

Closing the gap:

10 Years of *Housing for Health* in NSW

An evaluation of a healthy housing intervention



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Acknowledgement

The outcomes achieved through the *Housing for Health* program have come from the efforts of many people too numerous to mention. These include those directly involved in the delivery of the project: project managers; Aboriginal environmental health staff; regional public health unit staff, Healthabitat, and funding partners, as well as those indirectly involved in supporting the program including travel, purchasing and accounting staff in the Department of Health and Area Health Services. Most importantly the efforts of the many community members who have participated in the projects in their communities are gratefully acknowledged.

Preface

The NSW Department of Health has been managing a health and safety focussed repair and maintenance program in Aboriginal community housing across NSW over the past 10 years.

The program has consistently identified improvements in house function for each project, increasing the ability of the householders to practice healthy living.

A detailed study using geo-coded hospital separations data was undertaken to identify if there have been any health benefits for the residents of the houses that have received the program.

The results exceeded expectations with regard to health benefits.

Acronyms

ABS	Australian Bureau of Statistics
ACDP	Aboriginal Communities Development Program
AHO	Aboriginal Housing Office
AHS	Area Health Service
AIHW	Australian Institute of Health and Welfare
DAA	Department of Aboriginal Affairs
FaHCSIA	Australian Government Department of Families, Housing, Community Services and Indigenous Affairs
FHBH	Fixing Houses for Better Health
FWAHS	Far West Area Health Service
HLP	Healthy Living Practices
NAHS	National Aboriginal Housing Strategy
NCHH	National Centre for Healthy Housing
NPAIH	National Partnership Agreement on Indigenous Health
RAMCAP	Repair and Maintenance Community Assistance Program
RCMG	Regional Co-ordination Management Group
SCRGSP	Steering Committee for the Review of Government Service Provision
SF1	Survey-Fix 1
SF2	Survey-Fix 2
SF3	Survey-Fix 3
TWT	Two Ways Together

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SECTION 1

Executive summary

Housing and infrastructure have long been identified as major environmental factors affecting the health of people. Inadequate or poorly maintained housing and the absence of functioning infrastructure can pose serious health risks. In Australia, Aboriginal people are more likely to live in overcrowded dwellings and poor quality housing, which can lead to the spread of infectious diseases (ABS and AIHW, 2008).

Over the last 10 years the NSW Department of Health (Health) in partnership with the Department of Aboriginal Affairs has been delivering *Housing for Health* projects in the Aboriginal community housing sector across NSW. The projects have been funded jointly by NSW Health, the Aboriginal Communities Development Program (ACDP) and the Two Ways Together (TWT) initiative.

Where possible, NSW Health has also worked with the NSW Aboriginal Housing Office (AHO) and Australian Government's Fixing Houses for Better Health (FHBH) program (a national program using the same methodology) to extend this work.

***Housing for Health* summary information**

71 community projects to date

2230 houses fixed

9528 people benefited from the program

Over 51,700 items fixed

The *Housing for Health* Program has undertaken repairs and maintenance of Aboriginal community housing with specific focus on improving safety and health for the residents in those homes. The program engages the community to assist in identifying required works, and prioritises all work using evidence-based criteria called healthy living practices.

Since the first trial project in Muli Muli in 1997, *Housing for Health* projects have been run in 2230 houses across 71 communities around NSW. The program has benefited

9258 people and well over 51,700 items that specifically relate to improved safety and health, have been fixed in those houses.

This has led to clearly measurable and demonstrable changes in the condition of those houses to support healthy living (Key Priority 5 of the NSW Aboriginal Health Strategic Plan).

By delivering immediate and tangible improvements to housing, the program has built a bridge of goodwill between communities and public health units across which other public health programs have been run. These "value-add" projects have included injury prevention; fire education; electrical safety education; health screening; community clean-ups; vermin reduction, water monitoring and service improvement.

