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pacific families now and in the future: living the tokelauan way in new zealand

GINA PENE, PHILIPPA HOWDEN-CHAPMAN, MARISA PEITA,
HELEN VIGGERS AND JOHN GRAY

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**pacific families now and in the future:
living the tokelauan way in new zealand**
**teenagers' perspectives on extended-family living
and the evaluation of a purpose-built, extended
family house**

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HE FAKAFETAI

Ko te polokalame hukehuke iēnei na gālulue fakatahi ai te University of Otago, Wellington, te Housing New Zealand, ma te Fakalāpotopotoga a Tokelau i Ueligitone i ni tauhaga e lahi. Na mafai te polokalame hukehuke ona ko nā popōlega tau ki te ola mālōlō o tagata Tokelau e nonofo i nā fale nofo totogi. Ko nā fakafitāuli iēnei e lamatia ai te ola mālōlō lelei o tagata Tokelau ma e aofia ai:

- a) te tokalahi o nā tino o nā kāiga kae taikokole nā fale ma nā potu moe
- b) te hē fetai o te tuhiga o nā ata o nā fale ma manakoga ma aganuku a tagata Pahefika
- c) te hē māfanafana lelei o loto o nā fale.

I te pito a Tokelau, ko te faigā pāga ma te University of Otago School of Medicine ma te Housing New Zealand, na fakalagolago lahi lele ki nā tamana ma nā mātua mātutua, ona ko to lātou māmamalama ma te iloa i nā tūlaga tau te aganuku e fakatatau ki te fauga o nā fale Tokelau. E tokalahi ki lātou iēnei kua tākokoto mai i te tolia, ma kana hēai te lātou fehoahoani ātonu e hēki mafai ke iku manuia te polokalame hukehuke, tēnei kua lautogia ma iloa ai foki ia Tokelau i tona hao ki loto o he polokalame tāua lahi vēnei.

E hako ai te kupu, “Ko he toeaina ko lava ke i te mulivaka.” E hē mafai ke fakamalau atu nā igoa ona e tokalahi, kae ko nā fakamaumauga kua tuhituhia e uiga ki te polokalame hukehuke tēnei, ka kavea lava tenā ma fakamanatuga ki a te ki lātou uma ma a lātou gāluega lelei nae fai ke tautua ai ki fānau a Tokelau nei, ma i te lumanaki.

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Ioane S Teao, President, Wellington Tokelau Association

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AUTHORS' ROLES

Gina Pene assisted with the design of the study, liaised with the Tokelauan community, co-ordinated and carried out all interviews, helped with the focus groups, analysed the results and co-wrote the report.

Marisa Peita assisted with Tokelauan community liaison, conducted the interviews, facilitated the focus groups and commented on the report.

Philippa Howden-Chapman helped design the study, analysed the results and co-wrote the report. Helen Viggers analysed and reported post-occupancy data.

John Gray worked on the 'Tokelau House' design project as the 'design hand' of the Wellington Tokelau Association, analysed associated data and co-wrote the report.

EXECUTIVE SUMMARY

Background

Tokelauan people are proportionally one of the smallest Pacific groups in New Zealand and also one of the most socio-economically deprived. The Tokelauan community has a higher proportion of three-generation families living in one household than any other ethnic group in New Zealand, and consequently a high level of household crowding. Household crowding raises the risk of close-contact infectious diseases, such as skin diseases, rheumatic fever, tuberculosis and meningococcal disease, which occur at a higher rate in the Pacific community. (Baker, McNicholas et al 2000)

Study aims and design

The aims of the study were to understand how Tokelauan youth feel about living in extended-family households, and to describe their experiences of extended-family living and their understanding of its impact on their health and wellbeing.

The first part of this qualitative study, therefore, was designed to explore the impact on young Tokelauan people of living in extended families. With the support of the Wellington Tokelau Association we contacted 20 young people in the Hutt Valley and Porirua, who were currently living, or had lived, in extended families with grandparents.

The second part of the study evaluates the domestic experiences of a Tokelauan extended family, who originally lived in a conventional state house. They were selected, through an income and social allocation process, to live in a Housing New Zealand Corporation (HNZC) purpose-built extended-family house in Porirua. The design process and principles of the extended-family house are also described and analysed. We also interviewed all members of the family before and after they moved into the extended family house.

Interviews and focus groups, which were carried out in Tokelauan and English, were taped, transcribed and translated into English where necessary. We thematically analysed the texts separately and then discussed our findings.

Results

The young people had a predominantly broad view of health. They had lived, or were currently living, with their grandparents in households that often involved one or more other families; there was often considerable fluidity as to the people who lived in the house. All the young people said their grandparents had been very important in their upbringing.

A number of the young people said they had a great deal of autonomy as to whether they lived with their parents or grandparents, particularly in the holidays. All the grandparents were Tokelau-born and spoke fluent Tokelauan. The young people felt that living with their grandparents helped to improve their Tokelauan, even if they were not as fluent as them. They also learnt traditional values, such as showing respect and religious observation, from grandparents, as well as traditional craft skills. Indeed, several young people spoke explicitly about how they felt their grandparents had helped to shape their cultural identity, which was reinforced by their occasional trips back to Tokelau.

Several of the girls explained the differences between the behaviour of young people in Tokelau and New Zealand, stating that young people in Tokelau behaved more respectfully. Several of the young people wanted to bring up their children more traditionally, as their grandparents had been brought up. They also empathised with the sense of confinement, dependency and restrictions their grandparents faced in New Zealand compared to Tokelau.

However, a number also spoke of the disadvantages of living in extended families with their grandparents – mainly that their movements and behaviour were restricted and they were expected to do a lot of chores. Some young people expressed concern about the physical downsides of crowded households, including concerns about privacy, noise and smoking. Many commented on the poor state of the houses they lived in and had clear ideas of how they could be improved.

Evaluation of the extended-family house

Using the photovoice technique, we explored the pre- and post-occupancy experiences of the household.

The three-generational extended family were living in a relatively standard HNZN house, which highlighted the problems of crowding, with bottlenecks in the kitchen, bathroom and toilet. The house was so cold in winter that the household moved into the sitting room to sleep. It also lacked private space for doing homework and crafts.

After shifting into the new purpose-built extended-family house, which they found warm and spacious, the family felt happier and healthier. The children had room to play; the teenagers had space to do their homework and were doing better at school. The husband had returned to work after five years of unemployment. The family felt proud in their new home and liked to welcome their relatives and friends.

Conclusion

In general, the young people were very positive about living with their grandparents, but extended-family living can be diminished or enhanced by the built environment. The traditional New Zealand suburban bungalow is inappropriate for extended families. Properly designed social housing can achieve multiple objectives: it can increase the disposable income of families, and by allowing extended families who want to live together to do so, it can maintain minority languages across generations and improve the health and social wellbeing of family members. As New Zealand's population ages, the care and consideration received by grandparents in these households provides a very positive model of aged care.

1. INTRODUCTION

In Tokelau you have the support systems, your kaiga. Like your children could run everywhere and they can come back home. So you didn't realise until you came to New Zealand you're in isolation [in New Zealand]. You had your own home, maybe you had other members of your family, but you don't have that network that is tight, like living in the same area to your brother, sister, first cousin and so on. (Female community worker)

Migration is a brave personal experiment that helps researchers understand the social impact of different physical and cultural environments. For migrants, extended-family living is often an important cultural practice as well as an economic survival strategy. Tokelau is New Zealand's sole remaining colony, which places Tokelauan people living in New Zealand in the unique position of being both New Zealand citizens and migrants. Their migration highlights housing differences and the effects on extended-family living (Howden-Chapman et al, 2000).

Tokelauan people have a unique relationship with previous and current research teams, collaborating generously over many decades (Howden-Chapman & Woodward, 2001; Huntsman & Hooper, 1997; Wessen, Hopper, Huntsman, Prior, & Salmond, 1992). In this qualitative study, we explore the impact of extended-family housing on young people's wellbeing at a time of a unique cultural and historical nexus. All the young people we interviewed had the fortune of living with a generation of grandparents who, having spent the greater part of their life in Tokelau, were the first generation to migrate to New Zealand. Tokelauan is their mother tongue, and generally mother custom. As the Western world encroaches on the way of life in Tokelau, exemplified by such changes as an improved transport system and internet access, this situation is unlikely to recur.

1.1 Background

In 2001, the usually resident Tokelauan population in New Zealand was four times greater than the 1996 population count in Tokelau (6,204 compared with 1,507).¹ In 2006, Tokelauan people (6,819) were

the sixth-largest Pacific ethnic group in New Zealand (Statistics New Zealand, 2007b). The atolls – Nukunonu, Atafu and Fakaofu – were settled by different religious groups with different cultures and customs (Huntsman & Hooper, 1997). While outsiders might consider Tokelauan an adequate description, insiders would want to know which of the three atolls a Tokelauan is from in order to place them.

The Tokelauan community in New Zealand is centred in the Hutt Valley, where some of the earliest post-war state houses were built in Petone, Taita and Naenae (Viggers, Howden-Chapman, Day & Pierse, 2008), and subsequently East Porirua. Tokelauans are one of the most socio-economically deprived Pacific groups (Howden-Chapman et al, 2000). They were encouraged to come to New Zealand in the mid-1960s when a severe hurricane in Tokelau coincided with the need for industrial workers (Pene et al, 1999). Since the deregulation of the 1980s, their unemployment level has been about three times that of the total population (Statistics New Zealand, 2007b).

Like the Pacific population as a whole, the Tokelauan population is relatively young. The median age is half that of the total New Zealand population (19 years versus 36 years). Tokelauans have almost three times the incidence of extended-family living compared with any other ethnic group (37 percent compared with 10 percent for the general population). As our previous work has shown that Tokelauan teenagers were the group most ambivalent about living in extended families (Howden-Chapman et al, 2000), we were keen to understand more about their views of the impact of these living arrangements on their wellbeing and language acquisition.

Over two-thirds of Tokelauans are New Zealand-born. In 2006, 40 percent (2,505) of Tokelauan people could hold an everyday conversation in Tokelauan, a four percent increase since 2001 (Statistics New Zealand, 2007b). This language pattern differs somewhat from the usual pattern seen in migrant families, where the first generation is fluent in their native tongue, the second generation understands the language, but is less fluent and the third generation understands some of the language, but prefers not to speak it (Hulsen, De Bot & Weltens, 2002; Starks, 2006).

¹ <http://www.stats.govt.nz/analytical-reports/concerning-language-2004/introduction.htm>

1.2 Crowding and health

Our previous work has shown that many extended families live in crowded three-bedroom houses, in part to lower the rent per person (Baker, Goodyear, & Howden-Chapman, 2003; Howden-Chapman & Wilson, 2000). There have been policy debates about whether we should be concerned about this (Gray, 2001).²

Crowding is now regularly reported as a key progress-indicator in the Social Report (Ministry of Social Development, 2008). There is strong evidence that crowding increases the risk of close-contact infections, such as meningococcal disease, rheumatic fever, tuberculosis and skin disease (Baker et al, 2000; Baker et al, in press; Jaine, 2007; Das, Venugopal, & Michael, 2007; Baker, Das, Venugopal & Howden-Chapman, 2008). Rates of household crowding for Māori and Pacific peoples are double those for Europeans (Baker & Zhang, 2005). Crowding also increases the risk of being exposed to second-hand smoke (Howden-Chapman & Tobias, 2000), which irritates the airways and increases the risk of infectious diseases. Tokelauans have the highest prevalence of smoking of any Pacific group (Statistics New Zealand, 2007a), although there are encouraging indications of emerging household rules about not smoking inside (Howden-Chapman et al, 2000).

1.3 Study design

In 2007, we consulted with our community partners, the Wellington Tokelau Association, about this project. The Association fully supported it, as it was an extension of our previous work. Nonetheless, they raised important ethical and cultural considerations. Although the young people we interviewed were in some cases legally adults – that is, over 18 years old – we were asked to adhere to the Tokelauan custom of seeking the permission of parents before we contacted or interviewed the young people. (Indeed, in one case we had to stop an interview when the mother of a young adult objected to her son being interviewed.)

We then obtained an ethics agreement from the University of Otago Ethics Committee to seek a cross-section of 20 young people from the three atolls, who were living, or had previously lived, in extended families that included their grandparents. Most of these young people had parents who were both Tokelauan, but three young people had mothers of other ethnicities.

Using her knowledge of the Wellington Tokelau community, Gina Pene met with 10 key local people to explain the study and found them very supportive. She asked these informants to refer to the study teenagers who were 16 years and over and who had lived, or were currently living, with their grandparents.

We also re-contacted a second group of young adults in their twenties, who had previously lived in extended families and in some cases were still living with them. We had interviewed these young people in the mid-1990s when they were still in their teens, and we were now asked to reflect on their upbringing. We have reported these two different samples together as there was considerable overlap in their views, and it does not appear that attitudes have shifted significantly in the last decade.

Gina Pene and Marisa Peita carried out two focus groups with young Tokelauans in the Wellington region, one in the Hutt Valley and one in Porirua. Some young people, who for one reason or another did not attend the focus groups, were subsequently individually interviewed. Gaining the permission of parents and arranging these interviews took much longer than expected, because a number of the families did not have phones or their phone numbers were not listed in the phone book. Several interviews were scheduled and home visits made, but the young people were not at home. Furthermore, some of the interviews that were carried out revealed complex and difficult issues that affected the safety of all parties and required the adoption of different strategies.

In the focus groups, we aimed to get a mixed profile of age and experience in the people who had been living with their grandparents. This involved ensuring representation from each of the three atoll communities – Nukunonu, Atafu and Fakaofu. In the Hutt, where participants come predominantly from the Nukunonu community, we also focused on achieving a cross-section of teenagers from Petone through to Taita. In Porirua, we sought a similar cross-section of youth, as well as making sure that there was a mixture of teenagers from the three atolls.

