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Indigenous round houses versus 'healthy houses': Health, place and identity among the Dawan of West Timor, Indonesia.

Yohanes Kambaru Windi [a,1], Andrea Whittaker [b,*]

[a] Key Centre for Women's Health, University of Melbourne, Level 2/723 Swanston Street, Carlton, VIC 3053, Australia.
[b] School of Psychology and Psychiatry, Faculty of Medicine, Nursing and Health Sciences, Monash University, Caulfield Campus, Caulfield East, Melbourne, VIC 3145, Australia.

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ABSTRACT

Qualitative research was undertaken among Dawan people living in Fatumnasi, West Timor, to investigate the reasons for the Dawan's retention of traditional houses, *ume kbubu*, in the face of a national development campaign to introduce modern, "healthy" homes (*rumah sehat*). Indoor smoke pollution from internal fires and poor ventilation is believed to contribute to poor respiratory health among this population. The study explored Dawan cultural constructions of health to find that *ume kbubu* are fundamental to the Dawan's sense of psychosocial well-being and ethnic identity. While *rumah sehat* are associated with prosperity, public image and social status they do not provide the warmth, security and emotional nurturance that the Dawan perceive as necessary for optimum health and to protect them from disease.

1. Introduction

Despite an extensive literature on housing and health, relatively few studies focus on developing countries (Arku et al., 2011) and even fewer describe cultural health beliefs and practices regarding housing that might inform the design of appropriate public health interventions (for an exception see Albalak, 1997). Drawing upon insights from medical anthropology and health geography in this paper we explore local understandings of houses inhabited by an indigenous Dawan community in central West Timor, Indonesia. We examine what happens when indigenous notions of health and housing conflict with public health housing interventions.

Housing has traditionally been one of the core areas of public health research and intervention (Shaw, 2004). Housing affects health directly through the physical environment (Arku et al., 2011; Gibson et al., 2011; Dunn, 2000). It also affects health status indirectly through area characteristics and housing tenure but also through its role as a component in general well-being, ontological security (Kearns et al., 2000; Dupuis and Thorns, 1998) social status, sense of community and social capital (Shaw, 2004).

Studies of housing and health in developing countries mainly focus upon urban areas and the health effects of poor water and sanitation, flooring, inadequate heating, poor food storage and overcrowding (Arku et al., 2011; World Health Organization, 2010; United Nations Commission on Human Settlements (UNCHS), 1998). Relevant to this paper is the considerable literature on the harmful health effects of indoor air pollution caused through the use of biomass fuels for cooking and heating (Rehfuess, 2006; Bruce, 2005, 2000). Pollution associated with the burning of wood, charcoal or animal dung is linked with diseases such as acute lower respiratory infection (ALRI), chronic obstructive pulmonary disease (CPOD), obstructive airways disease (OAD) and lung cancer (Warwick and Doig, 2004; Schirnding, Bruce et al., 2000). There is increasing focus upon housing interventions as a means of improving the health status of occupants (World Health Organization, 2010). However, most studies of such interventions have been in the developed world (e.g., see review by Gibson et al., 2011).

But houses are more than built environments. Researchers in sociology, anthropology, human geography and architecture recognize the multiple meanings of houses as 'homes' — as a place, feeling and a state of being (see review by Mallet, 2004). In the case of the home as a place, the concept of 'therapeutic landscapes' (Gesler, 1993) is a useful framework for the exploration of the connections between place, identity and health and how physical, individual, social and cultural factors come together in the generation and maintenance of well-being and health (Kearns and Gesler, 1998; Gesler and Kearns, 2002; Williams, 1999). For example, some research has highlighted the meanings

* Corresponding author. Tel.: +61431791207.
E-mail addresses: yohanes_windi@yahoo.com (Y. Kambaru Windi), andrea.whittaker@monash.edu (A. Whittaker).
[1] *Permanent address*: Politeknik Kesehatan, Kementerian Kesehatan, Surabaya. Jl. Pucang Jajar Tengah 56 Surabaya, Jawa Timur, Indonesia. Tel.: +62 31 5027058; fax: +62 31 5028141; Mob.: +62 13 30624792.

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and experience of the homespace as a site of caregiving (Dyck et al., 2005; Williams, 2002). The therapeutic landscapes concept appreciates the importance of place as a social and collective category and recognizes a more holistic notion of health as a complex interaction of physical, mental, emotional, environmental and societal factors (Williams, 2002). One critique of the therapeutic landscapes literature has been its cultural bias — most studies utilizing this framework tend to be based in Western countries and assume Western 'universal' meanings of health (Wilson, 2003). However, by combining this approach with the recognition from a medical anthropology perspective of cultural diversity in notions of health and well-being, it is possible not only to explore how different cultures construct notions of place and health but also to examine contestations that occur when differing views of place and health collide. In this paper, we draw upon these various perspectives from health geography, medical anthropology and public health to consider the outcome of a public health intervention to promote 'healthy housing' among Dawan people in West Timor, Indonesia.

2. Field setting

Fatu Makono (a pseudonym) is a remote village in the province of Nusa Tenggara Timur (NTT), West Timor, Indonesia. It lies on the flanks of Mount Mutis (2252 m) at an altitude of 1500–1800 m above sea-level (Fig. 1). The climate is cold and wet by Indonesian standards, with annual temperatures ranging from 11–28 °C while daily temperature can fluctuate by as much as 15–20 °C. Average annual rainfall is 1015 mm, falling from 7–10 months of the year (Bay, 2006; Oematan, 2006).