Program outputs

Housing for Health demonstrated clear improvement in house function:

- 9 fold improvements in electrical safety
- 4 fold improvement in fire safety, over 2 fold improvement in structural safety and access in houses
- over 2 fold improvement in the ability to wash people and to wash clothes and bedding in homes
- 2 fold improvement in removing waste safely from homes
- over 3 ½ fold improvement in the ability to prepare, store and cook food in home.

Finally, and most importantly, a recent evaluation of the program undertaken by NSW Health has shown very positive health outcomes as a result of the program. Residents of houses where the *Housing for Health* intervention was implemented had a significantly reduced rate of hospital separation for infectious diseases – 40% lower than for the rest of the rural NSW Aboriginal population where *Housing for Health* interventions were not implemented. See figure 1 on page 6.

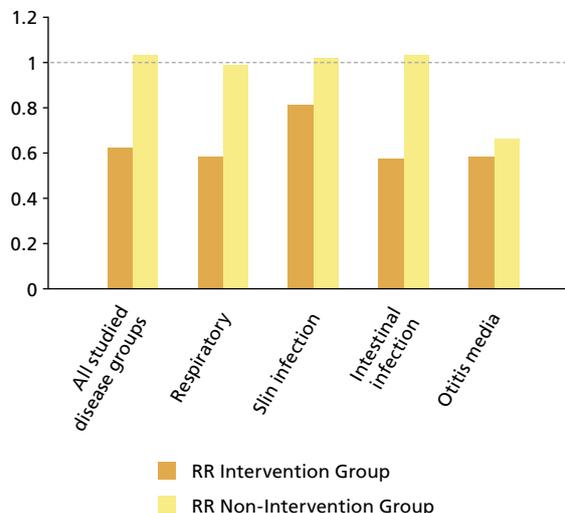
Public health evidence clearly demonstrates a link between the high burden of infectious diseases, particularly in children, and chronic diseases in later life. This program is not only contributing in the short term to reduced hospital separations for infectious diseases, but also in the long term to addressing in part, the epidemic of chronic disease in the Aboriginal population.

Health outcomes

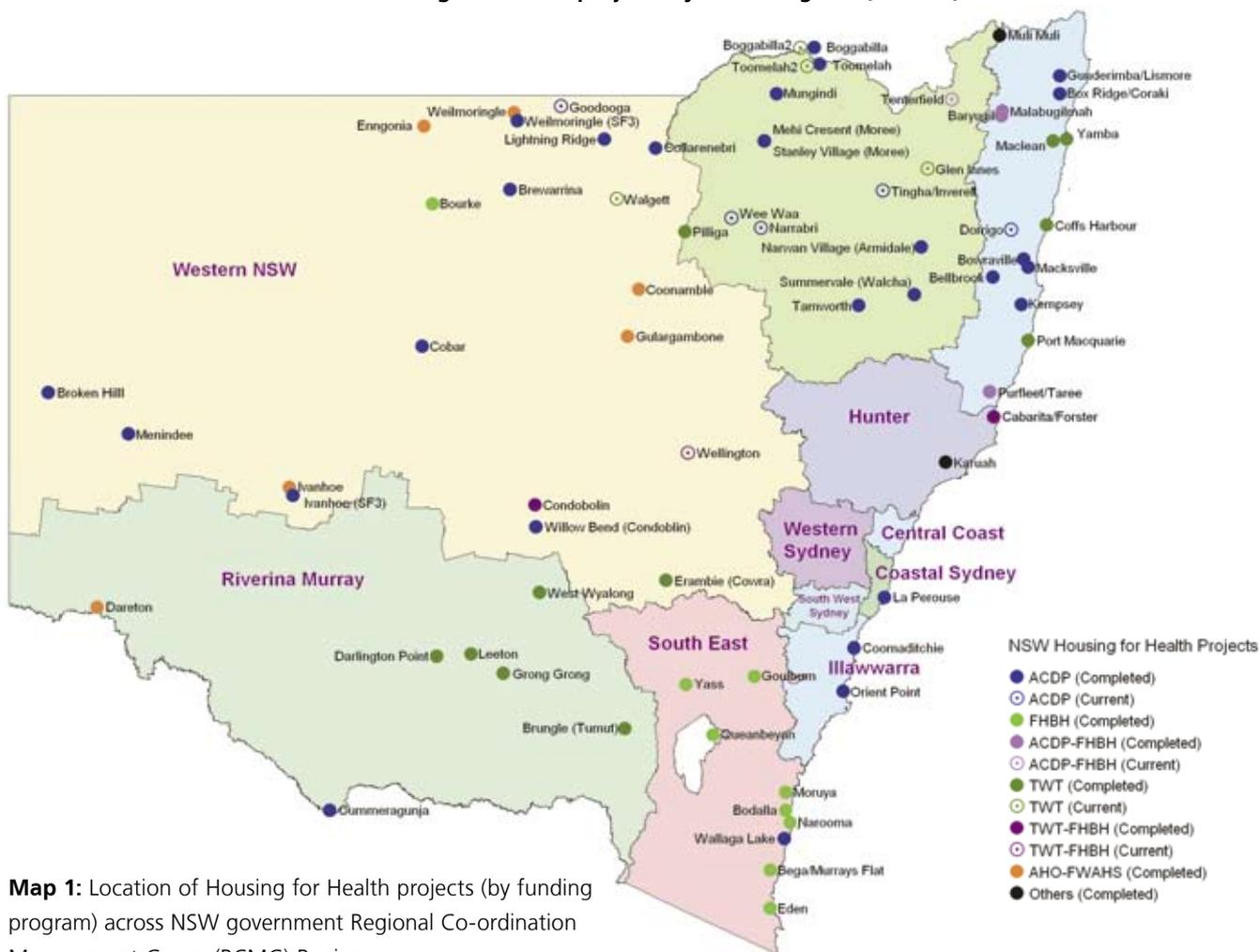
Those who received the *Housing for Health* intervention had a significantly reduced rate of hospital separations for infectious diseases – 40 % less than the hospital separation rate for the rest of the Rural NSW Aboriginal population without the *Housing for Health* interventions.