In the Hutt Valley we recruited and confirmed 10 teenagers to attend the focus groups. They were offered a lift to the venue, but preferred to make their own arrangements. Four teenagers turned up to the event,

² A former chief executive of Housing New Zealand told a Parliamentary Select Committee that some people *chose* to live in overcrowded houses, even when offered alternatives: People chose to cram into state houses—chairman, *Waikato Times*. (27 August 1998) Hamilton. An extended family replied that living in such close quarters meant that illnesses inevitably got shared and that they liked the company, “but not in a place this small” (Manukia, J. (28 August 1998). Faces red over crowding claim. *New Zealand Herald*.

but two had to leave for other engagements. The focus group continued with two teenagers and is reported here in this way. When it became apparent that there were a number of issues that people did not want to talk about in front of their peers, we interviewed the remaining eight members of the focus group, who had agreed to be interviewed individually.

In Porirua, we arranged to pick up the teenagers, and five out of the 10 teenagers attended. Two said they would make their way there by themselves and three pulled out on the day. Three of these teenagers were interviewed individually. Despite repeated efforts it was not possible to interview the other two.

We carried out the focus groups and individual interviews in as culturally sensitive a manner as possible, accommodating both our participants' and their parents' wishes. Both the first and third authors are Tokelauan; the second and last authors are European. We were guided by current thinking about cross-cultural collaborations (Jones & Jenkins, 2008). All the interviews were carried out in English, except one that was carried out in both English and Tokelauan, and which was subsequently translated into English. All interviews were tape-recorded and transcribed. The first and second author read the interviews and thematically coded them independently and then discussed the themes, before jointly writing this report.

1.4 Evaluation of purpose-built HNZC extended-family house

In addition to the 20 interviews with teenagers, we interviewed the children living in a purpose-built extended-family house that had been designed as a special joint project by the Wellington Tokelau Association, John Gray (a community architect at the School of Architecture, Victoria University of Wellington) and Gina Pene and Philippa Howden-Chapman. The design process is described in Chapter 4. We also carried out a 'before and after' evaluation of the purpose-built house. The family was interviewed in their old house in 2007 and after they moved into the new house just before Christmas 2007; we interviewed them again in

their new house three months later in 2008. We used the technique of 'photovoice' – using photos taken by the participants to elicit their feelings about how they felt about their old house and their new purpose-built house.

Photovoice is a tool used in community-based participatory research to enable participants who are usually 'subjects' of research to take photos with disposable cameras in order to frame the issues they think are important and create social change by conveying them to policymakers (MacIntyre, 2003; Wang & Al, 2004). Photovoice is increasingly being modified to ensure it is culturally relevant, by building in an iterative process to ensure that it balances the power between the participants, researchers and policymakers; fosters trust; and builds capacity (Castleden, Garvin, & Huu-Ay-Aht First Nation, 2008). It has been successfully used to study parenting by disabled mothers (Booth & Booth, 2003) and with children and teenagers in a number of research projects in New Zealand (Marr, Rowe & Sinel, 2006).

After permission and approval were gained from the parents for the five children to participate in the study, each one was given a disposable camera and asked to photograph aspects of their old and new houses that were significant to them. We carried out the same procedure with the four adults in the household. After one week the disposable cameras were collected and the films were developed. The developed photos were given back to each member of the household to view, and so they could choose some for the photovoice interview. We conducted interviews with individual members of the household; each member discussed how they felt about the photos and the reasons they took them. These interviews were also recorded and transcribed.

The adult interviews were conducted in Tokelauan by Gena Pene then transcribed and translated. The children's interviews were carried out in English by Marisa Peita.

The family was assured of confidentiality, so only photos that the family has approved of have been included here.

2. TOKELAUAN YOUNG PEOPLE'S VIEWS

2.1 "How do you know when you're healthy?"

We began by asking the young people what health meant to them. They shared a broad, holistic view. Many had absorbed health education messages, but not necessarily acted on them:

Health means eating right, regular exercise and yeah, just stick to walking because I hardly exercise. (Young man)

Health means eating healthy food, regular exercise like walking to keep healthy. Making music makes me feel good and happy. (Young man)

How do you know when you are healthy?

Probably, in general, having a healthy lifestyle. It's an aspect of your life, not just your body, nutrition and all that stuff, but it has to be families and friends and whatever you get yourself into. It's kind of ... like balance ... so it can be like the fittest person for instance, but in terms of like anything with your family, I would not consider that healthy. You look healthy ... but in terms of family and associations and getting like how the family have their meetings and how they organise their minutia [get-togethers] and what not, that's if you are not participating. (Young man)

Several young people included both 'Western' and 'traditional' ideas along with having an awareness of exposure to risks that could affect their long-term health:

Good health means to me regular check-ups at the doctor to make sure you're alright and when you do feel that something is wrong with you that you do go to the doctor ... good health also means to me eating right and it also means, in the family sense, good communication with each other – that always keeps you healthy, state-of-mind stuff. (Young man)

Environment, healthy food – vegetables, fruits, some Island food, they're quite healthy, exercise. Environment as in air because some people are sensitive to some smell, the air ... when you have smokers that kind of environment. (Young woman)

2.2 "It's always been full, the house has never been empty"

The young people described the importance of living with their grandparents. Their presence epitomised the essential security of communal life. As children they had often shared their grandparents' bed, and they continued to value contact with them as they grew up:

Wherever the matua [grandparents] stay, that's where everyone would end up. (Young woman)

I think I was pretty much brought up by them, from day dot when I was born ... you know, the traditional Toke way, like the Māori as an example – whānau – children being brought up together in that sense – everyone is everyone's parents, everyone is everyone's dad. (Young man)

I stayed with my grandparents since I was born right up until I was about 10. Since then I've been going over there during the holidays, not so much weekends, but sometimes after school, and I can remember that I used to sleep with my grandparents when I was young, right up until I was about seven. (Young woman)

They all described full households, where grandparents lived with parents along with aunts, uncles and cousins, except for one young woman, who was the only child in a family of adults:

We lived in Upper Hutt. It wasn't just us, it was full. We had an uncle. It's always been full, the house has never been empty. (Young woman)

At the moment I'm living at home with my mum, dad, nana, my little brother, my mum's brother and his wife and their baby ... but I've also lived in Petone and the housing situation there was four bedrooms – nana and grandpa, auntie, uncle, great-grandmother and just heaps of cousins, about five or six cousins. But that house was like people coming and going and staying for a bit. (Young man)

I remember it only being a three-bedroom house – me, mummy, my sister and nana in one room and next door was my cousin and that was nana's room. The house was always full. It was like a train; everyone just kept coming and coming. It was good. I actually liked it – the house being full and having family there all the time. (Young woman)

There were four bedrooms and there were six of us – the grandparents, an auntie and an uncle, and two grandchildren. On the weekend the children would get dropped off at the grandparents' and stay the weekend. In the holidays, it would be more strongly, like everyone has more time to go there to stay. (Young man)

They spoke of the advantages of living in the same house as their parents and grandparents and the pleasures of having their relatives to stay and sharing food. They liked the continuity of relationships and having people around all the time:

That was a household full of people and all the adults and all grandchildren coming, always people in and out of the house, but there was also a lot of laughter and that's what I can remember. There was always laughter there. All the adults in the lounge and the kids asleep around them, it was fun. (Young woman)

Grandma and grandpa always had visitors. People were always coming over because grandpa would massage, like a healer. We did have a lot of people come into the home, family and friends come over, have conversations, even their siblings, my grandparents' siblings... Sundays there was always people coming over after church just for a chat, cup of coffee and then they take off. (Young woman)

I can't remember what age I was but I know I lived with them from a little child, maybe after one, two, we were living with nana and granddad. Mum and dad were living there also. We stayed with them for a while, so I slept with nana and granddad in their room. It had two double beds in their room. So it was me, nana and granddad in one bed and I can't remember who had the other bed and then we had other grandchildren sleeping in the other double bed. I slept with nana and granddad for ages and it was cool because we had great-grandma in the next room, that's why we had to share rooms. Mum and dad had a room. It was pretty cramped up, but it was a good feeling. It was nice to come home to a packed house and there was always a cooked meal because nana liked cooking ... we moved out eventually when we were at college, but then I moved back in with nana. (Young man)

The living arrangements were often quite fluid, with lots of comings and goings between the parents' and

grandparents' houses, particularly in the holidays, when garages were used as sleep-outs:

No, my parents had their own house and the people who lived with my grandparents was one of my uncles and I think my aunt's family – at the time she had only two kids that were both younger than me and they stayed there. They had their room with the two kids and I slept with my nana and papa and my uncle had his own room ... it was only until I started growing up and now to this day we've got heaps of little ones now and the house is always packed during the holidays. There's about 10 little kids running around the house and just the grandparents sitting in the chair just watching TV telling everyone to be quiet. If we do sleep over there, because I still got a room reserved there for me because I've always been there ... there's a garage now. We put rooms in there and now people come and stay in there. So there's heaps of room there now. (Young woman)

It was great and I didn't have any problems. I enjoyed living like that and we are still living in the same house [as] when granddad was alive... There's my mum and dad, my older brother and a few nephews. There are four bedrooms. I have my own room which is good. I play the keyboard and I usually go to my room and practise on the keyboard. I play the pate [traditional Tokelauan drum] as well. (Young man)

During the week there's me, my little brothers and my sister – she recently came back from the Islands; and in the weekend it's just my parents, my grandparents, my brothers and my sisters and my sister's baby. When it comes to the weekends, my aunts and my uncles, they bring all their kids and we're like all bunched up. (Young woman)

As some families moved away from the centres where Tokelauan families had settled, the contrast between extended-family living and nuclear-family life became marked:

We had some cousins who actually didn't grow up around her, the cousins from Napier. Some of the oldest kinda regret and say, 'Oh you guys are so lucky because you grew up around nana, you can understand her and when I come I'm so struggling to understand her.' She said she got a bit jealous or she's just gutted that she didn't grow up around nana. (Young woman)

2.3 “It shaped the person I am today”

There was a strong awareness of cultural transmission evident in the interviews. The young people spoke positively about what they had learnt from their grandparents. For example, two young men spoke of learning religious values and showing respect for their families:

Like being around grandparents, they were hard-out speaking Toke to you so that’s how I learnt how to speak Toke, and practising the Catholic faith as well ... like the customs as well, like respecting your aunties, you don’t swear, even though, like you don’t swear to your sisters or cousins, girl cousins, yeah just treating the females in high regard. So I learnt those kind of things being in a, sort of, overcrowded household. (Young man)

I thank them for bringing me up in that sort of environment because ... it shaped the person I am today, and being brought up in that sort of setting has made me see that family is key and family is the centre of your circle of life sort of thing. So you’ve got your family in the middle and then everything outside of that is, it’s important but not as important as the centre of the circle. (Young man)

Grandparents were often responsible for reinforcing traditional values, which involved morning and evening prayers, church attendance and abstinence from alcohol. Interestingly, in at least one household, smoking was deemed more acceptable than drinking alcohol:

...I just remember having a white and blue house and they used to yell at us from the balcony, across the whole street, you could hear her yelling our names out in Toke and all these kids would say, ‘Oh shame’. We had to come inside because it’s time for church. (Young woman)

Every Sunday you go to church, you don’t do anything else, it’s a day of rest but church, and even like, we have Sunday school so grandma encouraged me to participate in that, so you had lessons during the week as well ... to me she was, ‘No drinking in the house’; she didn’t mind the smoking because grandpa smoked but there was definitely no drinking. A lot of people had tried to say let’s have a party at your place but she’ll be ‘No,

no, you go have a drink somewhere else’, even her own kids. (Young woman)

Living with grandparents required flexibility, but despite some inevitable irritations, the young people liked it:

I stayed with nana while I was doing my course and mostly drove her up the wall. She used to hate it when I used to come home after 9 o’clock at night, but I used to tell her my course finishes at 9 pm. But those were the best years of my life, living with my grandparents. (Young man)

Their grandparents had helped to keep them well and massaged them when they got sick:

The only one time I remember being sick when I was living with grandparents, would have been at the age of four or five, it was like a fever and everything, and instead of taking me to the doctors, grandpa gave me the full-on massage and he always believed that lemon and honey that does wonders too. Then I moved back home with my parents and I was always getting sick. (Young woman)

The young people felt that living with their grandparents had helped them learn how to identify with Tokelauan culture and customs:

I would say if it wasn’t for my granddad, as well as my other grandparents – dad’s side I wouldn’t have my identity I guess, and I am grateful for having lived it with them. And they’ve shared everything that they know, whether it be our family tree or whatever, and that was one thing that granddad used to go on about and he’d take us right back. I just keep saying ‘God, I’m so thankful’. I just treasure those days with granddad. (Young woman)

They teach you what’s important about life, like money is good, but it’s not the main thing in life. They teach about how family comes first, not your friends, and stuff like that. (Young man)

The young people often had specific stories about what they liked. They described learning traditional cultural practices, and more often from their grandparents than parents. Several young men were taught weather patterns and fishing, the hauato (strings to hold the tuluma, the traditional wooden box, together). Indeed, one of the reasons that the Hutt Valley and East Porirua

have been favoured settlements for chain migration for Tokelau is that both are close to harbour fishing. This is one activity that can continue easily in both places:

They taught me a lot of stuff, especially my granddad – things like handicrafts, plaiting of the hauato [strings to hold the traditional wooden box together]. I got how to do that but I've forgotten how to do it now. (Young man)

It was helpful when I went over there and they taught us about the land and fishing and stuff. granddad is a really good fisherman when he was active but now he's just sitting at home. I think that's where I get my passion for fishing. Yeah, when he was younger he used to take me out. (Young man)

Some realised they had not taken full advantage of the opportunities available when they were younger:

I mean, it didn't interest me back then as it did a few years later when he was too old to go out. I wish I paid a bit more attention ... like weather patterns and stuff like that, I didn't really talk to him about it ... it would be really handy to know that sort of stuff, and not to have to look at the forecast... I remember when we did used to go, it used to be a good day every time, it didn't use to be blowing a gale or anything like that. (Young man)

The young women were taught how to make handicrafts, such as ili (fan) and lei (flower necklace); they were sometimes adaptations of Western crafts – a 'crocheting thingy'. They were taught how to make special food such as puta (doughnut). Both young men and women were taught fatele (songs):

We got taught songs. She tried to teach me how to make an ili but I struggled, and how to make the leis – she tried to show me how to make those. I remember her trying to teach me how to make an ili, even now she's trying to teach me how to make crochet thingy, even making the puta. I want to learn how to make the puta like she does but I don't have the knack for the kneading. That's why I always hang out with her, because I want to make the most of having her around. (Young woman)

I can't remember exactly how old I was when I lived with my granddad but I felt comfortable and had a good experience living with my granddad... I learned a lot of fatele, he used to tell me stories and

we used to have a great time singing those fatele together. (Young man)

The reciprocity they learnt was not only from one generation to another, but also between neighbours in the communities they lived in. One of the young women in Porirua spoke of sharing their fishing catch:

Most of the people that live in my street are Samoans. They're islanders and they understand.