Access to the village is difficult: the 120-km bus journey to the provincial capital of Kupang takes 3–4 hours. Fatu Makono has few services, no running water and electricity is limited to the main street. Only a few villagers have mobile phones. In 2006, Fatu Makono had a total population of 1540 distributed across 411 households (Bay, 2006; Oematan, 2006). Each household is occupied by an average of 3–5 people. The population is skewed towards a younger demographic with 21% aged under 15 years and only 2.27% over 60. Education levels are low with many villagers having little or no schooling. Ninety-nine percent of the population is Christian, with Pentecostalism being the predominant form. A variety of non-Christian cultural practices and beliefs are also sustained, including ancestral stories and customary rituals.

The majority (86.5%) of villagers are farmers growing upland crops such as corn cassava, sweet potato, oranges, garlic, coffee, as well as raising livestock (Bay, 2006; Oematan, 2006). *Jagung bose*, made from corn which has been smoked, ground, soaked in water and then pounded to extract the black layer, is the staple food for this community.

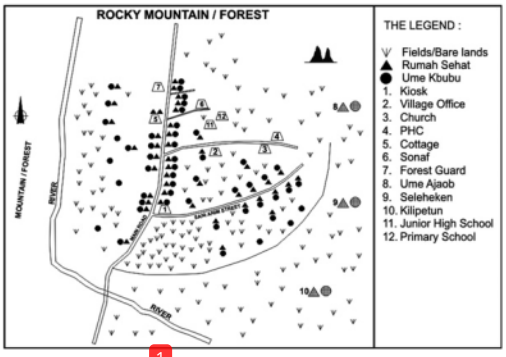

Fig. 1. Map of Fatu Makono.

3. The Dawan people

Originally immigrants to West Timor, the Dawan (also known as *Atoni Pah Meto*) are an indigenous group who claim shared origins with the nearby Belu (Doko, 1981; Therik, 2004). Their matrilineal kinship system requires men to live matrilocally upon marriage. According to Social Welfare Department estimates the Dawan now comprise over half (61%) the population of West Timor. This is based on a figure of 809,394 Dawan in an overall population of 1,321,450, however these figures are difficult to confirm. While Dawan is the main language of daily conversation (*bahasa daerah*) in Fatu Makono, most villagers can speak some Bahasa Indonesia (hereafter B.I.), the Indonesian national language.

McWilliam (1999) suggests the relationship between indigenous peoples of West Timor and the Indonesian state reflects an ongoing tension inherent across Indonesia between local 'traditional practice' and authority (B.I. *wilayah adat*) and the 'modern' ideological prescriptions and administrative powers of the national government. The various people of West Timor have been the focus of development (B.I *pembangunan*) viewed as a means of modernizing the region cast as 'traditional' and associated with backwardness, feudalism, national security concerns and economic inertia. The tension described in this paper over housing is one further example of the devaluing of local traditions and imposition of centralized policies within a discourse of public health interventions.

4. Methods

Fieldwork for this qualitative study was carried out in 2007 over a period of four months in which the first author conducted ethnographic research in Fatu Makono village. Participant observation was effected through living with various Dawan families in their *ume kbubu*. The first author is Indonesian, although not ethnically Dawan, and has had a long association working with this community, having lived in the region in 1993 and elsewhere in Timor for many years. The second author, an Australian medical anthropologist, assisted with the study design and data analysis. Data-gathering methods included conducting semi-structured interviews; a natural group discussion (NGD); observation; documentation reviews; casual conversation; and assisting in the construction of a new *ume kbubu*. 12 primary participants, (six women and six men), as well as three local elders, the village head, the head and three staff members of the district medical center (B.I. *puskesmas*), a Protestant minister, a traditional healer (B.I. *dukun*) and a Charismatic Christian faith healer served as key informants, giving a series of detailed interviews, both informal and formal, on health beliefs and housing practices. The natural group discussion was also held involving the same three elders, four of the selected primary participants and the three religious leaders. All interviews and the NGD were audio-taped with permission of the participants. Ethical clearance for this study was obtained from the Human Research Ethic Committee of the University of Melbourne (HREC No. 0711740.1). Mindful of the sensitivities and power relations of research among indigenous communities (Dyck and Kearns, 1999), the study included careful community consultation with village elders prior to commencement of the study, culturally appropriate verbal informed consent procedures and community feedback. Our study is limited by the fact that neither author is Dawan, nevertheless, interviewees reassured us that community

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members were eager to explain their lived experience to the first author and have their point of view documented. All names of individuals and places are pseudonyms to protect individuals from identification.

On-site analysis was done during fieldwork, identifying issues to be followed up in the next phase of data collection. All interviews and fieldnotes were transcribed and translated into English. Data were manually coded and categories of data were verified through comparison across the data set to see the interrelationship among them and construct a grounded theoretical explanation (Grbich, 2007).

