION

Extra-community dog health resources differed significantly from community-produced resources in terms of number of pages, background colours, text-to-image ratio, format of text, language, usefulness of imagery and depiction of people. These differences in many cases rendered them inappropriate for use in remote Indigenous communities. Topics, format and language should be considered when devising health promotion resources for communities, in order to create the most effective vehicle to share your health message. Engaging with local residents ensures the resources produced are relevant and appropriate, and thus more likely to be effective.

RECOMMENDATIONS

Resources should be created by a partnership of local and professional stakeholders. While health professionals may have high-quality information to share, it is no use if it is not locally relevant and conveyed in an appropriate way.

(i) Resource design should be colourful and eye-catching, emphasizing the visual nature of the resource. Locally relevant colours and shapes are more likely to engage residents.

(ii) Image-dominant communication: Imagery should be the main message carrying device of the resource with text being supplementary.

(iii) Text should not form more than 50% of the visual field, or more than 50% of the text-to-image ratio.

(iv) Text should be formatted using large fonts and low numbers of words per line to increase reading ease.

(v) Language should be chosen so that it is easy to understand as well as locally appropriate.

(vi) Depictions of people should reflect the local situation.

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