So you get on with them?

Yep – just 'hi' and 'bye' ... exchange food. When my neighbours go fishing then they always come on Saturday and give us things and we always give them things ... that's what they do in Toke as well. (Young woman)

2.4 "I see Tokelau now just as a holiday place"

As other researchers have noted, there is a lot of travel by families back and forward between Tokelau and New Zealand (Wessen et al, 1992):

I was quite young when we first lived with nana and granddad and then we shifted back to Tokelau to live. We moved back to New Zealand when my nana got sick and my mother had to look after her. I also had to share my room. My aunties and uncles and cousins always come to visit and sometimes they stay over, so our house was always full of people. It was good having the cousins around. (Young woman)

The young people had strong memories of life in Tokelau and the differences between life in Tokelau and New Zealand:

Everyone was together in that sense like being together, interacting with the cousins, grandparents, aunties and uncles. I guess it's like forming relationships or keeping those bonds tied up, having fun, like cracking jokes and mucking around and playing. (Young man)

I stayed in a household – there were eight of us. There were six adults and three kids ... I grew up with them. Last year was when they left the house. I came back from Toke at the beginning of this year. You kind of see a difference because in Toke the houses are like out in the open, and

everyone shares everything but over here it's different because we've got bedrooms and you have your own privacy so that's the only difference but beyond that everything else is the same – respect. It's different when you're staying with your grandparents because respect is really important in a household and you don't really have your freedom to do whatever you want, for me personally you can't be free in your household knowing that you have grandparents. You've got to be careful, the things you say ... not [that] you can't speak your mind but the language, [not] the foul language. Manners is important. (Young woman)

Several young people thought that after visiting Tokelau, they could live in two cultures, but that New Zealand was their home:

I enjoy living the Tokelauan way in New Zealand. I see Tokelau now just as a holiday place, only because there's no future over there but my ideal will be the Tokelau way of living in New Zealand. It's all about the sharing – you're just closer with your family that way. (Young woman)

In the girls' focus group they analysed the different expectations. They felt young people were more respectful to older people in Tokelau and that this was partly a consequence of a much smaller society. They also noted that their older relatives were much less stressed in Tokelau than in New Zealand:

My one is like that [stressed] because we've got heaps of little kids and my grandparents, they stress a lot because they don't listen to them and like in Toke, it's different because it's a small community and everybody knows everybody and all the kids in Toke, they don't answer back like the little kids here, even to strangers. (Young woman)

When asked explicitly about which was the better way of living, several young people were quick to answer:

I would choose the Tokelau style. You have more respect for yourself and respect for others. (Young woman)

If someone in Toke tells you off, you listen. But over here if someone tells you it's like 'Who are you?' My grandparents don't stress a lot in Toke. If my little cousin goes out they don't stress a lot because they know they've got aunties and uncles out there to look after them, but over here it's like 'Where have

you been?' and my grandpa is like hard-out with that rule – girls aren't allowed out at night-times, only guys. (Young woman)

Interestingly, these girls also felt that young people grew up with less confidence in New Zealand as well as listening less to older people. They categorised this as 'bad' and the way children behave in Tokelau as 'cool, good':

The kids here, they are really shy and they tend to hold back but in Toke it's a different story – once you're told to do something, you do it, you have to serve. But over here it's like the youngsters would rather be hiding ... and over there they know what to do and what not to do but the kids here they just keep going. When you've got kids from Toke and they come here and they see us do what they don't do in Toke they think it's wrong and when we go to Toke and we see what they're doing it's like different. It's cool, good. (Young woman)

2.5 “I always want to be there for my nan”

Having been cared for by grandparents, the young people felt the responsibility to take care of their grandparents in turn:

Discipline was amazing. She was very good at looking after us, she has always been there for us, and that's what I'm quite happy about and I always want to be there for my nan. (Young woman)

Moreover, their grandparents were role models for the way they, in turn, wanted to bring up their children:

Yeah, it's like I'm trying to instil that into my son, the church thing isn't working yet. I'm trying my best to raise my child, nurture my child in a positive environment. He loves his grandparents and every opportunity he would go and stay with them because he just loves it there and the fact that there are other kids there. He's an only child and it's kinda repeating a cycle. (Young woman)

Some of the married young people felt that while they enjoyed a special relationship with their own children, they would still like to go back to live with their own parents, as their parents had done before them:

I think I'm used to the crowded houses and I love it. I think if we were to move out and stay on our own

it would probably take me a while to get used to. It would be lonely. My sister and her family, they've moved out and they've got their own property. They probably spend more time over here than they do in their own house, and they are forever here and that's every single day ... so I can picture myself doing that same thing. I don't think I could go anywhere without this family. (Young woman)

2.6 “When granddad moved in I got to learn the language more”

Some of the language patterns discussed earlier were evident in the interviews. The young people's grandparents' first language was Tokelauan:

Yeah, [my grandparents spoke] just the one language. I mean they speak basic English but we communicated in Tokelauan. But my aunts and uncle they speak both, so there was also English in the house as well. (Young woman)

Indeed, one of the major advantages of extended-family living, pointed out by several people, was that living and talking daily with their grandparents improved their Tokelauan:

At home it was mixed. To granddad it was just Tokelauan. Mum and dad were English-speakers, it was only granddad that would speak Tokelau, unless a rellie turned up from the islands and didn't know how to speak English, then we would have to speak Tokelau. That was another thing, that's how we picked up the Tokelauan language and that was through granddad, living with him. (Young woman)

The young people placed considerable value on being able to learn or continue to speak the Tokelau language:

That's why I want to teach my child its culture other than Māori and English. That's why I'm glad nana is still around and I want to have a child while she's still around so that they can hang around her lots and still try and gain that. (Young woman)

One young mother recognised the advantages of her grandfather only speaking Tokelauan, for three generations – her parents, her and her baby:

He's been back and forth from just family around New Zealand, and he only speaks Tokelau to everyone at home, so that's good ... it's good because this one here, he's learning how to speak

Tokelau too, and he's talking to granddad so that's good. (Young woman)

A young man, whom the interviewer complimented on his Tokelauan, also mentioned that the Tokelauan language was the predominant one spoken at home:

I prefer the Tokelau language and it is very important to me as well as the culture. Yes, we always speak Tokelau language at home. (Young man)

However, even when a number of other young people spoke about the advantages of living in a house with an extended family, a number of them mentioned that they still felt they missed out on speaking the language, because while they might understand the basics, they did not speak it well enough to fluently join in the conversations:

I've been living with him for about almost nine, 10 years now but I'm not fluent with the language, so that's the sort of barrier that me and him have. But we still communicate good enough. I mean, I can understand what he's trying to say to me and he can understand what I'm trying to say to him. We sort of mix and match the words to best describe to each other that we know the rest. (Young man)

We do have conversations out of what he wants or what I want or what we're doing at that moment but they don't really last for that long. I wish I could speak fluently, then I could talk to him properly, or sometimes I have questions that I want to ask but I can't, I don't know how to ask. (Young man)

I'm not as good as what I used to be but I can hold a conversation with her but when nana starts talking really really quickly, it's like 'Huh?' Or when she gets frustrated with you because you've used the wrong choice, the words aren't the greatest. (Young woman)

2.7 “They have their downside too”

While acknowledging the advantages of extended-family living, the young people also spoke about the disadvantages of living in a multi-generational household. Some had little free time, as they were required to look after their grandparents:

They're funny. You learn from them about the history of us. They have their downside too – a lot of chores, a lot of work. (Young man)

Most of my time with them, just staying home. During the holidays I didn't go out, I had to stay home and clean the house ... do their teas and coffees and all that sort of stuff. (Young woman)

When grandparents arrived from Tokelau, even greater adjustments were required by both their children and grandchildren, who thereafter had less time for each other:

My grandparents, they live in the Islands. They always travel and they've been here for a month now and I think this is the longest they've stayed with us because my grandpa is sick and they are going back soon. When they come over they always ... everything starts changing. My mum is like, hard-out stressed while my grandpa is here. To me it feels like my grandpa is like young, like little younger than me because I always have to check up on him and he is always in the room but when he's in the sitting room he's really quiet, and we always got to be like, 'Grandpa, are you alright, do you want anything?', but he always says – and it's hard to communicate with him, because I think I'm the only granddaughter that doesn't speak Tokelau to him and he gets angry when I don't speak Tokelau to him. I think that's the hardest – is communicating. (Young woman)

The adjustment was not easy for the older person either, since they had to try to adjust to a different, Western, urban society. The same young woman speaking in a focus group continued:

He doesn't like this lifestyle here ... he doesn't like the weather and he hates travelling in the cars. His exercise in Toke is swimming, but down here he can't do that because he's like stuck in the house. He walks to church and walks to his meetings in Toke and sits in the sun, but down here he's always in his room ... he hard-out misses his lifestyle in Toke. (Young woman)

Nonetheless, they sympathised with their grandparents being grumpy at having to migrate:

There are times when he wishes he was back in Tokelau and I feel sorry for him, but he says he wants to go back but then again he doesn't go back for some reason. His wife is over there. He can be grumpy some days and he has told us heaps of stories about when he was young, so that's good. (Young woman)

For young people who went away for a while and then returned to the extended family, there was also a shock at being re-immersed in family life:

It's different coming from living in a house with only three people in it, or two, and then you come home and I've discovered that I'm having to weave into how the house runs here; it's like an expressway, there's kids running around, it's downtime, quiet time, and they're all running around. Dad always keeps reminding me, you're living under our roof again and you've got to live under us and how we run the house. You know the TV is off at 7.30 to 8.30 because that's when all the study happens and the kids all try and get organised for school, and it's pretty hard for me to do that. I found it a little bit hard at first and at times I regret moving home but other times I don't because I just love being around my family. I tell my friends my family is my number one no matter what – they will always be here for me and friends may not be there for you but family will. I like being home, although we all have our ups and downs of bugging each other but that's just part of being a family ... someone just yells at the other one and makes the other one cry or just go to your room and chill out. (Young woman)

My house right now, everybody, most of them are in the sitting room. The rooms are packed but the oldies have their own room ... in a way it's cool, it's fun but then, come to think of it, it's kind of annoying at the same time, you want your own space. (Young woman)

A number of young people had concerns about privacy, noise and smoking:

We had bunks, they'd be in the sitting room – it could be anybody, family members, crashers, but it was never an issue. We used to love having everybody over. We had party sessions down there. It was dad, and he'll bring his friends over. So the house would be all smoky ... we got to a stage where we didn't enjoy dad's friends coming over. I would have loved to be able to hang out with dad more sort of thing. We were all scared of him and sometimes it's still like that. (Young woman)

The young people were asked how they dealt with tensions and conflicts in the households:

I like living in a large household, but when it gets too crowded, then I don't like it sometimes. I usually

go to my room and play on the keyboard and sometimes I talk to my mum or dad. I know it's not healthy keeping any problems and it's best to talk it over with someone. (Young man)

One of the areas of disagreement between generations was the definition of an adult, which was very different from that of Western society:

I think because I'm still seen as a child that it's sort of resolved with the adults or with my parents and my grandma and stuff like that. I don't know, the Tokelau mentality is anyone who's under 35 and single is not classed as an adult. So I see that they still see me as a kid, like a 10-year-old, and that I can't 'better' the dispute or the disagreement. So it's still being resolved from the adults. (Young man)

Some young people spoke of how things had changed now they were more mature in resolving problems or tensions:

I do get that sense now but it's, because I've gotten older, I cannot talk back to my grandma, but I can share my feelings so there's, not disagreements, but you know, ownership of feelings so I can, not disagree, but like just share how I'm feeling inside. It sort of changed the dynamic of a full-house setting but in a good way, in a mature sort of sense. (Young man)

2.8 “We can do better than this”

Reflecting the differences in climate, houses in Tokelau are very open compared with those in New Zealand (Howden-Chapman et al, 2000). Several times in the interviews the young people remembered what life was like when they or their parents first came to New Zealand. There seemed to have been fewer differences between lifestyle in Tokelau and New Zealand then.

I remember my mum saying when they first came here there was hardly any fences.

Can you cut through if you know the house?

Not any more.