5. Findings and discussion

Currently most Dawan live in indigenous houses known as *ume kbubu* (round house/s) which are viewed by local health authorities as 'unhealthy' due to their typically poor ventilation and high exposures to indoor smoke from cooking fires. In what follows we explore the links between indigenous housing and local notions of health vis-a-vis the 'healthy house' intervention. Although a national scheme to promote healthy living through the conversion to rectilinear, modern housing (McWilliam, 2002) has resulted in the widespread construction of *rumah sehat* (B.I., healthy house/s), the majority of Dawan people residing in Fatu Makono continue to live and work in their round houses. We find that healthy houses are being built as status symbols but not necessarily as residences, defeating the objectives of the 'healthy houses' programs. To understand the reasons why Dawan continue to live in *ume kbubu*, we explain the symbolic significance of *ume kbubu*, Dawan notions of health, and particularly, how smoke is viewed as a 'friend' by many Dawan, in contrast to public health understandings of the dangers of indoor smoke pollution. Furthermore, the inadequate thermal properties of the low-cost versions of most *rumah sehat* built in the community in contrast to the warmth and symbolism of *ume kbubu* as places of healing and female nurturing space is analyzed.

5.1. Indigenous housing: Ume kbubu

The Dawan people in West Timor traditionally build three co-located dwellings called *lopo le'u* (sacred house), *lopo* (house) and *ume kbubu* (round house). The *lopo le'u* is a sacred place where ancestral relics are stored and ritual ceremonies performed. *Lopo* and *ume kbubu*, on the other hand, are secular domains where private, social and communal activities are held. While *ume kbubu* is a more private or personal space for the family, the *lopo* is associated with communal relationships (Boymau, 2006). In Fatu Makono, *ume kbubu* do not stand in isolation but in matrilineally-related clusters of households entailing extended families.

Standing four meters tall and less than five meters in diameter, *ume kbubu* are beehive-shaped structures. They have only one front door (*nesu*), no windows or ventilation, an internal open fireplace and an earthen floor. They also have four main pillars called *ni ainaf*, and 28–36 lesser pillars, called *ni ana*, which serve as the supporting frame of the outer wall (*aklipit*). The roof is made from long coarse grass that extends to the ground. The *nesu* or door through which the *ume kbubu* is entered is so low that people must bend down and crawl through it in order to get inside. The interior contains a fireplace consisting of three large stones in a triangle. Above the fireplace different sized hooks are suspended from which to hang cooking pots.

The *ume kbubu* effectively traps heat from the fire to warm the room. Smoke from the fire also is used to preserve food, primarily corn. Food is stored in an attic called *poaf*. Corn and other foods are tied up in such a way that the smoke and heat from the fireplace can dry and preserve the corn.

5.2. Symbolic meanings of Ume kbubu

Houses in Timor are iconic markers of social and ethnic identity as well as cultural heritage (McWilliam 2005). Ethnographic studies of indigenous architecture illustrate the enduring significance of traditional architectural forms and the significance of their orientation, articulation of structural elements, spatial demarcation and symbolic relations (Fox, 1993). In its ordered physical arrangement, the *ume kbubu* of Dawan communities provides 'a theater of memories' (Fox, 1993, 23) embodying and configuring cultural and social values of society. McWilliam notes that across Timor, the indigenous notion of the house is 'simultaneously a social construction and a ritualized focus for the articulation of social relations and exchange among 'house' members (2005, p. 28).

The material and spatial arrangement of *ume kbubu* represents and structures the ways of life, experiences and beliefs of the Dawan community in *Fatu Makono*. *Ume kbubu* have no partitions (Fig. 2) and the spatial arrangement of the interior symbolically orders the physical space in terms of everyday social roles, status and gender relations. The eastern side of the house is deemed male and is occupied by the father, while the mother presides over the rear, near the kitchen utensils. Children tend to stay around the gender neutral area of the fireplace. Guests either sit near the entrance or on the east or west side of the house but are restricted from straying into its deepest recesses, a female domain.

Gender relations are further symbolized by the low door (*nesu*) to the *ume kbubu* which dictates that people must crouch down low in order to enter. The explanation for this is articulated in local mythologies which depict all foodstuffs as coming from the body of a woman. According to local elders, in the distant past, in times of drought and famine a woman would be sacrificed by divine command through the mediation of a traditional priest (*tobe*) to save the people from starvation. Once sacrificed, her body and blood would be spread over the earth. From her body parts grew various crops that would then help the people to survive (see also Middelkoop, 1982). Bending down when entering or exiting the *ume kbubu* is thus a mark of respect to the foodstuffs hanging over the fire which signify the sacrificed woman.

While the spatial ordering of the house expresses these everyday social relations, the physical construction of *ume kbubu* has multivalent symbolic associations articulating fundamental Dawan notions

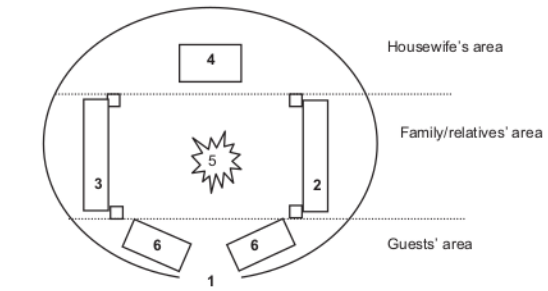

Fig. 2. Layout of *ume kbubu*.