The current funding for *Housing for Health* ceases in 2009. Funds have been allocated for implementation of the program in urban areas as part of the NSW Government contribution to the National Partnership Agreement on Closing the Gap in Indigenous Health Outcomes.

Figure 1: Before and After Rate Ratios for disease conditions in populations exposed to *Housing for Health* vs Rural NSW Aboriginal control populations over the same period, (where 1 = no change in rate of disease)



NSW Housing for Health projects by RCMG regions (Nov. 08)



Map 1: Location of Housing for Health projects (by funding program) across NSW government Regional Co-ordination Management Group (RCMG) Region.

SECTION 2

What is *Housing for Health*?

Housing for Health is a survey and fix methodology for improving living conditions in community housing. The *Housing for Health* process aims to assess, repair or replace health hardware so that houses are safe and the occupants have the ability to carry out healthy living practices (HLPs).

It was initially developed in the late 1980s in the far north west of South Australia by a small group known as Healthabitat. They were working with the Aboriginal health service, and set about developing a methodology that focused on environmental changes that would lead to maximum health gains, particularly for children aged 0-5 years.

***Housing for Health* priorities**

A. Safety

B. Healthy living practices

1. Washing people
2. Washing clothes and bedding
3. Removing waste safely
4. Improving nutrition
5. Reducing overcrowding
6. Reducing the impact of animals, vermin or insects
7. Reducing dust
8. Controlling temperature
9. Reducing trauma

Research has shown that improving essential health hardware (fixing a leaking toilet, electrical repairs, ensuring sufficient hot water for the number of tenants, having somewhere to wash a baby or child, etc.) can lead to improvements in health status and reduce the risk of disease and injury (Pholeros et.al 1993). This is the primary aim of *Housing for Health*.

As the project only delivers specifically targeted repairs, and doesn't address items that don't have a direct health benefit such as fencing or painting, the process requires clear consultation with the community to clarify expectations.