I sometimes do that even if I don't know them. Everyone is putting up fences now. (Young man)

But, most of these families in New Zealand were living in houses designed for nuclear families rather than extended families, and many were clearly crowded. Some young people spoke explicitly about the poor standard of housing and how they coped with these issues:

But I'll never forget the home in Komata, the damp, the cold, that was horrible, and especially because there was quite a few of us. It was a good thing that most of us were in one room, the kids would be one room. We wouldn't use up all the rooms. Summer time was good you never really notice it. When it was hot it was really hot but you had moments when it was cold. So we'd all be in one room just to keep warm, and I believe it's because we lived by a creek. (Young woman)

One of the disadvantages of the inevitable lack of space was that there was less dedicated space in the house for family activities, such as eating at regular meal-times:

There's no set times to eat, they just eat whenever they're hungry. Even if they ate all day, yeah that's it. They don't have like breakfast, lunch and dinner. Nobody really sits at the table together when it gets crowded, because it's too small for everyone. It's like sit in the sitting room or on the couches. So you pick and choose the time you eat unless everyone else is eating. (Young woman)

When asked about their ideal house, some young people referred to marae-style housing, while others favoured Western-style housing:

My ideal house would be, and I prefer a New Zealand-design house and not so much the Tokelau style house – you know, where it's like a one huge room. (Young man)

Some wanted to retain the practice of living in an extended family, but knew that their current house was too small. One young man planned to go overseas, earn 'heaps of money', come back and extend his current family house:

There's still that homely feeling with like, 20 people in the house but it's ... I see a light at the end of the tunnel or like we can do better than this. (Young man)

The girls in the focus group in Porirua were aware of the purpose-built HNZC extended-family housing, and in general it fitted their view of an ideal house:

Spacious. The house that you were talking about, that's a really nice house because I'm close to them and that's a pretty [nice house], that kind of space. (Young woman)

3. EVALUATION OF AN EXISTING STATE HOUSE IN COMPARISON TO A PURPOSE-BUILT EXTENDED-FAMILY HOUSE

The Tokelauan teenagers interviewed about how they felt about living in extended-family households were generally positive about their experiences of living with their grandparents, but they highlighted problems of crowding and lack of space.

We undertook a photovoice evaluation of a purpose-built extended-family house purpose-built by Housing New Zealand Corporation (HNZC) to give us some indication of whether the expressed advantages for young people of living with grandparents could be enhanced, and the disadvantages minimised, through changes to housing design. As related earlier, the researchers had previously worked with the Wellington Tokelau Association and John Gray, an architect at Victoria University of Wellington, to design an extended-family house to meet the cultural needs of Tokelauan and other Pacific families.

Here we summarise the pre- and post-occupancy experiences of a selected household, while highlighting parallels with the earlier interviews with the young people in the Hutt Valley and Porirua. The family interviewed in this chapter were selected as a high-priority case from a list of extended families who were already on the HNZC waiting list to be moved into less crowded housing. The house they were living in, when they were selected by HNZC, was an ordinary HNZC house in the same area, which had had some basic modifications, but had not been extended. The policy of income-related rents meant they did not have to pay any more for the larger house when they shifted in.

The nine members of the household were interviewed separately on at least two occasions, but expressed largely similar feelings.

The father in particular highly valued living in an extended family, but had major health problems. The family was struggling financially:

Traditionally we do things together as a family; sharing and supporting each other, and I like it that way. To me it is alright living in a large household

providing it's a big house with lots of bedrooms and space. The most important thing is for the children to learn the culture from the elders. (Father)

We are struggling financially because we have only one income to feed a young family as well as pay the bills and it is very stressful. My husband is not in good health and is not able to work, so I was torn between wanting to stay home to look after my sick husband or to continue working full-time, but in the end I decided to continue working. (Mother)

The grandmother lived in the extended household, and consistent with the views of other young people in the focus groups, was treasured by the children. She also helped with the chores.

Before they shifted, the mother in the family, in particular, was concerned about the condition of the house they were renting. It was not their house of choice and she felt that living in it had caused health problems for her and her family:

When we moved to this house it was in a very poor condition, but because we were desperate to move into a bigger house for our growing family and also my husband was in poor health, that was why we accepted to move in to this house ... even though it was not really suitable for our large family, but it was better than the house we lived in before. Once we moved in we then discovered the poor state of the house – some part of the house was rotting – it was a cold and damp house. (Mother)

Sometimes you can feel the air is so heavy and it is a big concern especially for my family because we breathe this bad air which is not good for your health ... this house is very cold and damp, and there's mould on the wall ... it is worse in winter because it is too cold to open the windows. (Father)



The house is very damp and cold, even though the curtains are pulled, but it is still cold. Sometimes you can feel the dampness in the air and the air feels heavy and it does not feel right. The condensation on the wall – you can see the mould and I know it is not healthy. (Daughter)

Some days I find it difficult to breathe even though I do not have asthma but the air in this house feels so heavy at times. Often I have to ask my husband for us to go for a drive to the beach to get some fresh air – the feel of the sea breeze on my face helps a lot... I used to feel sorry and greatly concerned for the health of my children, especially as they were quite young at the time and they were always sick, especially in winter. (Mother)

The parents realised their household was crowded and they were concerned about the impact it was having. However, because the house was so cold, like many other New Zealand families, they just heated one room of their house and lived in it (Howden-Chapman et al, 2009). This exacerbated the crowding and lack of privacy:

The whole house is very cold in winter, especially the bedrooms, and it is easier to heat just one room [the lounge] than to try and heat the whole house. We have a heater in the hallway, but it is still cold. (Mother)

Because we share a small bedroom with three people and it is very difficult to breathe sometimes because there is not air, and I know it is not good for your health. (Niece)

They were also concerned about the shortage of bedrooms. The adults felt that three children in one small bedroom was too many:

There are nine in our family and only three bedrooms ... the children have to share, three in one bedroom. They are always complaining because it is too many in one room ... the lack of space and not enough bedrooms is a huge concern for me. (Father)

Our lounge is not only a lounge but also it is used as a dining room, sleeping area and study area for the children to do their homework. (Mother)

I share the bedroom with my nana and my cousin. This is a single bedroom but because it's a three-

bedroom house there aren't enough rooms for nine people in our household. This room is not really big enough to have double and single beds in it and unfortunately there is no alternative but to share this room with my nana and my cousin. (Daughter)

Because there are too many of us and only three bedrooms, I share the room with my granddaughters. (Grandmother)

There are nine people in our household and each bedroom is shared by three people and I know that's not healthy. My uncle has poor health and sometimes the lounge is then used as a bedroom. When we get visitors the problem is worse because sometimes they stay over, but there aren't enough bedrooms, so the lounge becomes a bedroom. (Niece)

The parents and grandmother felt that the quality of their family times together suffered as a consequence. The family could not share a meal together, nor could they have important family discussions:

Because our dining room is not big enough for a table to sit our family of nine people ... we have turns going to the table at meal-time because it is too small and the children usually go first. To me it is not healthy for our family because we should all sit down together at meal-times. (Mother)

Another problem for me is not being able to sit down together as a family to have a meal ... because the room is too small and it is very stressful. (Father)

This was an issue for the children too:

I took this picture of the kitchen because we didn't have enough space on the table for my whole family to have a feed and we always used to sit in the sitting room and let the older people sit on the table. (Son)

How did you feel about your family not being able to eat together? Looking at the picture, that's your dad sitting by himself, how do you feel about it?

Felt sad because we never used to sit on the table and have a family talk. (Son)

The mother worried that she was not maintaining her family's standards and would be looked down on by neighbours. They did not have a proper washing-line:

There wasn't enough room to hang on the washing-line and so we had to hang it on the fence... I felt shame ... because we just hang it on the fence instead of the washing-line. (Mother)

The grandmother felt that she could not do traditional handicrafts because there was not enough room, and that there were fewer family discussions because there was no space to sit down quietly together:

I feel we cannot function properly as a family because I want to have family discussions but there isn't the room ... the lounge is used as a bedroom ... I would love to do traditional Tokelau handicrafts in here but it is not possible because of the lack of space inside the house... I am very concerned for my grandchildren because of the lack of space for them to do their homework, so they use our bedroom. (Grandmother)



The parents were also worried that the crowding was affecting their children's education:

Because of the lack of space in this house the children do their homework in the lounge ... but sometimes it is not possible because it is also used as a bedroom. (Mother)

The parents' concerns were justified, as this quote from one of the children made clear:

It is very depressing at times because the room is too small to even have a desk or a table to put my schoolbooks on or to do my school work. I have to sit on the bed to do my study; as you can see it is hard to move around in this room because the space is taken up by the two beds. I wish there could be more space for me to do my study or have a desk or table in here. (Niece)

The children could not easily keep their rooms tidy:

There is also no space to store our clothes in our bedroom and we have to make do with whatever little space is available in this room. There is a cupboard but it cannot be accessed because one of the beds is right up against the cupboard and blocking it off, so the clothes are scattered around the room ... there is not much storage space in this house – there is only one linen cupboard in the hallway which I think is too small for a large family like ours. (Young woman)

Everybody in the household was concerned about the pressure on the bathroom and the one toilet in the house. It created a practical problem and was potentially embarrassing:

The other biggest problem is having only one toilet for our large household. The mornings in our household are very busy, chaotic and very stressful because everyone has to wait in line for their turn. (Mother)

The same with having only one bathroom, and the family goes through the same problems of waiting in line. To me it is not healthy for any family to live like that. (Father)

One huge problem is having only one toilet. It is so frustrating waiting in line for your turn. This problem is worse when we have visitors and I feel really ashamed. (Grandmother)

With only one toilet and one bathroom for a large household is very stressful for me. I do feel sorry for my nana if she has to wait for her turn, especially when the children either take their time or they play around in the bathroom. I know at times my nana gets annoyed and frustrated and sometimes it affects me because I do feel that nana should not have to put up with it. To me it is not a healthy situation because it can cause problems, especially as my nana is not in good health. (Niece)

Living in a large household, they also felt the lack of privacy:

I sometimes wish that I have my own bedroom ... because we are sharing one, sometimes I don't feel comfortable getting changed in the room. You try to use the bathroom but it's no good because it is too small. (Daughter)

Nonetheless, the family aspired to live together and saw that if they had a better-designed house they could live a more traditional Tokelauan lifestyle in New Zealand:

I know it may not be healthy living in a large household but I think as long as the house is big enough it is alright. It is our culture to live together like this, grow up together and do things together as well. I prefer to live like that because you get to know your grandchildren and vice versa and not only that, you get to teach them the Tokelau culture. (Grandmother)

Apart from the difficulties of the design and size of the house, the family was also worried about the location of the previous house, which was near a gang headquarters, and had some concerns about their safety. Nonetheless, they liked their neighbours and the sense of sharing what they had:

We get on well with other neighbours and sometimes we exchange food if we have any extras. (Mother)

I enjoy living here because the neighbours are very friendly. (Grandmother)

The photos the family took highlighted the pressure-points in the house: the kitchen, the sitting room, the bathroom and the laundry:

Took this picture of the kitchen because we didn't have enough space on the table for my whole family to have a feed and we always used to sit in the sitting room and let the older people sit on the table ... felt sad because we never used to sit on the table and have a family talk. (Niece)



This one is of the sitting room. I took it because it was little space for nine people in the family and it's a small sitting room, and you can't put any more furniture because it's too small. (Daughter)

The second photo I took because the fireplace was too small and it only warmed up the sitting room and not the other rooms. Some nights it gets cold and we just crash out in the sitting room and not in the rooms. (Son)

I took this picture of the bathroom because we never, we wake up in the morning there's always people wanting to go into the bathroom and we don't get enough time to get ready, and it's small. Yeah, it is a rush and everybody is angry and yelling sometimes. We always go late to school. My mum always goes late to work too, because we took too long in the bath ... made me feel sad because we always used to get into trouble from the teachers in front of everybody at school. (Son)

I took this picture of the laundry because it didn't have enough room and it wasn't big enough for our washing to fit in there.

Did you help out with the washing or not?

Yeah, when we're all at school my grandma does all the washing while we're at school. (Middle son)

They were also conscious that the condensation made the house mouldy:

Just not enough space and that. And the corner of the wall, on this side would get mouldy, like leaking, mouldy. In the mornings the windows would leak with water and the water would just drop on the floor but the windows are closed so we don't know how it gets in. (Son)

And I felt upset about this one because the only time in the morning when we wake up, water always comes down and drips on us while we're sleeping.

The water?

Yeah, like when it's a raining day water just comes through the window then drops down on us.

When it gets wet, does it get very smelly, musty?

Yes.

How does that make you feel? Does it take long to dry?

We always have to dry it with towels or something. (Son)



The children described the way they had to sleep:

He slept one way and I slept the other way.

What was it like, sleeping like that?

I felt squashed and didn't sleep very well ... we mostly sleep like this when visitors come to our house and we let them sleep in the room and we sleep in the sitting room.

How did you feel when that happens, when visitors come in and they take up your bedroom?

Felt annoyed.

Because?

Because they get a better sleep and we don't. (Son)

The children noticed the impact of their crowded household on their ability to do their homework:

Did you do your homework in the lounge or in your bedroom?

In the lounge.

How did you find that, when there are a lot of people in there, did you manage to do your homework?

Not all of it because it is too noisy. (Daughter)

Because I have to share the bedroom with my

other two younger brothers and I get really annoyed and frustrated sometimes, especially when I want to have some private time to myself or to do my homework. (Son)

As mentioned earlier, there were drainage problems with this house, which one of the daughters highlighted in a photo:

I took this photo because the gutter, the drain always overflows and gets all brown and yucky.

How will that affect your house and the people living in that house?

It could be the sewage or something.

Did it get smelly?

Yes.

When it gets flooded?