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cultural identity and the social order. Informants differ in the interpretations they give regarding the physical structure of the *ume kbubu*, emphasizing either cosmological or social meanings. According to the former, the physical structure of *ume kbubu* reflects and reinforces Dawan oral traditions regarding their ancestral origins. As Rion (46 years old) noted:

> From what I see, or what I hear, every part of the round house has meaning — the big poles, small poles, the ceiling, and so on. The round house is something important for our community. I mean the round house supports and protects our life. It is our tradition from our ancestors that we need to maintain it whatever the cost. The round house not only protects us, it also preserves our harvests.

Dawan origin myths chart a complex genealogy legitimating their sacred connection to their natural and social environment. According to these myths, the Dawan's founding ancestor, *Maromak Oan*, originally came from Malacca to establish a kingdom in the central region of West Timor. He was accompanied by four trusted viziers or *amaf* – *Amaf Bay*, *Amaf Boko*, *Amaf Balan* and *Amaf Sa'u* – who are thus also recognized as direct ancestors of the *Fatu Makono* Dawan. This sacred relationship is inscribed into the plan of the *ume kbubu*: four of its five main pillars represent these four founding *amaf*. The fifth, located in the middle of the house, represents the divine power of Maromak Oan (conceived of as God) and reigns supreme.

This sacred connection to the ancestors imposes critical obligations upon the Dawan. Elli (42 years old) states:

> [The round house] was our ancestors' heritage. They used to live in it. It is our obligation to maintain this heritage and obey all the traditional values of the house.

An alternative interpretation relates the structure of the *ume kbubu* back to gender relations, suggesting that it serves a symbolic charter for the ordering of domestic relationships within the household. Thus Abe (56 years old), another elder, stated:

> Our ancestors believed that the round house is the representation of the world. The four poles represent mother and father. The two eastern poles (*ni ainaf*) represent the husband's family whereas the two western *ni ainaf* represent the mother and her relatives. The fifth pole represents God.

The two north–south *ni ainaf* are connected by two main beams, *suif*, to form parallel bars. For structural reasons, the *suif* differ in length by a few centimeters. This is said to symbolize the husband/wife dyad in which the longer *suif* represents the husband as the leader of the family, and the shorter, the wife (Fig. 3).

Alternatively, the two *suif* are said to represent the first two ancestors, *Amaf Bay* and his brother *Tefa*. The longer *suif* symbolizes the commitment to appoint one of the *amaf* as the leader of the community and so is said to remind the community that a single leadership will help the community survive.

The construction of the *ume kbubu* thus reconstructs Dawan social relationships. This is reinforced by rituals involving the completion of the house. The wife's mother's brother (*atoin amaf*) has an important role within Dawan kinship structures and this is reflected in his involvement with the construction of the *ume kbubu*. It is the *atoin amaf*'s prerogative to start work on the roofing of the house and no workers may start work until he has performed this action. On completion of the roof, it is the *atoin amaf* again who cuts the grasses hung in front of the door (*keut nesu*). This act symbolizes the *atoin amaf*'s leadership of the family.

Before entering the house, the husband gives a *tiba* (male betelnut container) to the *atoin amaf* containing the fee that has been agreed upon before the building of the house. After taking this fee, the *atoin amaf* holds the hands of his niece and her husband and leads them into the house, followed by their relatives. The *ume kbubu* is then ready to be occupied. The completion of the house-building is consecrated by the lighting of a fire with which to cook the ensuing communal lunch or dinner.

5.3. *The promotion of 'healthy houses': rumah sehat*

Local public health officials believe that *ume kbubu* contribute to health problems, particularly respiratory illness, among its occupants (Junias, 2005; Buntoro, 2006). Although no definitive

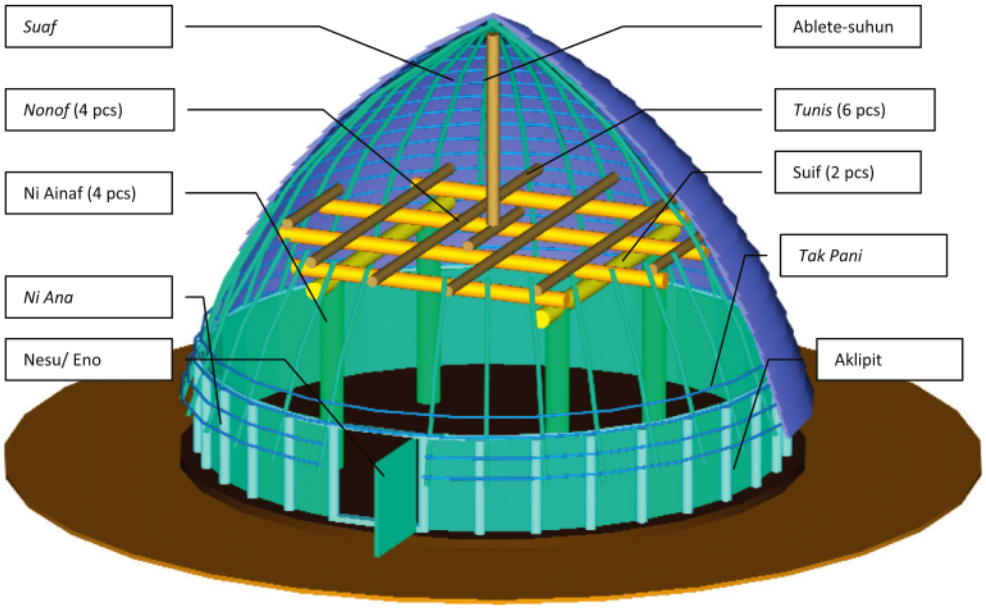

Fig. 3. The architecture of ume kbubu.