The *Housing for Health* process encompasses 5 main stages:

1. Community consultation and feasibility
2. Survey-Fix 1
3. Capital Upgrade
4. Survey-Fix 2
5. Reporting and closure.

When communities agree to participate, a Survey-Fix week is set aside and a number of community workers are trained to work alongside technical staff to inspect, test, and record around 240 items in the houses, and where possible, undertake fix work. *Housing for Health* has an underlying principle of "No Survey Without Service" so survey teams carry a small tool box to undertake basic repairs to houses (unblocking drains, replace light globes etc).

Survey-Fix Process

The information recorded on each house is entered into a database and work lists are given to qualified tradespeople who follow about a ½ day behind the survey teams repairing urgent items that require specific trade skills (mostly plumbing and electrical work).

Larger non-urgent works (new hot water systems, waterproofing showers etc) are undertaken over the following months. A second Survey-Fix is then scheduled to ensure all priority works are complete; to evaluate the capacity of the house function, and to allow the community an opportunity to audit the work of the project.

More information on the *Housing for Health* process is available in Appendix A.

The Survey-Fix Process



The Survey-Fix Process

1. Community teams are trained in the survey process
2. Teams inspect, test and record results for approximately 240 items
3. Repairing a shower rose
4. Data entered and trade lists printed
5. Plumbing and electrical trades follow up that day

SECTION 3

Key components of *Housing for Health*

There are some key components of the *Housing for Health* program which have contributed to its success.

3.1 Evidence Based Priorities

All works carried out in the *Housing for Health* program are prioritised in terms of evidence-based health benefit.

Housing for Health projects have a comparatively small budget, so all works are tightly prioritised to maximise health gain and ensure houses are safe and occupants have the ability to carry out healthy living practices (HLPs).

The priorities are:

A. Safety

Immediate life threatening dangers, particularly electrical, gas, fire, sewage and structural safety issues are addressed as the highest priority.

B. Healthy living practices

After safety issues have been addressed, the prioritised list below of Healthy Living Practices from 1 (most important) to 9 provides a focus for prioritising repair and maintenance:

- 1. Washing people** – ensuring there is adequate hot and cold water and that the shower and bath work
- 2. Washing clothes and bedding** – ensuring the laundry is functional with separate taps for waste for the washing machine and tub
- 3. Removing waste safely** – ensuring drains aren't blocked and that the toilets are working
- 4. Improving nutrition** – assessing the ability to prepare and store food, making sure the stove works and improving the functionality of the kitchen

5. Reducing overcrowding – ensuring health hardware (particularly hot water systems and septic systems) can cope with the actual number of people living in a house at any time

6. Reducing the impact of animals, vermin or insects on the health of people – for example, ensuring adequate insect screening

7. Reducing dust – to reduce the risk of respiratory illness

8. Controlling temperature – looking at the use of insulation and passive design to reduce the health risks, particularly to small children, the sick and the elderly

9. Reducing trauma – being non-life threatening issues.

Note: Whilst all of the healthy living practices are important, the first four points are considered critical healthy living practices, as they are essential for people to be able to practice healthy living. Most of the works carried out as part of this program focus on safety and these top four healthy living practices.

3.2 Building Stronger and Healthier Communities

3.2.1 Community engagement

Housing for Health recognises the importance of local community knowledge and involvement in improving the housing hardware. Community members form most of the survey and fix teams that identify where the hardware is failing, and direct the work of tradespeople.

To ensure quality data is collected, the teams are trained in key health and safety issues in housing; provided a detailed survey to guide the testing of key hardware; and are supported on-site by trained technical officers.

This process is an opportunity for education and it provides community members with a broad understanding of health and safety issues within the home. This is also discussed further in section 4.

The survey and fix teams return after the capital upgrade process to survey again to ensure works have been carried out. This also provides an opportunity for the community to audit the works carried out under the program.

3.2.2 Repair response time



Housing for Health is structured to ensure urgent safety work is carried out immediately and high priority trade work is carried out within 48 hours of the first survey. This is overseen by an on-site project manager.

Larger non-urgent works are undertaken as part of a capital upgrade over the following months.

3.2.3 Survey and immediate fix



The program commits to providing “no survey without service”. The program involves not only surveying communities but includes an immediate fix component for priority repair. Teams are trained in testing items, recording results, and carrying out basic repairs. Tradespeople (plumbers and electricians) are attached to each project to provide the licensed repairs.