Yes, and that's why I took the photo. (Daughter)



The mother highlighted that this flooding was an ongoing problem, which had not only caused disagreements with a neighbour, but was also a source of ongoing frustration with their landlord:

One neighbour we fall out with when there's heavy rainfall around here, which happens often. They always blame us because the water and mud comes through our property and ends up on their property. I always report to HNZC that the drains are always blocked during heavy rainfall and they do come and check, but the problem is always there.

3.1 The new house

In December 2007, the purpose-built extended-family house was finished. After an opening ceremony, which included a blessing by the local Tokelauan Minister, Reverend Tui Sopoaga, and a speech by Lesley McTurk, the Chief Executive of Housing New Zealand, the family moved in.



The family's response to moving into the new house with open-plan, but also more private space, was overwhelmingly positive. By the time they were interviewed several months later, they felt their health had improved. The house had been designed to sleep 11, which meant that they were less crowded, and they appreciated the sense of space and light. There were fewer privacy issues and they felt that their family life had improved. They liked the neighbourhood much better and felt safer:

My health has improved a lot and I am now able to go to work to help out financially. I haven't been able to work for the last five years because of poor health. (Father)

It is lovely to see the improvement in my husband's health and I am very happy that he is now able to go to work to help out financially. It is very hard, especially with our children getting into their teens. (Mother)

The family's niece, who was part of the household, explained that after going to Tokelau for the Christmas break to visit her parents, she came back to the new house.

It was a really lovely surprise to find my family have moved here to this new house. I was hoping that this house would be ready when I return because I

did not want to go back and live in our old house. This new house is just awesome and a huge improvement in comparison to our previous house. I really like this house and it's so much better than the other house we use to live in. This house has lots of nice features – it's lovely and warm, heaps of space, more bedrooms, more bathrooms and toilets – it is fantastic.

I am grateful and happy that I do not have to share my bedroom with too many people like in the old house. It was very stressful for me sharing a bedroom like in the old house, but now I feel a lot happier and it is a much better environment. (Niece)

All the children spoke of their enjoyment of living in a nice new home. They found it less crowded and warmer. It had more space and places to store things:

Is it colder than your old house?

No, it's much warmer. Our sleeps are spot-on. It's better than our old house.

Is there more room?

Yeah – there's plenty of space. (Son)

The lounge is also much bigger with more space and it is not only bigger but it's much warmer also. The whole house is a lot warmer, which is really lovely, and it gets really hot in summer. We can now have more family gatherings in the lounge, which we could not do very often in our old house because it was too small. In our old house some would stay in the lounge and some would go to their rooms but we no longer have to do that here. The heat pump has made a huge difference, keeping the house warm in winter and cool in summer. It is lovely waking up in the mornings and the house is nice and warm. The younger children enjoy playing games inside the house because it has more room to move around here. (Niece)

This photo is our storage, storing our clothes and stuff. It comes in handy, less drawers and furniture are used in the rooms. (Daughter)

This one is of the kitchen – food storage. It's a good thing. In our old house there are separate cupboards but this one we can just keep them all together and stuff, easier to get things. (Son)

The kitchen is much bigger with more cupboards for storage space and a nice pantry in comparison to our old house; it was too small. The other feature in the kitchen that I really like is the big stove with lots of elements. Having a big stove like this one has made it more enjoyable helping out with the cooking because it does not take long to do the cooking and not too restricted with the number of people in the kitchen at any one time. (Mother)

This house has also more bedrooms than our old house [four bedrooms plus a study area which can also be used as a sleeping area if needed] but I do think it could do with a few more bedrooms because of the size our family. Some of us are getting into our teen years and need some privacy. I am grateful and happy that I do not have to share my bedroom with too many people like in the old house. It was very stressful for me sharing a bedroom like in the old house, but now I feel a lot happier and it is a much better environment. I enjoy having more privacy in here and I can also do my study in my room without too many disruptions – it's very blissful. I am delighted that my nana has her own bedroom but I do miss her company when we used to share a bedroom in the old house. It is lovely and warm upstairs in our bedrooms, so very different to the cold, damp and mouldy rooms in our old house. (Niece)

Everyone in the household had to learn how to use new modern household equipment. The father was in charge of heating and the mother was mastering the new larger stove:

I took this photo [heat pump] because it will keep us warm.

How is it going with the heat pump?

Good.

Have you figured out how to use it?

Only a little bit. (Son)

I took this picture because I didn't know how to use the oven. It's a cool oven. (Daughter)

Someone must know how to use it?

Yeah. It comes in handy, less power.

Have you lots of people come and stay?

Yeah.

Is it good for cooking big meals?

Yeah, for barbecues, and it cooks just right – not burnt.

So it's better than your last house?

Much better.

The children particularly appreciated the two bathrooms and three toilets:

The bathrooms come in handy because there's more hot water.

The showers used to run out in old house?

Yeah, the hot water. We don't have to wait for the person to finish, we can take two showers at a time. (Son)



The children spoke of better living standards in the new house, and when pressed said that they were getting better grades at school:

There's lots of space to walk around. (Son)

Is that a good thing?

Yeah, awesome. (Son)

What's good about it?

It's not tight like our old house. We're all separated; more places to work in and do our homework. (Daughter)

What's that picture of?

It's the printer, that's the computer table for my cousin to work on. (Son)

Where do you do your school work?

Anywhere, depending on where less noise is. (Daughter)

Have you been getting better grades at school?

A little bit. (Daughter)

The older children had just started going to college and were pleased with their progress:

So you were living there [old house] for a long time, Did you have to change school?

Them two. (Daughter, pointing at brothers)

How's that going?

We're going to separate colleges. (Brother)

It's a different college to last time?

I just started college this year. (Daughter)

It must be alright if your grades are getting better?

Yeah. (Daughter)

The family's niece was particularly delighted with the specially designed study space:

One of my favourite features in the house is the study area upstairs. I can now do my homework in peace and also have somewhere to put my school books, whereas in the old house I had to store them under the bed. Sometimes it is not possible to do my study in the study area, especially when the boys start playing around upstairs. I do get annoyed when this happens, but then at least it is not as bad as the old house because I can escape to my room and do my study there. (Niece)

The children spoke highly of other features of the new house's design, which they thought was much better than the house they had lived in before:

The design of the house is pretty cool. (Son)

This is the sliding door – it comes in handy for watching netball games if you don't want to go out in the rain.

Because it's just over the road?

Yeah, we just sit there and watch the netball. (Daughter)

I like the windows in the kitchen as well, the sliding windows.

The laundry – more space than the other one – more shelves in there, it's really good. My mum likes it. (Daughter)

The children were proud of their new home. They liked their family being able to offer hospitality to their wider family and friends:

It's a picture of the sitting room. I took it because it's bigger than our old house and it's good for visitors when they come – more space. (Daughter)

We've got two tables. If there's not enough room on this table we just go to the other one, or we can sit on the floor. (Son)

Is that better than your last house?

Yeah, it's better – more space to eat in. We can eat together as a family. (Son)

The family's niece was particularly articulate about the important consequences of the new house.

For example, she described how the new space had increased the amount of time spent in family discussions and games:

The kitchen/dining, it is great having an open-plan style as it suits a large family like ours. It is a lot better also because we can eat together as a family and we can have a big table in the dining area. Now during meal-times we can sit at the table and have family discussions, which to me are a good way of sharing any problems with the adults. In our old house we couldn't eat together as a family because the dining room was too small even after the renovation was completed – it could only fit a small table which sat only four people at a time. When we have visitors, traditionally the children have their meals before the adults. We also have no more problems when we have visitors because there is heaps more space for everyone, especially in the lounge and the dining area. Once the meals are completed then it is game-times for the adults; it is usually a game of domino. I have also noticed that the visitors enjoy visiting our new house and are always commenting on how nice the house is. (Niece)

Because there was more space inside the house, the children enjoyed playing and competing against each other – for example, by climbing the free-standing supporting pole and pretending it was a coconut tree:

Have you had lots of family gatherings?

Especially on Sundays, family things, just having a big feed. (Son)

Do they think it's their house too?

They make themselves at home. They like it.
(Daughter)

Do they come over more now than your old house?

Yeah. They stay longer. Sometimes they crash for the night. (Son)

How's that, do you like having lots of family, is it alright?

Yeah, good.

3.2 Suggestion for design improvements

Despite their very positive response to the new house, the family nonetheless had noted various design features of the house that they had not realised. In some cases their expectations may have been unrealistic:

I took this photo because my nana always has trouble walking down the stairs.

What should happen then if she has trouble?

Sleep downstairs but then she gets cold down there and there's no underground heating – we just found out about three days ago. (Son)

In some cases, there were relatively minor modifications that could be made:

The washing-line is not safe sometimes because it flicks off, and that's why mum tells nana not to do the washing. (Daughter)

In other cases, safety features such as latches on windows, which seemed to be affecting ventilation, would require further investigation:



I choose this picture because water always goes into Pete's room. It gets mouldy.

You've only been here a short time too?

Yeah. It's my mum's room that gets mouldy.

But not these ones up here, because you can open the windows?

Yep.

Can you open the windows downstairs?

Yeah, but it only goes out that long. But it's safe as well.

No-one coming to burgle your house?

Yeah. (Son)

The new house had been built on a rise on a relatively small back section, necessitating a steep drive, which caused some problems with taxi-drivers, who were called to the house frequently:

There are problems that we have come across with the house. The main one is the driveway – it is very dangerous especially for my nana, as she is getting on in age. The taxi-drivers refuse to bring their cars up the driveway because they said it is quite dangerous and it has caused some damages to their cars. The front door also is unsafe for my nana because it is too high for her to climb up onto the house – it was not designed very well. Because of the heavy rain during the past weeks it was like a small swimming pool in the front porch and we couldn't use the front door. The other problem is the bedrooms are not big enough. (Daughter)

I choose this picture because taxis always gets stuck – the driveway.

The back of the car always hits the concrete and they get angry when their car gets wrecked. The driveway is pretty tight as well, it's narrow.

So there's nowhere to turn around?

Yeah. They just stay here and wait for us to come out. That's when my dad goes to work.

The driveway out there got wrecked because of the rain. The bricks came off and the cars keep hitting it – the visitors. Sometimes the drain gets flooded. (Son)

3.3 Neighbourhood



Although the new house was only a few kilometres from their former house, the children were missing their old friends. This serves as a reminder that even when a move is largely positive for a family there are inevitable losses for some members. This was a key finding of the American evaluation of the rehousing programme Moving To Opportunity (Katz, Kling, & Liebman, 2001; Leventhal & Brooks-Gunn, 2003). When asked how they found the new neighbourhood in comparison to the old one, the children replied:

Pretty good, a bit boring.

Is it because it's a different neighbourhood?

Yeah, a quiet one.

So you said at the beginning it was a bit boring?

Yeah, because it's a quiet street.

What are your neighbours like, have you met them?

Some of our neighbours are bad and some good. Some people we don't get along. Our neighbours on that side, we get along really good.

Are they Islanders?

Māori. They bring food and we take food to them.

Is it different from your other neighbourhood?

Our neighbours in the old house, they used to come to our house.

While the niece also acknowledged the new street could be a little quiet, she was relieved to be away from the gang house:

Some of the neighbours around here are quiet – and some are not so friendly. I think it's because we are new to the neighbourhood. I like it here,

the location is spot on because it's very central to everything, ie shops, church and schools for some of the children. One other thing is the closeness to where I go for my course – I can walk there and back, which I enjoy. Unfortunately the new location does not suit everyone in our household in terms of travelling to work. I feel safe around this area also and we can go and play at the park, which is not very far from here. The Mongrel Mob lived not very far from our old house and I didn't feel safe at all walking home from the bus stop. (Niece)

In summary, the family was delighted with and appreciative of their new home, though it was understandably not perfect. The niece articulately summarised the improvements that she had seen in the family:

I do enjoy living in a three-generation household, especially with my nana. In our old house it was impossible to have a decent conversation with my auntie and uncle because of the lack of space. Now it is really good; we can all sit together in the lounge and I can have open discussions with my problems with them. I have noticed a huge difference, everyone is interacting more with each other since we moved to this house – I myself feel a lot happier living here in this house – lots of fresh air and lots of space. In the old house we were so overcrowded and it was quite depressing at times. It's good to see the children get on really well with each other – less fighting and squabbles. There is a huge improvement with everyone's health, especially my uncle. His health has improved a lot and he seems a lot happier too. On the whole I think it was a positive move for everyone and I am very happy. The only thing that saddens me is I don't have as much time of sharing with my nana like we used to in the old house because we do not share the same bedroom. (Niece)

There was some indication, however, that additional family members were joining the household on a semi-permanent basis, although the house they were living in had the flexibility to absorb extra relatives:

My older brother is staying here with us and the study area is used as a bedroom. This makes it hard for me to use the study area because they do not like the lights on too late as they cannot go to sleep. I sometimes wish I could have my own room like my nana. (Niece)

4. DESIGNING THE 'TOKELAU HOUSE'

In mid-December 2007, a gathering of people witnessed the opening of a new state house in Porirua, near Wellington. There were speeches, blessings, food, many smiles and a few damp cheeks, yet to the casual observer there would not have seemed anything particularly unusual about the house, or its site. Why the fuss? The celebration occurred because the house is unusual, but in ways that are hidden from external view – the way research established how the house should perform; the way the community was involved in its design; the unusually close collaboration between researchers and research-funding agencies, designers, community, council, contractors and the state owner; the fact that economic, health and sustainability issues drove the main decisions in the design of the house; and its interior (literally and figuratively speaking, what lies within the walls). The result is a house that departs from the standard New Zealand bungalow design in small but important ways. It looks like many others, but it works differently.