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epidemiological work measures the actual risks associated with this form of housing, it is likely that the lack of ventilation and the indoor smoke exposure contributes to respiratory illnesses. Round houses are therefore labeled as 'unhealthy housing' by local authorities who advise villagers to avoid living in them. For example, the Head of the local Primary health center stated he advises people to stay out of round houses:

> Round houses are posing considerable risks to its dwellers because of the huge exposure to smoke, the room is narrow shared by one family, there is no ventiliation for fresh air to flow.

Likewise the local midwife explained:

> We believe living in round houses is the main factor contributing to the prevalence of acute respiratory diseases. The smoke and dust in the *ume kubu* are negatively affecting the health of its occupants. Meanwhile skin problems are due to people not taking a bath regularly. They perhaps take a bath every 2 or 3 day. Some do not even take a bath once in a week.

What also confuses the epidemiological picture is a high prevalence of tobacco smoking in this community. The increasing incidence of acute respiratory disease (ARD) as documented by the local primary health center (PHC) over the last two years is nearly twice the rate of that for the district as a whole (48.71% compared with 26.1%). This pattern continued into 2007, with 53.4 percent of the conditions treated at the PHC in the first six months of the year being attributed to ARD (Tode, 2007). The prevalence of ARD in *Fatu Makono* is higher than for any other area of South Central Timor District. Local people also suffer from a range of environmental health and sanitation-related diseases classified as 'rheumatism', 'skin problems' and 'scabies'.

Rumah sehat or 'healthy houses' refers to rectangular houses promoted by the government as alternate housing (McWilliam, 2002). Other terms used for these houses include *ume plenat* (government house), *uim kase* (non-indigenous house) or *ume blek* (referring to the corrugated iron roof of *rumah sehat*) (McWilliam, 2002). Village elders suggested that such rectangular houses may have been introduced in the region during the Dutch and Japanese colonial periods. According to a former village headman it was during the 1970s that rectangular houses first began to be advocated by the government as a health promotion program. Most Dawan in towns live in rectangular *rumah sehat*. It is estimated that 41.4 percent of families in South Central Timor District now live in *rumah sehat* (Suryanata, 2004).

Two types of *rumah sehat* may be distinguished from the building materials used and the expense. The first more permanent variety has walls made of bricks (plastered/not plastered), a cement floor (sometimes tiled), a corrugated metal roof and in some cases a ceiling. It also has good ventilation. Doors and windows are made from timber and some houses have glass windows. A less expensive version is the *rumah setengah tembok* (semi-permanent, lit. 'half-concrete' house) house that refers to a house with walls which are mud-bricked halfway up and completed with timber or palm thatch running to the top. The *rumah setengah sehat* is cheaper to construct as it is made from local materials. The walls are made from bamboo or thatched palm stems (*gewang*). The floor is not cemented. The roof is mainly *alang–alang* (imperata grass) or sometimes corrugated metal. Newspapers or old calendars are frequently used to line the walls. Such construction materials offer little protection from the cool winds.

Rumah sehat have at least one or two bedrooms, a living room and a function room. Sometimes a bed frame with mosquito net is placed in the living room and this is where guests sleep. The house is not equipped with a kitchen or in-house toilet. The toilet (burr hole or non-flush toilet) is usually built more than 10 m away in the backyard. Many families living in *rumah sehat* and *ume kbubu* do not have any sanitation facilities.

Across the region a number of government programs by different government departments have promoted the building of *rumah sehat* with the aim of establishing livable houses that meet government health guidelines. According to a staff member from the Social Welfare Department, the program began during the massive Family Planning Program campaign conducted throughout Indonesia, during which the central and local governments through *Badan Koordinasi Keluarga Berencana Nasional, BKKBN* (the National Coordinating Bureau of Family Planning), launched a program called *lantainisasi* (cementing the floor). A cement floor is seen as a way to minimize the spread of soil-related diseases such as helminth infestation and respiratory diseases caused by dust. *Lantainisasi* was established to encourage and reward the acceptors of the family planning services. The government assisted the acceptor with non-local materials such as cement, while the owner provided local materials such as sand and rocks. At the same time, the Health Department was responsible for the promotion of another program called *jambanisasi* to build non-flushed or burrhole latrines to reduce the transmission of diseases such as cholera and dysentery. The *rumah sehat* program then became an interdepartmental program. The BKKBN continued to assist family planning acceptors with non-local materials to build a *rumah sehat*.

The *Departemen Pemukiman dan Prasarana Wilayah* or KIMPRASWIL (The Community Housing and Public Infrastructure Department) of the South Central Timor District also promoted *rumah sehat* through a program called ALADIN which stands for *atap* (roof), *lantai* (floor) and *dinding* (wall). The Aladin *rumah sehat* program was launched in 2002. The program assists people with non-local materials such as corrugated roofs, cement and concrete. The ALADIN program is focusing on the building of *rumah sehat* along the roads from the border of Kupang District to the capital South Central Timor District. Although the *rumah sehat* program has been launched throughout the District of South Central Timor, the coverage of the program is limited in Fatu Makono. According to a staff member of KIMPRASWIL, 637 *rumah sehat* were built throughout the District of South Central Timor between the launch of the program in 2002 and 2006. The head of Fatu Makono village noted that in 2006 only two families in *Fatu Makono* received non-local materials to build *rumah sehat*. However, these two *rumah sehat* had not yet been built due to the inability of the families to contribute the other building materials as required by the program.