The immediate fix component accounts for the high participation rates by the community. Once the tradespeople start working through the houses repairing items identified by the survey teams, participation rates in the project often increase.

3.2.4 Use of local tradespeople

Wherever possible, the program encourages the use of local tradespeople to carry out the works, and is committed to utilising Aboriginal building companies or local tradespeople.

Quality assurance is a very strong component of the project, and any tradespeople that cannot deliver the service on-time and to standard, may be removed.

The use of local tradespeople provides an opportunity for the community to build a relationship with suitable local tradespeople that will last beyond the life of the *Housing for Health* project.

3.2.5 Work Opportunities



The primary objective of *Housing for Health* is to provide safe houses that support healthy living. While *Housing for Health* is not an employment or training program – it has a relatively low budget and is only in the community for a short period of time – the project managers aim to maximise work opportunities for community members wherever possible.

The community surveys at the start and finish of the program involve community members working full-time for up to a week each time. This involvement in the survey and fix process often identifies a few individuals who can assist in the main capital repair component of the program as either community liaison (ensuring tradespeople can access houses promptly) or assisting the tradespeople directly as a labourer.

Local tradespeople are encouraged to employ an assistant from the community and in a number of cases this has led to full time employment, including apprenticeships, with those tradespeople beyond the completion of the project.

3.2.6 Confidentiality

A copy of the results for each community is provided to the funding providers and also to Healthabitat as part of the licence agreement. In order to protect confidentiality, each community project is given a de-identified community number.

In addition, each house in the community is provided with a HfH number, usually displayed inside the meter box, which separately identifies each house, but bears no relationship to street address.

A master list is developed so the community, the project managers and tradespeople can carry out relevant works.

3.3 Quality Assurance

Housing for Health is a licensed methodology under copyright to Healthabitat. To comply with the conditions of the *Housing for Health* license, the *Housing for Health* Project Manager must be accredited in managing *Housing for Health* projects.

This accreditation is a key element in ensuring the methodology is adhered to, including:

- tradespeople are available and doing urgent fix work
- project work is carried out according to the evidence based priorities
- works are inspected to ensure completion in accordance with standards and specifications, and
- project data is effectively collected to monitor project changes.

To support the effective rollout of the methodology NSW Health has also delivered *Housing for Health* training to environmental health staff within public health units who provide technical support to community survey teams.

Program benefits for the health service

Factors in the natural and built environment have direct and indirect effects on human health which can be immediate or long-term. Physical and social environments are crucial to whether people live productive lives relatively free of serious illness. This is particularly the case for Aboriginal people, who experience infectious and chronic diseases and social dislocation in excess of the non-Aboriginal population. Many Aboriginal people live today in conditions of clear social and economic disadvantage. All of these things interact to contribute to poor health in many groups of Aboriginal people (NSW Health Chief Health Officer's Report 2008).

NSW Health contributes the program management costs for *Housing for Health* as there are a number of benefits to the health service that stem from this investment both directly and indirectly.

4.1 Reduced infectious disease rates

There is substantial evidence demonstrating a relationship between improved living environments and improved health of populations. Literature suggests that by targeting repairs to "health hardware" and improving the ability of a house to support healthy living practices, this will contribute to a reduction in the spread of infectious disease.

The infectious disease groups that are most likely affected by environmental conditions include respiratory infections, gastro-intestinal infections, skin infections, and eye and ear infections. Whilst some of these conditions may not be life threatening for adults, they can be for children, particularly those under 5 years old.

The *Housing for Health* program has been able to identify for each project, improvements in house function and the ability for the householders to undertake healthy living. Figure 2 on page 15 shows the average changes in house function from the start (Survey-Fix 1) and the end of the program (Survey-Fix 2).

Section 8 of this report describes the recent evaluation of the program showing substantial reductions in hospital separations for infectious disease groups.