Among the community of people involved in its making, this place became known as the Tokelau House, in tacit recognition of the Wellington Tokelau Association's committed involvement in the early work of research and design. However, this innovative house was built as part of the Housing New Zealand housing stock, and while designed to take account of Tokelauan cultural requirements, the design also took account of the generic requirements of extended families. But there is also a broader agenda. While the house is intended to nurture a Tokelauan household, it is also an attempt to design for the cultural and functional needs of Pacific peoples more generally; for those living in large extended-family households, but re-situated in the New Zealand social, economic and physical context (Rensel & Rodman, 1997; Shaw, 1991). The opening of the Tokelau House marked a moment in a long and continuing line of thinking, research and action in the field of social housing in New Zealand, particularly the efforts to create affordable, healthy and appropriate housing for Pacific peoples living in New Zealand (Centre for Housing Research, 2007a; Howden-Chapman & Woodward, 2001). This is the story of that process, its results and the lessons learnt.

4.1 The problem with traditional New Zealand houses

Pre-1980s houses, typified by the three-bedroom bungalow, still make up the majority of the housing stock in New Zealand (King, 2003; Ministry for Culture and Heritage, 2008). Characteristically, these houses are constructed from lightweight timber stud construction lined internally with plasterboard and strip-timber flooring, enclosed externally with timber weatherboard or fibre-cement sheet-walls, a galvanised steel roof and small single-glazed timber windows. When constructed, such houses were uninsulated, which has earned them the tag of 'wooden tents'. In early times, space heating was limited to what warmth escaped from the kitchen range, so the kitchen was, not surprisingly, also the 'living room'. With the advent of the more heat-efficient electric or gas range, the living room (with its own open fireplace or solid-fuel heater) displaced the kitchen as the main family room. As the cost of solid fuel began to exceed the cost of electricity for heating, even the single fireplace disappeared, leaving the 'basic' New Zealand house without any systematic heating and still no means to retain heat. The accommodation, arranged as a collection of separate rooms connected by a passage and entry hall, comprised a combined living and dining room, a kitchen, a laundry, a bathroom, a toilet and the bedrooms. The total floor area was normally less than 100 square metres. The site was typically suburban, with grounds some eight to 10 times the area of the house, fenced, with a front garden and back yard and a garage at the back. A house in the typical suburban model faces the street, which is also the principal public space in suburban communities.

Apart from the twin problems of cold and damp (which can be solved, with some difficulty and expense, by a combination of insulation, heating and ventilation) (Bassett, 1996; Gray, 2004), this pattern of a three-bedroom house on its fenced suburban section was (and still is) reasonably well suited to the Western ideal of a family comprising two parents and two or three children living in their own private realm within a community of like-minded, but equally private, families. The bungalow together with its suburban lot formed what Ferguson termed "the New Zealand dream" in which the physical pattern was considered perfectly attuned to the household it supported (Ferguson, 1994). However, 30 to 90 years on, such traditional dwellings

³ The Tokelauan extended family that moved into the house met the dual criteria of household income and priority social allocation. Had there not been a Tokelauan extended family that met these criteria, the house would have been made available for an extended family of another ethnicity that did.

are increasingly unsuited to the spatial, functional, cultural and physiological needs of the contemporary households that occupy them (Altman, 1975; Centre for Housing Research, 2007b).

The widespread failure of traditional houses is only partly due to degraded or decayed building fabric, the outdated equipment to be found in older buildings and the pervasive cold and damp. These things remain very serious risk factors affecting people's health and wellbeing, but the main underlying cause of a mismatch between contemporary households and older houses is that new household structures and patterns of domestic life place unsustainable demands on the performance of traditional houses (Rapoport, 1969). The interior of a 1950s house, for instance, can be kept tolerable and healthy for a modest population of five or six people, provided there is someone mostly at home during the day to 'manage' the place, keeping it aired and moderately warm, putting the laundry out to dry and so on. The same house today is unmanageable and potentially unhealthy in the new circumstances of a large household (meaning more moisture generated by cooking, washing, breathing and heating), with everyone away most days or for most of each day (meaning that the house is locked up, windows closed, with less ventilation, and washing kept inside to dry because of the risk of theft if left outside), and with many people in close proximity to one another when the house is occupied (meaning a significantly increased risk of serious sickness) (Davis, Szigeti, & Gray 1993).

The problems that can arise from a mismatch between house and occupancy are compounded by poverty (Howden-Chapman, Crane, Baker, Cunningham, & Matheson, 2004). Affordability has always been a problem, but in New Zealand the gap between income available for housing and the cost of housing has been widening for decades. Since the older and smaller housing stock is also the cheapest available rental housing of any form (whether in public or private ownership, apartment or detached dwelling, urban or rural), such housing is the only choice open to the most socio-economically deprived households. In these circumstances, a natural response is to further populate the house in order to lower the rent per person, but there is strong evidence that the resulting overcrowding increases the risk of disease and close-contact infections such as meningococcal disease, rheumatic fever, tuberculosis and skin diseases (Baker et al, 2008). We also know that the cold, damp conditions that prevail in most New Zealand houses, but particularly uninsulated

and poorly heated older houses, greatly increase the risk of exacerbating asthma and hypothermia (Howden-Chapman, Signal, & Crane, 1999). The health and wellbeing problems resulting from cold and damp interiors occur across all sectors of the New Zealand population and in all parts of the country, but there is an increasingly disproportionate incidence of poor health and low income among Māori and Pacific populations (Blakely, Martin, Atkinson, Yeh, 2007).

To bring to light some of the problems that occur when a traditional bungalow originally designed for a nuclear family with one breadwinner is occupied by a large non-traditional household, we can consider the case of a three-bedroom house in the Wellington region, occupied by an extended Tokelauan family.

FIGURE 1: Typical three-bedroom suburban house



Photographer John Gray

Figure 1 shows a photograph and a diagrammatic floor plan of the house in its suburban setting. The plan illustrates the division of enclosed space into rooms: reading clockwise from the top left there is a lounge or living room (L), kitchen (K), laundry or washhouse (W), toilet and bathroom (T), three bedrooms (B) and a hall or passageway (P) linking all the rooms except the kitchen. There is a front door into the hall and a back door from the laundry. The lounge contains the one heater in the house, an inefficient solid-fuel stove. The kitchen contains a single-bowl sink and bench, a four-hob electric range with oven, a cupboard for food storage, space for a small refrigerator or fridge-freezer (approx 400 litre capacity) and some under-bench cupboards and drawers. The laundry comprises a trough and the necessary plumbing for the tenant to install a clothes-washer; outside there is a small drying line. Bathroom facilities comprise a bath with a shower over it and a hand-basin. There is a single toilet separate from the bathroom. The gross floor area of the dwelling is 84 square metres.

This house was home to an extended-family household of nine people of three generations. As related earlier in

the evaluation results, the conditions encountered by the household were cold, damp, lack of space for people and belongings, limited facilities and various constraints resulting from the cellular layout. These conditions, when combined with a household of this composition and cultural background, result in a raft of difficulties in everyday living and various hazards to physiological, psychological and economic health. A particularly insidious consequence of this situation is the inhibiting effect it has on the intellectual and social development of the children in the household. Table 1 presents a summary of the relationships between the physical attributes of the case study dwelling, the behaviour and activities of its occupants and the risks and negative effects of the situation on the wellbeing of the household.

The issues listed in this table have been compiled from findings generated by:

- > The research partnership of Wellington Tokelau Association and the University of Otago, Wellington's *He Kainga Oranga: Housing and Health Research Programme* (focus groups and survey).
- > The Community Action phase of the 'Tokelau House' design project (community workshops).
- > The youth focus groups and interviews, and occupant evaluation conducted by Gina Pene and Marisa Peita.
- > Literature on public health in relation to housing (Howden-Chapman, 2004; Howden-Chapman et al, 2007).

TABLE 1: Relation between physical attributes, behaviour and risk

Physical attribute	Behaviours/results	Risk/negative effects
Size of whole building	Crowding (9.3m ² /person; av. 3 persons/bedroom); reduced children's play; reduced hosting	Increased risk of close-contact infections Reduced learning through play Reduced socialisation and family meetings
Size and layout of kitchen	Crowding, or solo use of kitchen	Increased risk of accident Reduced opportunity for shared work, for child/parent relation-building and learning
Size and layout of bedrooms	Crowding, added intensity and frequency of interactions among people sharing bedrooms	Distraction from homework Loss of sleep, and sleep quality, with consequences of reduced attention and focus on schooling or work Interpersonal stress Inappropriate gender/age mixing Lack of appropriate privacy
Size and arrangement of living room(s)	Crowding; low-level or no hosting because of lack of space and/or loss of pride	Increased risk of exposure to cigarette smoke Isolation from community
Hygrothermal conditions: cold, including (lack of) insulation; moisture/damp indoors; mould	Crowding in the one room with a heater; sleeping in the living room; closing all windows even when ventilation is needed, resulting in a build-up of moisture inside; high proportion of household income spent on heating OR insufficient heating; high temperature differential between parts of the house; responses to discomfort due to radiant heat loss and low air temperature	Increased risk of close-contact infections Distraction from homework by other people (in warmest room), or reluctance to work in cold bedroom Increased physiological stress moving from bed to bathroom or heated to non-heated rooms Increased risk of hypothermia Increased risk of respiratory disease from cold and damp

Layout of house into separate (private, small) rooms; window and perimeter security	Potential seclusion or isolation of household members (particularly children), resulting in difficulty or impossibility of surveillance; antisocial behaviours including absconding; washing dried inside because of risk of theft from outside lines, lack of ventilation inside	Increased risk to personal safety from unauthorised absences from home, increased opportunity for anti-social behaviour Stress (to parents and grandparents) from lack of surveillance and control Increased risk of illness from mould/damp
Facilities and equipment: cooking, storage, laundering, toilet and bathroom; ventilation	Long waiting times for bathroom and toilet facilities resulting in being late for work/school; inadequate cooking processes with small stove/large pots; continued cultural behaviours despite a lack of appropriate facilities; reluctance to host visitors, relatives	Stress Activity curtailed by lack of storage and other space Increased risk from accident (eg, burns) Potential health risk from undercooked food Increased risk of illness from mould/damp Isolation from community and relatives

(Based on Keall, Baker, Howden-Chapman, Cunningham, & Ormandy, in review)

Despite the negative effects outlined above, there are numerous advantages in extended-family living, even in difficult circumstances. It was clear to everyone involved in the Tokelau House project that the positive aspects of extended-family living should be maintained by developing new ways of living or new domestic environments for living. These advantages and cultural preferences include opportunities for family 'togetherness', including sharing food together as a family, and the regular 'fluid' exchange of abode among cousins and other relatives in the wider family circle; language acquisition through grandparents living with young grandchildren; security and self-confidence arising from close familial and communal life; the passing-on of strong cultural and spiritual values that occurs within a cohesive and large household community; and a sense of care and respect for the elderly.

The brief for designing and building a house suitable for a Tokelauan (or other Pacific) household living in the New Zealand climate and social context we agreed may be summarised thus:

To enable the positive attributes of extended-family living while avoiding or reducing the health and wellbeing problems that can arise from having to make do in a small traditional uninsulated house.

With a generous budget this goal is not hard to achieve: one has simply to provide a lot of well-appointed space that is well-insulated, ventilated and heated. But of course budgets for social housing are very constrained, both in terms of capital expenditure and operating expenses, for both the owner and tenants. In fact, budgets and rentals are based, with little change, on the very standards that have prevailed through many changes in the political arena and many generations of public housing in New Zealand, and that have been found wanting. So, to the occupant household's requirements outlined above we must add the state's techno-economic side of the equation for the Tokelau House experiment:

To develop architectural design solutions and mechanisms that can be employed to keep a house warm and dry in the New Zealand climate, even when crowded, without recourse to mechanical ventilation, at minimum operating cost to the occupants and within HNZC guidelines for capital and maintenance expenditure.

The remainder of this chapter is a description of methods and intended outcomes involved in attempting to meet this difficult brief.

4.2 The Tokelau House design process

The project was devised as a practical way to demonstrate that attention to health issues would, and should, influence the design of a house, and that a well-designed house would provide a significantly healthier environment (Lawrence, 1995; Porteous, 1992). A key aspect of the approach was a commitment to partnerships between researchers in public health and architecture, owners or providers and the community (Matheson, Howden-Chapman, & Dew, 2005). In this model, the participants joined forces in looking at structural factors affecting health, pathways through which such material matters influence health and pathways for realising viable housing solutions that reduce the hazards to health. The project formed part of the University of Otago, Wellington's *He Kainga Oranga: Housing and Health Research Programme*. Other partners in the project were the Wellington Tokelau Association; Housing New Zealand Corporation (HNZC); and the Centre for Building Performance Research at Victoria University of Wellington. Funding for research was provided by the New Zealand Health Research Council and the Families Commission.

The partners in the project adopted an action research model – an approach that treats knowledge as power and removes the line between research and social action (Sanoff, 2000). The Tokelau Housing and Health project began as a research partnership between the Wellington Tokelau Association and the University of Otago, Wellington's *He Kainga Oranga: Housing and Health Research Programme* whose activity consisted of seven focus groups designed to determine what physical, financial and social aspects of housing, in the view of the Tokelau community, were most likely to affect the health of the household and the wider community. The focus groups consisted of elderly men, elderly women, teenagers, single mothers, community workers, tenants and owners. The focus group discussions were followed by a survey of 150 households, involving interviews with 600 people. The findings from the survey and focus groups were relayed back to the community and further discussed at an open forum.

The design process began in phase two of the Tokelau Housing and Health project and centred on a series of workshops, known as Community Action, between the research team comprising health researchers and architects, and a representative group from the Tokelauan community in Wellington, where the proposed demonstration house was to be constructed. The

workshops dealt with three phases in the design of a house: firstly, a briefing phase in which the quantitative and qualitative requirements were established; secondly, an initial design phase involving an exchange of design ideas; and finally an evaluative phase, during which designs developed by the architects were discussed and refined (Figure 2).