Another program headed by the local Social Welfare Department concentrates on building *rumah sehat* for those who have suffered from natural disasters such wind damage or landslides. People impacted by such events are encouraged to replace their *ume kbubu* with *rumah sehat*. The Social Welfare Department (SWD) assists the people with cement, nails and metal roofs and the people contribute local materials such as sand, rocks, timber and labor.

5.4. *Rumah sehat as a status symbol in Fatu Makono*

Fatu Makono residents continue to live in their *ume kbubu* for a number of reasons. As McWilliam (2002) notes, the 'healthy-rectangular' houses do not automatically substitute for *ume kbubu*, which continue to have an essential function in Dawan social life. *Rumah sehat* mostly function as a place to receive visitors or guests. In this respect, the *rumah sehat* in Fatu Makono is a modern version of the *lopo* (house) traditionally built by Dawan people in other regions as a guest house and status

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symbol. It remains common for *ume kbubu* to be built behind the *rumah sehat* where it continues to serve as the main living place. Most villagers only use the *rumah sehat* in the event of a visit from a non-indigenous outsider (*kase*) such as a local dignitary or a government officer. In *Fatu Makono*, the *rumah sehat* functions as place where formal meetings can be conducted and prestigious, non-local guests may be received, rather than as a space for everyday living. It is therefore not surprising that ownership of a *rumah sehat* is also seen as a symbol of one's rising economic status. As Abe (56 years old) suggests:

> … If you build *rumah sehat*, especially the permanent one [referring to the fully concrete house]), it means you are rich … So, if you are able to build a *rumah sehat*, people turn to you and admire your capability.

In Fatu Makono, poorer villagers aspire to acquire a *rumah sehat* as a symbol of prestige and economic prosperity, without necessarily wishing to live in it.

Consistent with its function as a place to meet and entertain guests, the *rumah sehat* is viewed as belonging to the public male domain of political interaction and economic status. It is not associated with the kitchen hearth, the private, nurturing, female space of the *ume kbubu*. For instance, cooking is not conducted in the *rumah sehat* as the soot will dirty the house, which means that all food preparation, cooking and food storage continues to take place within the *ume kbubu*, thereby continuing the indoor smoke exposure for women while cooking.

5.5. Contested understandings of health and housing

To understand choices made by Dawan people to continue to live in *ume kbubu* requires insight into how concepts of health and well being are constructed within these communities. Notions of health and illness are culturally constructed and often differ markedly from dominant epidemiological discourse and biomedical categories (Helman, 2000, p.218). As described above, health workers, government officers and outsiders believe that *ume kbubu* are a major contributor to poor health among the Dawan due to the excessive exposure to wood smoke and the lack of ventiliation (Buntoro, 2006; Tode, 2007; Junias, 2005). Authorities associate *ume kbubu* with poverty, backwardness and unhealthy living environments. A few villagers agree with public health authorities' views about the potential hazardous aspects of *ume kbubu*. For example, when asked about the health impacts of *ume kbubu*, Oma (66 years old) explains:

> I definitely agree. According to me, the *ume kbubu* is not healthy……There is too much smoke and dust inside….even ashes from the fireplace. Maybe some people say it is healthy….. I do not think like that. It has many bad effects on our health such as cough, influenza, headache, sore eyes etc. as it has a lot of smoke inside. However, it has the benefit of allowing us to store and preserve our corn and rice.

Although a small number of villagers prefer living in *rumah sehat*, citing its cleanliness, better airflow and larger space compared to the *ume kbubu*, the majority of Dawan in Fatu Makono continue to reside primarily in their *ume kbubu*. In contrast to the views of health workers, many villagers perceive *ume kbubu* as a healthy living space. When questioned about what makes a person healthy or sick, villagers respond with a range of factors far broader than simply the presence or absence of sickness. Villagers view health as a result of a combination of factors such as one's economic status, happiness, the presence of social support and good relationships. They also associate health status with personal qualities such as having the capacity for hard work and having faith in God. In contrast, illness has multiple causes, from poverty, laziness, sadness, immorality, evil spirits and God's will. Many villagers continue to employ traditional healers in the treatment of illnesses defined as caused by evil spirits, and disorders resulting from *angin jahat* (lit. ill wind) or *pah oel* (illness related to evil from water). The '*orang pintar*' (gifted or clever person) or *dukun* (traditional healers) handle such cases. In addition, Charismatic Christian faith healing by the local priest occurs regularly during weekly sermons.

Local perceptions of risk and causality of illness also differ from those of public health officials. Villagers suggest that illness and disease are unavoidable facts of everyday existence and hence are equally experienced by those living in *rumah sehat*. Indeed many view the *rumah sehat* as also potentially causing illness due to inadequate heat retention. Rion, for example, argues:

> The round house is the most suitable place to live from the time of our forefathers until today's generation. It is a comfortable place…so….we cannot leave it. Our grandparents lived longer than others. I am not saying that we do not get sick in there….we get many diseases…of course. But we are happy to live in the round house. If they [public health officials] say that the round house is a source of disease……I think people who live elsewhere other than the round house also experience the same thing. So….we do not agree that the round house is a source of illness.