4.2 Reduced long term chronic disease

The health system in Australia is of an internationally high standard and treatment exists for most infectious diseases. However, without addressing the underlying causes of infections such as environmental conditions (water supply, sewage disposal, housing etc) patients will be returned to the same conditions that contributed to their illness.

There is growing evidence that continual exposure to infectious diseases, particularly if combined with other factors such as poor nutrition, can contribute to chronic disease in later life (O'Connor et.al. 2006). The cost of treating the growing epidemic of chronic disease in Australia, particularly in the Aboriginal population is a concern for the future of health services delivery.

4.3 Providing the conditions for health promotion

The program ensures houses function to support healthy living. If householders do not have the facilities to undertake healthy living any education or health promotion program cannot succeed. For example, without adequate hot water and a working shower, it is difficult to encourage washing. Studies have indicated that when functioning health hardware is provided in houses, it is used enthusiastically (Pholeros et.al. 1993).

4.4 Education opportunities

An independent evaluation of the *Housing for Health* methodology by SGS Economics & Planning in 2006 noted the process augments the capacity of communities to undertake basic asset management functions.

The process of training community people to assist in surveying and fixing houses also provides an opportunity for health service staff to educate community members about the relationship between housing and healthy living.

In addition, the testing, recording and fixing of items in the homes provides an ideal opportunity to share health messages with the householder. For example while surveying the kitchen, the survey team may talk with the tenant about testing with a thermometer whether their fridge is working properly.

Whilst the repair of refrigerators is beyond the scope of this program (as they are a tenant's responsibility), the program has found that in NSW around 95% of houses have a refrigerator, but only half of those were found to be adjusted to the correct temperature to store food safely. This simple test provides an opportunity to discuss food safety and nutrition with the tenants, and for them to adjust the fridge thermostat.

4.5 Bridge building and Value-adding.

The program builds a bridge of goodwill between the health service and the community. It provides the health service an opportunity to meet with the community with a structured and funded purpose. Householders are able to see tangible improvement in their houses and the immediate fix component of the program is particularly well received by community members. Through this process a relationship is formed and it is possible to start to discuss other health related issues with the community.

It is across this bridge of goodwill that other health related services have been delivered. Public health units have worked with housing providers and Aboriginal Land Councils to seek additional funding to carry out other works. Examples of other programs that have been added to the *Housing for Health* program include:

- Well Persons Health checks (Early detection and management of chronic disease can greatly reduce impact)
- Fire safety
- Electrical safety training
- Community clean-ups
- 'Mr Germ' hygiene education in schools
- Water and Sewerage management
- Animal health programs
- Injury prevention for aged project
- Smoke free homes
- Dust control projects
- Rodent, vector and pest Control
- Drinking water monitoring.

SECTION 5

Program funding

The *Housing for Health* projects have been funded from a number of sources. The primary funding provider historically is the Department of Aboriginal Affairs (DAA) under a partnership agreement with NSW Health.

DAA allocated \$10M for *Housing for Health* under the Aboriginal Communities Development Program (ACDP) from 1998 to 2009. In addition supplementary funding of \$5.8M was provided during this time as part of the Two Ways Together (TWT) initiative.

Some additional funding has come from other sources including the Aboriginal Housing Office (which funded the Murdi Paaki Trial in 1999-2001) and the Australian Government.

The Australian Government Department of Families and Housing, Community Services and Indigenous Affairs (FaHCSIA) funds a national Fixing Houses for Better Health (FHBH) program. The FHBH program uses the same methodology as *Housing for Health* – however the funding source and amounts differ. The NSW *Housing for Health* program has, in partnership with the Aboriginal Housing Office (AHO), accessed funding from the FHBH program to do either additional community projects or to ‘top-up’ existing project budgets to undertake additional, more expensive health and safety work (such as re-waterproofing leaking bathrooms), which would normally be beyond the scope of the HfH budget.

The historical funding for the *Housing for Health* program ceases in 2009. Funding has been provided as part of the NSW Government’s contribution to the National Partnership Agreement on Indigenous Health (NPAIH) for a 4 year program focusing on housing in urban settings.