FIGURE 2: A participatory design review meeting



The photo shows part of a group of representatives from the Wellington Tokelau Association discussing an early design scheme with members of the research team and project managers from HNZC. The review process was aided by the use of a large-scale model (centre right), which could be dismantled and reassembled during the discussion.

As a result of this particular meeting, and others like it, some 'expert' assumptions and ideas were revisited, leading in the end to a house design better aligned with the community's needs and preferences.

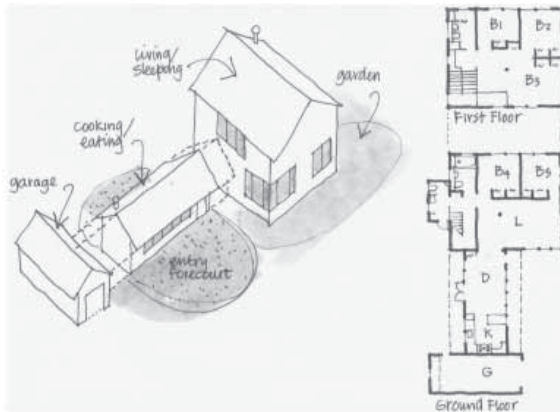
4.3 The Tokelau House design strategies

Figure 3 shows that the house is organised into three main connected components: a garage; a kitchen, dining and entry space; and a two-storey block containing the living quarters. This arrangement utilises several related strategies designed to keep the interior warm and dry even if the windows are kept closed, even if the house is crowded and without recourse to a mechanical ventilation system (the latter a HNZC directive). The 'keep-warm-and-dry' strategies include:

- > maximum separation of 'wet' rooms from 'dry' habitable areas
- > passive ventilation devices including a wind-powered ventilation 'chimney' next to the bathrooms, 'trickle vents' in windows and a front door situated to form a ventilating curtain of air

- > occasional (but deliberate) overheating from solar gain to 'encourage' occupants to open the upstairs windows in order to occasionally purge the building of any moisture build-up
- > cross-ventilation in the kitchen and dining area
- > extra-insulated walls, floor and ceiling, together with selected double-glazed windows
- > efficient heat-pump heating, plus solar gain through north-and west-facing windows.

FIGURE 3: The Tokelau House: aerial view and floor plans



Other design strategies and solutions had to be developed to provide for the range of requirements that mark the differences between Western-style housing and Pacific housing needs. Many of these differences and special measures can be observed in the 'walkthrough' description of the house that follows.

4.4 'Walkthrough' discussion of the main design features

FIGURE 4.1: Main approach exterior view



Photographer (of all photographs in 'walkthrough' series)
John Gray

This view is from the north-west, looking at the main entry:

- > A large entry forecourt provides for formal welcomes and gatherings, plus children's play. The garage (out of view to the left) can be utilised for provisions and 'back-of-house' work on special occasions.
- > Verandas on both east and west sides of the single-storey kitchen-dining 'wing' allow sitting or playing in the sun or shade or shelter (depending on the time of day and weather).
- > The entry door is located between formal and informal living spaces, allowing for selective welcome to either.
- > The house is deliberately unassertive and 'ordinary' to fit the neighbourhood.

FIGURE 4.2: Main approach exterior view



- > Coral collected from one of the atolls, incorporated into a front door 'mat' as a precious reminder of home.

FIGURE 4.3: Kitchen and dining windows and doors



- > The left-hand end of this long narrow space houses the kitchen. Here we see the space set aside for a large table. Windows and ranch-slider doors run along each side of the space. A table could be taken outside through the large opening provided by the doors.
- > If necessary, a coffin could be carried into and out of the house with dignity.
- > A sense of airiness (and literal air-flow over the skin) is important to Pacific people – the operable

windows allow plenty of air movement across the room.

- > The glazed walls on both sides are reminiscent of the openness of Island 'houses without walls' and the separation of kitchen from house.
- > The kitchen is a 'command-post' allowing good surveillance and supervision of young children at play inside and outside.

FIGURE 4.4: Kitchen (the business end)



- > Important attributes of the kitchen are the wide stove, the generous space, good-quality materials, a kitchen table and good ventilation.
- > The stove is 900mm wide, gas-fired via bottles. The wider-than-usual stove is important because it accommodates larger-than-usual pots. On a standard 600-wide four-burner hob the pots may be perched part-on and part-off the burners, resulting in uneven cooking, and causing a potential risk of accidental burns.
- > The space in this kitchen, and the width of the stove, allows for more than one person to take part in the preparation, cooking and serving of food, with attendant benefits to learning and family relationships.
- > Materials (stainless steel bench, polished concrete floor etc) are above minimum standard for hygiene and durability.

- > The kitchen includes a fixed bench at table height (seen in the foreground of the picture). This doubles as a bench and a table. Not all tenants can immediately afford a dining table; some own a standard-sized table that is too small for the whole household to eat at the same time. This inexpensive added 'table' can make the difference between having to operate 'sittings' and eating together.

FIGURE 4.5: Garage interior



- > The garage is lined, the floor is semi-polished and there is a storage ledge at the end. This space is expected to serve more than car-storage functions, including overflow accommodation for visitors (or family who make way for visitors in the house), plus housing occasional meetings and other events.

FIGURE 4.6: Living-room interior



- > This is the main living area, looking from the doorway to the stairs towards the north-and west-facing windows. The room, like all downstairs areas, has a polished concrete floor, which makes for easier cleaning and avoids dustmites commonly found in carpet.
- > In normal use, and suitably furnished, this space can accommodate the household for games, watching TV and meetings, but it may at times be used for more formal occasions, or to accommodate guests staying over.

- > Two of the four bedrooms and one dormitory are accessed from this living room (to the left in this view), as part of a flexible range of possible combinations of sleeping arrangements for the household.

FIGURE 4.7: View of living room from stair-landing



- > Openness, characterised by the phrase 'houses without walls', is a defining quality of traditional Tokelauan architecture. In this design the opportunity was seized to open (vertically connect) part of the living area with the dormitory space above. This view from the stair-landing shows the resulting two-storey 'well' for light, air and internal views.
- > Some heat from the lower living space rises to the upper floor through this well, to be returned to the living room below if desired via a fan-assisted duct.
- > Parental surveillance of children is assisted by the opening between the lower and upper floor of the main living quarters.

FIGURE 4.8: Part of first-floor dormitory space

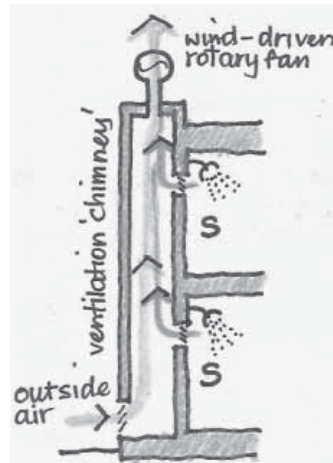


- > The dormitory, an open space upstairs off which two more bedrooms are located, is an adaptable area – one end for one or two regular sleeping

spaces, also useful as an indoor play area, and as a large area for guests to sleep.

- > This view looks towards an area at the top of the stairs for a computer and homework station.

FIGURE 4.9: Bathroom ventilation system



- > Two bathrooms are provided for the household, plus a third separate toilet. The bathrooms are located one above the other off the stairwell, conveniently located in relation to the bedrooms, but separated from the habitable spaces by doors and distance to reduce the migration of moisture.
- > There are operable windows in the bathrooms, but on the assumption that they are frequently not used for ventilation, a system of passive ventilation was devised. Each shower compartment (see photo) has a vent that leads to a ventilation 'chimney' alongside the bathrooms, on top of which sits a wind-driven rotary fan. The fan draws air through the chimney, helped by the stack effect caused by the difference in temperature of inside and outside air. The idea is to draw moist air from the bathrooms and discharge it above the roof of the house.

4.5 Design conclusions

This discussion of the Tokelau House project has provided an overview of the design intentions and mechanisms that were adopted in a concerted team effort to meet the dual demands of an extended-family Pacific household living in New Zealand (particularly relief from cold, damp and lack of space), and the state landlord for social housing, HNZN Ventilation,

insulation, heating and space remain the most important design variables in achieving healthy and culturally appropriate housing, but also the most difficult to resolve in the context of large households, crowding and tight budgets. An initial post occupancy assessment has been undertaken, and initial results of indoor and outdoor temperature are presented in Appendix C, but first indications are that the science is right, and the goals are achievable – just.

5. CONCLUSIONS

Tokelauan people living in New Zealand are a culturally rich but socio-economically deprived population. They have maintained their pattern of living in extended-family houses, despite the ill-fitting houses available to them and the continuing problems of relatively high unemployment rates, crowding and risky behaviour such as smoking.

The 20 young people interviewed for this study were nonetheless very positive about their experiences of living in an extended-family household. They valued the opportunity to learn and speak Tokelauan. Indeed, the high levels of fluency in the Tokelauan community may well be related to young people living with their grandparents. Linguistic research has shown that contact with native speakers is a key factor in language maintenance (Hulsen et al, 2002). Moreover, children who are bilingual, particularly if it is fostered through a community empowerment model, have better educational performance (Thorns, 1988).

The young people enjoyed their grandparents' attention and learning Tokelauan customs. Risky teenage behaviour, such as staying out late, smoking and drinking, were often curtailed by grandparents. Having benefited from their grandparents' care, many inherited a strong sense of reciprocity and obligation to return 'the gift'. Mauss described this reciprocity as a strong feature of Polynesian society (Mauss, 1954). Considered through the instrumental lens of altruism economics, their parents and grandparents modelled unselfish behaviour, from which they hoped to benefit in turn (Stark, 1999).

While the young people liked the general level of household activity, they disliked aspects of crowding, such as the lack of privacy that deprived them of time they valued with their parents, or space to quietly study. Their clear preference was to continue living with their extended families, but in properly designed houses that allowed for communal activities, as well as private activities such as studying and sleeping.

HNZC's Healthy Housing Programme has already pioneered extending the size of the standard state houses to accommodate extended families, and we have worked with architects, HNZC and the community to design an exemplary extended-family house in Porirua. The additional five children and four adults we

interviewed before and after the shift raised the same issues beforehand as the other young people: crowded households raised the tension level and made daily life difficult. Nevertheless, they all valued extended-family living and when they had the opportunity to move into a purpose-built house in the same neighbourhood, stress in the household reduced and the health of several members improved markedly. The children reported they were doing better at school and the whole family enjoyed having more space to play, study and welcome visitors.

The purpose-built extended-family house was designed in consultation with the Tokelauan community to address the design flaws of the conventional three-bedroom state house. The extended-family house was designed to increase space and set aside specified areas for studying and socialising, while employing innovative design solutions for heating and ventilation.

The pre- and post-occupancy evaluation of this extended-family house has the limitations and strengths of any single comparative case study. The family was the same in both houses – it was the structure of the house that changed. This enables us to see the impact of the built environment in a vivid, visual way. Though this report details the family's subjective responses, it is supplemented by photos taken by family members. Subjective feelings of wellbeing are important predictors of health and life satisfaction. These have been supplemented by some initial measures of the new house's physical performance. Indeed, post-occupancy analysis of indoor and outdoor temperature shows that the house maintained good indoor temperatures within the range recommended by the World Health Organisation. At the time of the post-occupancy interviews, the family had only been living in the house for about six months. Ideally we would continue to monitor their progress, but this needs to be balanced against the occupants wishes to preserve privacy.

Photovoice enabled us to gather a graphic idea of the frustrations and the pleasures of inadequate and adequate aspects of housing. Together with the family's explanations of specific design features, which could be prompted by the photos they had taken, the evaluation provided a rich picture of extended-family living and how it can be diminished or enhanced by the built environment. This case study demonstrated that properly designed social housing can achieve multiple

objectives. By providing good-quality, appropriate housing at a reasonable cost, it can increase the disposable income of families; and by allowing extended families who want to do so to live together, it can maintain minority languages across generations as well as improve the health and social wellbeing of

family members. As our population ages, the care and consideration received by grandparents in these households provides a very positive model of aged care. This project also shows it is possible to have the undoubted benefits of extended-family living, without the burden of infectious diseases and

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APPENDIX A:

Mechanisms used in response to health hazards in a large household

System	Health hazard	Mechanism adopted	Expected result
Size of whole building	> Cold	> Extra-insulated floor, walls and roof	> Retained warmth
	> Damp and mould	> Double glazing (habitable rooms and bathrooms)	> Reduced radiant heat loss (from the body to cold surfaces)
	> Stress (financial)		> Reduced energy cost
Heating	> Cold	> Solar gain (sun-facing windows)	> Warmth (appropriate air temperature)
	> Damp and mould	> Heat pump including filter	> Dryness (in conjunction with heat-assisted ventilation, and avoidance of moisture producing heaters)
	> Dust	> Heat transfer duct including filter	> Filtration (reduced dust)
	> Poisons, pollutants, VOCs, allergens	> Fan heater (bathroom)	> Air movement (stack effect, fans)
		> Stack effect (chimney + vent)	
Materials	> Poisons, VOCs and pollutants	> Concrete (polished semi-smooth finish) throughout ground floor, including two bedrooms	> Minimal off-gassing, VOCs
	> Infections and hygiene	> Stainless steel bench tops	> Minimal dust and dust mites in living areas and two bedrooms
	> Noise	> Plywood cabinets (avoidance of MDF)	> Cleanability and hygiene
	> Dust	> Prefinished bathroom linings (automotive paint technology)	> Dryness (minimal embodied moisture in materials)
	> Risk of accident (slips and falls)	> Carpet (wool, upstairs only and stairs)	
Orientation and layout	> Damp and mould	> Separation of wet areas from habitable areas	- Dryness in habitable areas
	> Stress (psychological cultural)	> Zones for activities	- Air movement
	> Stress (financial)	> Openness (no corridors)	- Surveillance of children and young adults
	> Intrusion and lack of privacy	> Flexibility/adaptability of use	- Options for sleeping arrangements (influences involving gender, relationship, generation, age, health condition and personality)
	> Infections		
	> Crowding		
	> Stress (growth environment)		