Rather than a source of illness, *ume kbubu* is depicted as a comforting protective space. Theos (65 years old) says:

> We do not have to worry about disease and illness. These come and go as they should. It is beyond our power….we have no choice. The only place that helps us to survive is this house-…..the round house. Like animals have their own shelters…we do….the *ume kbubu*. It protects us…..It just like a king who protects us.

Adequate warmth and heat, both in a humoral and physical sense, is also seen as important to maintain health. Since most of the *rumah sehat* in *Fatu Makono* are semi-permanent or made from local materials, it is easy for cold wind to come through gaps and holes among the walls. As Elli (42 years old) suggests, *rumah sehat* are seen as inadequate for the cool climate of Fatu Makono:

> Definitely, we cannot spend much time in the big house, especially on January, February or during the wet season. We couldn't stand to sleep in the *rumah sehat* because of the strong cold wind. We're afraid the wind could fly down our roof. It is too risky for us.

Yus (34 years old) suggests that a *rumah sehat* could be a comfortable house if built with concrete walls and ceiling to minimize the penetration of cold air, but few *rumah sehat* in the village are constructed as such.

5.6. 'Friendly' smoke

Villagers also differ from authorities in their perceptions of smoke. As a cool area with high humidity where received sunlight is low, using the sun as a means of drying food is not possible in *Fatu Makono*. Smoke is the primary means of food preservation among villagers. In the humid climate of Fatu Makono, food rots quickly, and unless the grain is preserved by smoking there is a possibility of food scarcity during the dry season. Smoke also dries out the house and keeps out harmful insects such as weevils (*fufuk*) and rodents. It also enhances germination, endurance, and vigor of seed stock for replanting. As Lena (60 years old) notes:

> If there is a lot of smoke, we may suffer from headache and cough. But we cannot live without smoke. It preserves our

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corns. People here….rely greatly on corn. It is our main staple food. If you stay away from the round house, no fire…the corn will get *fufuk*. So what will you eat then?

Rather than a threat, most people of *Fatu Makono* speak of smoke from their central fireplace as a familiar "friend" to live with as the comment from Rion illustrates:

I think whoever experiences its [*ume kbubu*] warmth and smoke would say that *ume kbubu* does not endanger their health. But those who never experience living in the *ume kbubu*, with all its smoke, certainly believe that it is harmful. But we are used to the smoke. We have no worries about the smoke. Because we are used to it and have become "friends" with it [laughs]… If we are friends, it is no danger to us at all.

5.7. *Ume kbubu as female nurturing space*

As noted earlier, the story of the sacrificed woman underscores the social construction of *ume kbubu* as a female space associated with a woman's body and nurturing warmth. Women are always associated with the kitchen space of *ume kbubu*. Lena states:

I have experienced the smoke for a long time. And…… therefore I am familiar with this smoke. My parents told me that…*ume kbubu* is a woman's place. We must live close to *ume kbubu*. It protects us from cold and diseases. If you get cold…you easily get sick. If you are warm…you are healthy.

Consistent with this notion of the *ume kbubu* as a female nurturing space, birthing in Fatu Makono always takes place within the *ume kbubu*. 'Mother-roasting' or the post partum practice of heating up a woman's body (*lala koti*), is a compulsory treatment for women. *Lala koti* lasts for 4 day in the *ume kbubu*. In addition to lying close to the fire, the new mother has a hot water massage on her belly during the *lala koti* to release the *na mate* (dead blood) and *na muti* (white blood) from the womb. Such post-natal care is considered critical to ensure the safety of the mother and the child. Mathoes (65 years old) explains:

It is our ancestral custom to deliver a baby in *ume kbubu*. It is warm and we need fire to roast the mother and hot water to massage her stomach. We use traditional medicine not from the hospital. Roasting the mother and hot water massages are necessary to release the dirty blood and to put all the muscles and bones that move out from their position during the labor back into place. If not, the mother will get health problems and diseases in the future.

'Mother roasting' is common post natal care among communities across Indonesia (Frederick and Warden, 1993) and other parts of Asia such as Bangladesh, Thailand, Malaysia and China. It is considered to help regain health, strength and beauty after labor, restore the correct position of the womb, restore humoral balance, ensure fertility and prevent future illness (Whittaker, 1999).

Although the midwives at the Fatu Makono PHC encourage women to undergo this ritual in the *rumah sehat* by using charcoal, the mother and families consistently ignore their advice. Neni (midwife nurse, 32 years old) explains:

These rituals can be only done in the round house, not in the *rumah sehat*. Even when we advise them to roast in *rumah sehat* by using charcoal in a tray [they would not]. We told them that they need the warmth not the dust and smoke. But they still insist on living in the round house.