Housing for Health achievements

6.1 Project Outputs: Improved House Function

Over the last 10 years, *Housing for Health* projects have been run in 2230 houses across 71 communities around NSW. Well over 51,700 items that specifically target improved safety and health, have been fixed in those houses, benefiting 9258 people.

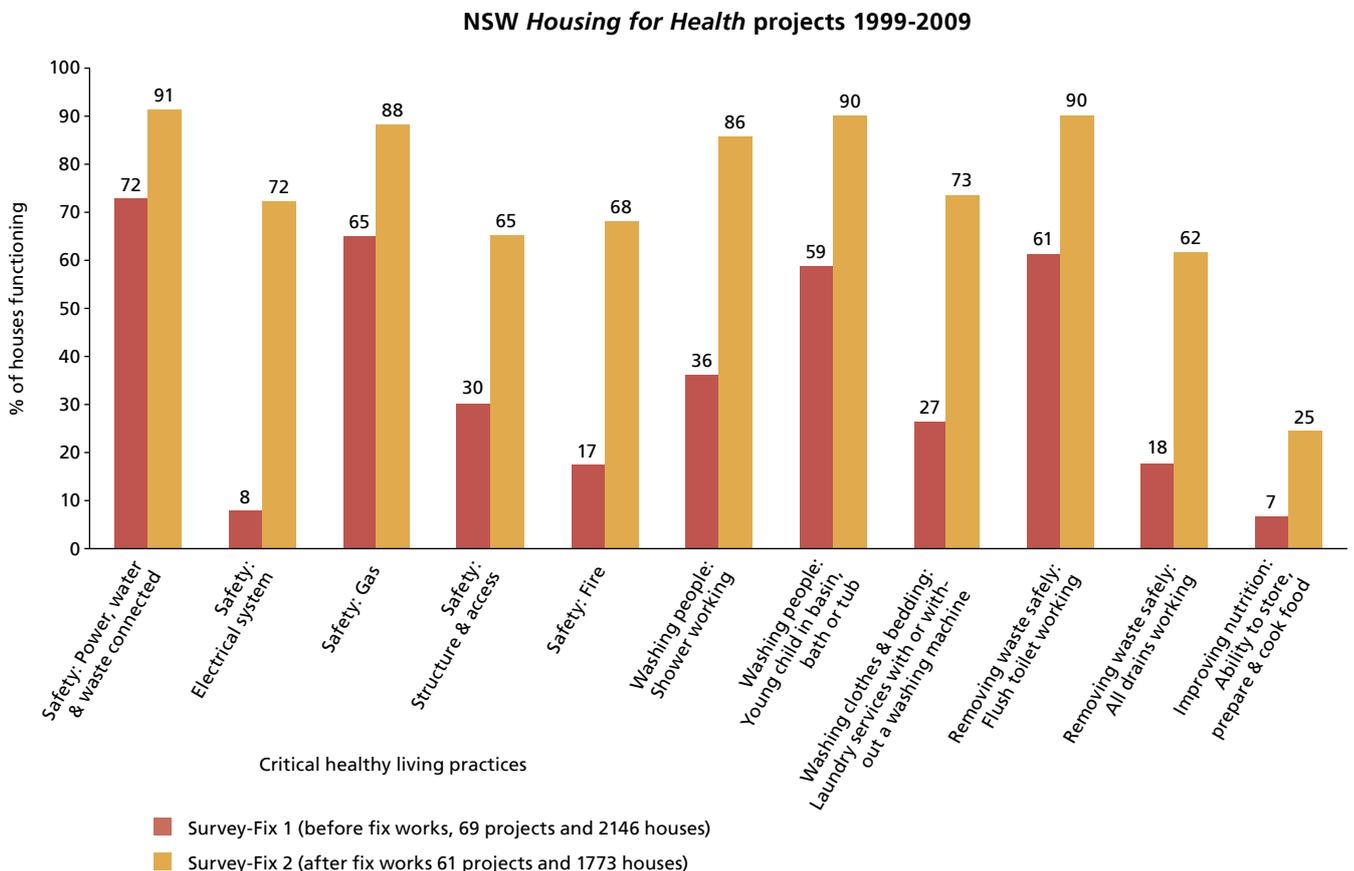
The *Housing for Health* Program has been able to demonstrate significant improvement in house function for every project. A graph showing changes in house function between Survey-Fix 1 and Survey-Fix 2 is generated for each *Housing for Health* project.