Amenity, space and size	<ul style="list-style-type: none"> > Damp and mould > Stress (cultural) > Crowding > Infections and hygiene > Crowding > Infections and hygiene > Stress (cultural) > Risk of accident 	<ul style="list-style-type: none"> > Two bathrooms, three toilets (one accessible from outside) > Separate laundry and outside drying facilities > Outside sink > Semi-habitable garage > Bed spaces for every household member, not more than two adults per room > Wide doors > Generous access spaces internally and externally > Space and facilities for special events and gatherings 	<ul style="list-style-type: none"> > Dryness in wet areas > Reasonable wait times for bathrooms and toilets > Capacity to accommodate visitors/family over the short to medium term (days to months) > Capacity to accommodate permanent household members > Capacity for use by large-bodied people, and the mildly disabled > Access for coffins and bearers > Forecourt (before front door) to welcome visitors > Capacity indoors and outdoors to accommodate a crowd of people on special occasions
Safety and security	<ul style="list-style-type: none"> > Risk of accident > Risk of attack or theft > Risk to personal safety and wellbeing in the neighbourhood > Stress (psychological, cultural) 	<ul style="list-style-type: none"> > Non-slip floor finishes > Limiters on all operable windows (opening too narrow for human body) > Fenced grounds including play area and clothes-drying area > Surveillance of entry zone 	<ul style="list-style-type: none"> > Protection against slips and falls > Protection against intruders > Control of non-approved secret outings by young household members
Household and owner (HNZC)	<ul style="list-style-type: none"> > Stress (psychological) > Stress (financial) 	<ul style="list-style-type: none"> > Long-life lamps, insulation etc > Simple, intuitively operated systems and components > Robust systems and components 	<ul style="list-style-type: none"> > Ease of management > Low operating costs > Tenure > Low maintenance costs

APPENDIX B:

Specifying the differences

Here is a list of the main physical differences between this house and the standard contemporary specification. The estimated added cost, as a percentage of the base cost, is shown in brackets:

- > **Insulation** (+4%): Floor, walls and roof are insulated 30 to 50 percent above minimum code requirements; windows in habitable spaces are double-glazed.
- > **Heating** (+2%): 6Kw heat pump; passive solar gain to living/play areas (two floors); heat-transfer duct from roof space to ground floor; wall-mounted fan heaters in bathrooms.
- > **Ventilation** (+2%): from bathrooms, fixed vents lead to a two-storey 'chimney' which extracts moisture-laden air by stack effect combined with a roof-mounted wind-driven rotary exhaust; trickle vents in window frames; fixed roof vents; large range-hood with high exhaust capability; cross-ventilation in kitchen; large upper-floor north-facing windows designed to cause overheating of the interior space from time to time.
- > **Materials** (+2%): Concrete ground floor, plywood upper floor and plywood joinery, Seratone and plaster linings, stainless steel benchtops. Robust materials; avoid off-gassing, minimise dust mites and minimise embodied moisture.
- > **Separation** (+1%): Wet areas (bathrooms, laundry and kitchen) are physically distant from habitable areas of the house.
- > **Enhanced facilities** (+3%): Three toilets; two oversized showers (one with shallow bath); 300 litre hot water cylinder; computer workstation/homework area separated from living areas; large fenced and paved outdoor play area; outside sink; large five-burner gas range.
- > **Space and size** (+6%): Increase in total floor area from 17 to 18 square metres per person (not including garage space); large doors; more generous 'confined' spaces (toilets etc); large verandas facing east and west.
- > **Airiness and connection to the outside** (+0%): Window openings are placed to maximise daylight and give multiple views across indoor spaces to the outside; habitable spaces have light from two sides and above-average window area; large sliding door between dining area and an outside terrace; light-coloured interior finishes.
- > **Adaptability and flexibility** (+0%): The design allows multiple furniture arrangements and room-uses as determined by the household. For example, bedroom and dormitory areas are designed to allow a variety of sleeping arrangements including bunks, double plus single bed (or cot) to a room, two single beds plus study area, etc; garage and living areas may accommodate marae-style sleeping arrangements on occasion; ground-floor areas can accommodate large family gatherings on special occasions.

APPENDIX C:

Temperatures in the house

Sixteen dataloggers were installed at strategic points in the house, recording temperature and humidity. Thirteen of the loggers were successfully retrieved and downloaded. The loggers collected data for at least five months, and up to 18 months.

The graphs in Figure 1 show the average temperatures observed over six weeks in the summer and autumn of 2008 over 24 hours, and the average external temperature also. Between the seasons the average external temperature decreased by 7°C, but the average living room ceiling temperature decreased by only 1.2°C (the grille temperature by 1.5°C) and the average laundry temperature (the room that was perhaps most affected by external temperature) by 3.8°C. The strong downward shift of the black (outside) line on the autumn graph is clearly visible.

In summer the downstairs bedrooms were typically cooler than the upstairs bedrooms except during early morning. In the autumn, however, although the upper bedrooms were warmer than the lower bedrooms during late morning, by evening or night the lower bedrooms were definitely warmer than the upper bedrooms. The downstairs bedrooms' average temperatures decreased by 2.2° and 2.4°C between the seasons, and the upper bedrooms by 2.8° and 3.0°C. The kitchen, which in summer was typically the warmest living space during late morning, afternoon and evening, became typically the coolest living space in autumn (except at around 5pm, when dinner was probably being prepared) – this was a decrease of 3.6°C in the average kitchen temperature. The dormitory, another ancillary living space, also had a large seasonal effect: a difference of 2.3°C. In contrast, the two measurements in the living room recorded the least average seasonal changes of any dataloggers in the dwelling (1.2° and 1.5°C); the logger located close to the ceiling of the living room tended to record a higher temperature than the logger located just above the grille. The service areas showed some of the largest changes in average temperature – 2.3°C for the upstairs bathroom (by both loggers), 3.1°C for the downstairs bathroom and 3.8°C for the laundry.

FIGURE 1: Average room temperatures in summer and autumn

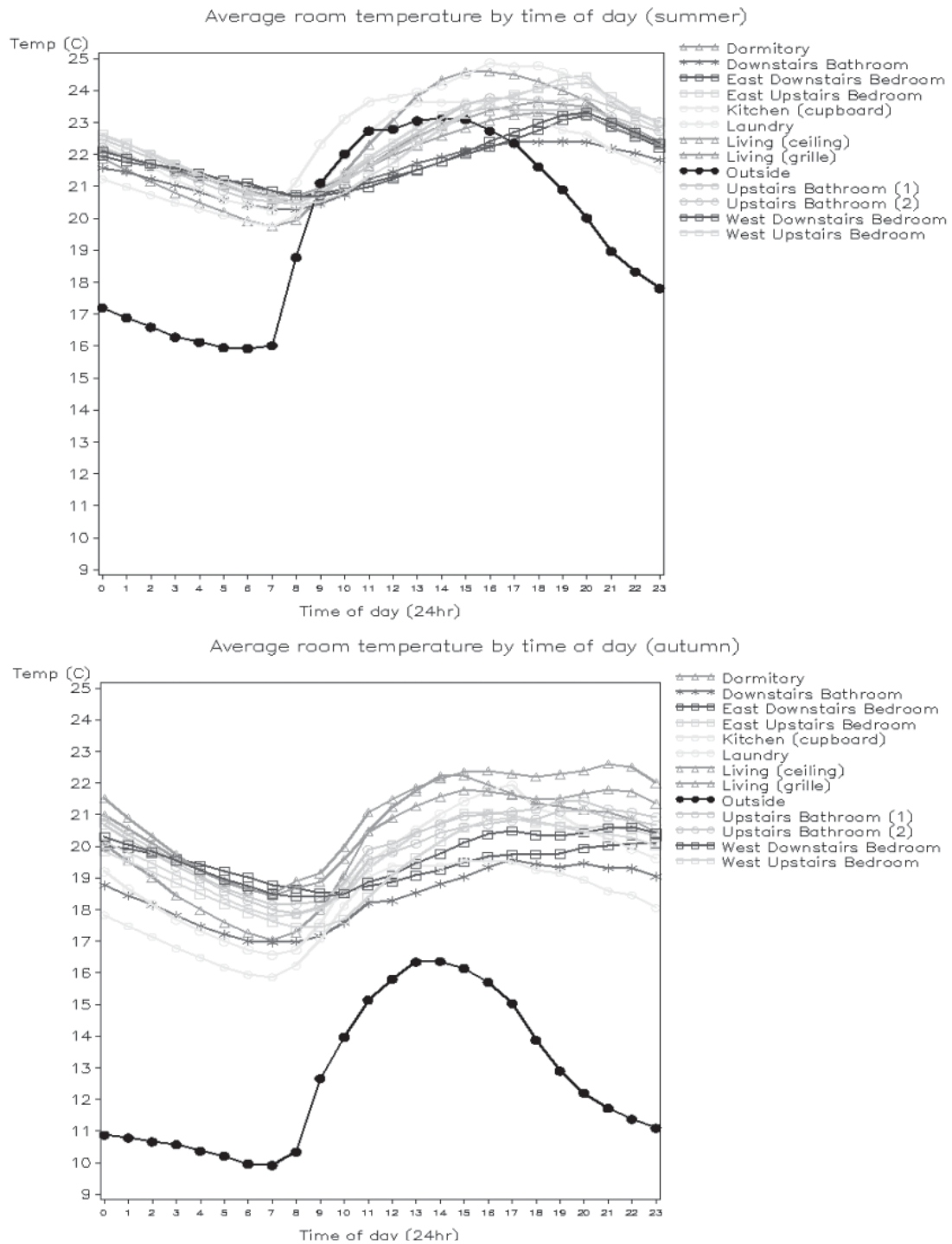
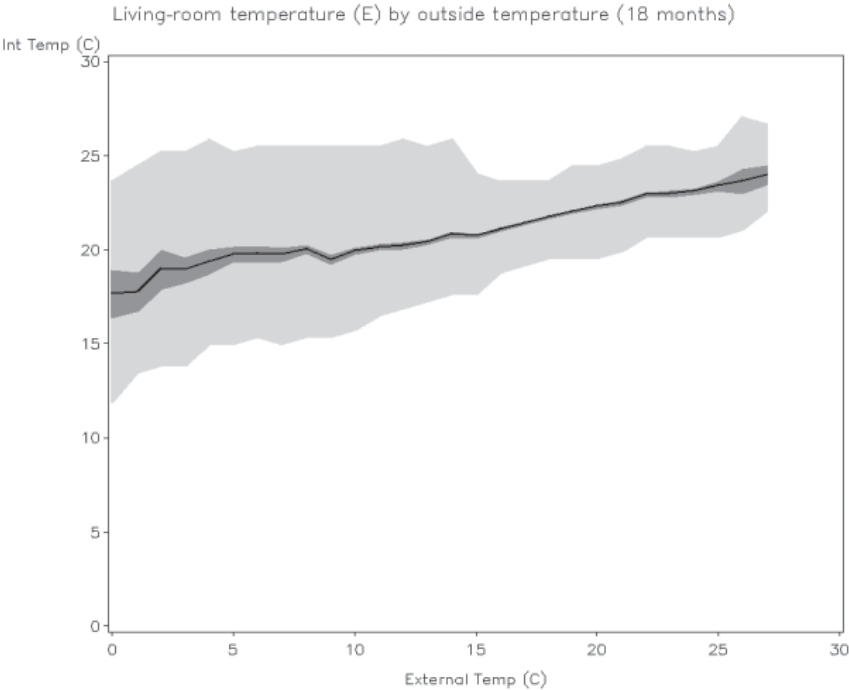


Figure 2 shows the living-room temperature (at any time of day) for a given outside temperature. The data in this graph were collected over 18 months from January 2008 to mid-July 2009. The light grey area shows the 5 percent and 95 percent quantiles for the data, within which 90 percent of the data was found, and gives an idea of the typical variation in the living-room temperature. The dark grey is the 95 percent confidence limit on the mean, and the black line is the mean living-room temperature for that external temperature. The wider confidence limits at high and low outside temperatures are because there was less data for these outside temperatures. The graph shows that warm living-room temperatures were typically maintained even when the external temperature was as low as 0°C.

FIGURE 2: Relationship between living-room and outside temperatures



Pasifika

- 1/09 *Pacific Families Now and in the Future: Changing Pacific Households*
Changing pacific household composition and wellbeing 1981–2006: Gerald Cotterell, Martin von Randow, Stephen McTaggart, Tamasailau Sua'ali'i-Sauni, Daniel Patrick, and Peter Davis, November 2009.
A qualitative snapshot of household composition, wellbeing, parenting and economic decision-making among Pacific families in Auckland, 2008: Tamasailau Sua'ali'i-Sauni, Stephen McTaggart, and Martin von Randow, November 2009.
- 2/09 *Pacific Families Now and in the Future: Pasifika Youth in South Auckland*, Dr Camille Nakhid, Tupetoa Ronji Tanielu and Efeso Collins, November 2009.
- 3/09 *Pacific Families Now and in the Future: Living the Tokelauan Way in New Zealand*, Gina Pene, Philippa Howden-Chapman, Marisa Peita, Helen Viggers, and John Gray, November 2009.

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