Other healing practices performed by traditional healers (*dukun*) mostly take place in *ume kbubu* as patients are said to need warmth and proximity to their ancestral ties to accelerate their healing. The association between *ume kbubu* and nurturing through life and death was revealed in the statement of Olli (69 years old):

I prefer to live here (*ume kbubu*). My mother bent down to bear me in this house. Her blood and flesh were dropped here when I was born. So I need to live close to mother's blood and flesh. Whenever I get sick…I always remember these things and feel better. I have an emotional memory with the *ume kbubu*. So…..If I die….my body should be laid down here in the *ume kbubu* before the funeral.

6. Conclusion

This study has examined the complex intersections between the cultural values of *ume kbubu* and the efforts to promote healthy dwellings for Dawan people in *Fatu Makono*. Table 1 provides a summary comparison of the characteristics, symbolic values and perceptions associated with the two types of housing in this study. In contrast to the recently introduced *rumah sehat*, *ume kbubu* are material representations of the ancestral ties, symbolic life and cultural heritage of the Dawan. Although cramped, poorly lit and smoky, *ume kbubu* are not viewed as unhealthy by most Dawan people in this study, but warm, nurturing, therapeutic spaces that enhance health and well-being. The warmth associated with *ume kbubu* and the 'friendly' smoke that accompanies it are positively viewed by many as being beneficial to health and crucial to household food security. In matrilineal Dawan society, *ume kbubu* are predominantly female spaces, associated with private family life, hearth, food and regeneration. They are associated with female nurturing and humoral warmth that is essential to fragile health states. They signify ancestral continuity, and ethnic identity.

Table 1
Summary comparison of characteristics and values associated with *ume kbubu* and *rumah sehat* according to Dawan informants.

Characteristic	*ume kbubu*	*rumah sehat*
Origin	Indigenous, traditional, ancestor's heritage	Non-indigenous, modern/colonial
Symbolic values	Family and social (ancestral) representation	No specific symbols
Gender authority	female/ matrilineal kin (Atoin anaf)	Male
Social function	Private/ nurturing space	Public space, nurturing guests
Spatial arrangement	Open space/ divided by gender/seniority	Partitioned room
Social hierarchy	Poorness/ low status	Wealthy, high status
Environmental conditions	dark, smoky, poor ventilation	Cold, clean, well ventilated
Perceived by health authorities	Unhealthy	Healthy
Perceived by local Dawan informants	Healthy	Unhealthy
Internal temperature	Warm	Cold
Rituals	Specific ritual with high cost	No specific rituals with low cost
Construction budget	Low budget (neighbors'/kin contribution)	High cost (personal budget)
Storage	Food preservation	Furniture, electrical appliances

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In contrast, *rumah sehat* are viewed by Dawan as cold dwellings with potentially harmful effects upon one's health. *Rumah sehat* are constructed as prestigious markers of wealth and modernity for guests and male public life, rather than homes.

The persistence of round houses as living therapeutic spaces underscores the critical importance of *ume kbubu* in local constructions of health and illness. Dawan notions of health, well-being and illness do not place emphasis upon environmental health factors, rather they indicate a belief that health depends on psychosocial factors such as happiness, economic achievement, social support, lifestyle and God's will. In contrast, local health authorities depict round houses as inherently risky for people's health, and blame a lack of education, irrationality, poverty, ignorance and resistance to change as the key reasons for the unpopularity of the *rumah sehat* as dwelling spaces. In this way, rather than strive to understand local reasoning and the importance of *ume kbubu* as social and cultural therapeutic places, ethnicity and poverty are aligned in official depictions with ignorance, resistance and a lack of 'development' (Hobart, 1993). Similar subtly racist characterizations of housing choices pervade housing interventions and policies among other groups such as Pacific peoples in New Zealand (Milne and Kearns, 1999) and Indigenous Australians (Neutze, 2000) and reinforce the complex histories of marginalization and discrimination of these peoples in dominant social, economic and political systems.

Despite health promotion attempts to displace them, *ume kbubu* remain an important part of Dawan people's identity in *Fatu Makono*. As the local people say, *haim monim aim mok maen uim kbubu*, "as long as we (the Dawan) are alive, *ume kbubu* will survive". The *ume kbubu* is an example of sustainable vernacular architecture that is environmentally adaptive, low cost, using locally-sourced materials and community labor, and culturally valued. In attempting to mimimise the health risks of smoke exposure within round houses, ignoring the symbolic significance of the *ume kbubu* and local perceptions of the benefits of smoke is counterproductive. Rather, participatory projects in consultation with the community to introduce locally sustainable modifications of biomass cooking technologies that minimize exposure to smoke (Bruce, 2000, p. 1087) and improve ventilation, or devising means to vent smoke to an additional smaller round house for food preservation, are possible design solutions. The use of sustainable design that is culturally sensitive to the needs of the dwellers and to its environmental and ecological impact, in conjunction with appropriate technology may create healthier and more comfortable living spaces for the community than those currently being promoted. The case study presented here highlights the contribution interdisciplinary approaches may make towards developing a holistic understanding of the complex relationship between housing conditions and health.

In 2010 the World Health Organization, in collaboration with a range of governments and agencies, began developing global guidelines for housing improvements to advance public health (2010). As more countries invest in housing interventions as a means to promote and protect public health, there is a need to ensure the potential benefits of housing programs are realized. This case study of the complexities in the adoption of "healthy housing" within this indigenous Dawan community has broader implications in that it highlights that such schemes may be ineffective without collaboration and guidance from local communities in their design and implementation.

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