Figure 2 below shows the average results across all projects over the last 10 years. The graph indicates the level of house function at the first survey and again at the second survey for the most critical of the healthy living priorities.

Each of the critical healthy living practices across the bottom of the chart are made up of a number of items that need to be working for that house to support healthy living. For example the Washing people: Shower working requires that the following items are all in place and functioning:

1. Hot water is available
2. Cold water is available

Figure 2: Average of all NSW *Housing for Health* project results from 1999-2009



3. Hot water temperature is OK
(not too cold, or too hot to scald)
4. Hot water tap works
5. Cold water tap works
6. Shower rose works
7. Shower drains away OK.

Figure 2 shows the percentage of houses that have met *all* the criteria for each priority area.

Whilst significant improvements are made in most areas, there are some items that are beyond the scope of the program. For example the criteria *Improving nutrition: Ability to store prepare and cook food* is made up of 17 criteria, which include fridge and freezer temperature (as they are critical to storing food safely) and having adequate bench space and storage. Whilst the project will fix any plumbing in the kitchen (sinks and taps) and ensure all stoves and ovens are working, the provision of refrigeration is considered a tenant responsibility and is beyond the scope of the program. Similarly the upgrade of kitchen benches and storage is often beyond the budget for this program.

The program has been able to demonstrate overall improvements in house function, including:

- 9 fold improvements in electrical safety
- 4 fold improvement in fire safety
- Over 2 fold improvement in structural safety and access in houses
- over 2 fold improvement in ability to wash people and to wash clothes and bedding in homes
- 2 fold improvement in removing waste safely in homes
- over 3 ½ fold improvement in the ability to prepare store and cook food in the home.

Washing People: Shower repairs



1. Prolonged leaking from shower making adjoining room unliveable



2. Leaking showers are stripped, waterproofed and rebuilt.



3. Completed shower rebuild. Where appropriate, advice is sought from local Occupational Therapists to ensure modifications suit the tenants' needs.

SECTION 7

Sustainable achievements

Housing for Health is not an ongoing program. Its aims to provide a basic equitable level of safety and health in housing. The program has a defined start and finish. However, many of the gains from the program are sustained.

An assessment of the sustainability of the program's impact was undertaken in a community in Western NSW. This community was chosen as the initial *Housing for Health* program was completed 2 ½ years prior, and the community had not had a maintenance program since that time.

A third Survey-Fix was undertaken to evaluate the house function after this period.

The survey results demonstrated that whilst a few minor items required repair, most of the gains in house function from the original project were sustained, and little effort (and funding) was required to return the houses to a similar standard of house function. The specification of materials of a suitable quality (such as good quality taps) was a major contributor in sustaining these achievements.

A copy of the report is available in Appendix B.

Outcomes: health improvement

Whilst it is anticipated that improvements in house function, such as those shown in Figure 2 will lead to health gains, it is often difficult to validate those gains using readily available data sources.

Preliminary analysis of hospital data between 1998 and 2003 by NSW Health suggested associations between reduced hospital separations for some infectious diseases in the local government areas where the *Housing for Health* program had been undertaken. These health gains were consistent with the literature and expectations, but design limitations of this earlier study prevented any attribution of causes (Mayne & Standen, 2003).

8.1 Housing for Health Evaluation

A more rigorous evaluation was planned and undertaken in the later half of 2008 by which time a much larger data set was available along with access to geo-coding data.

The study examined two groups:

Intervention Group

Those people living in houses that received Housing for Health.

Non-Intervention Group

The rest of Rural NSW Aboriginal Population (not exposed to *Housing for Health*) over the same time.

8.1.1 Linkage of Housing for Health and Hospital Separations data

Houses that had received the *Housing for Health* program between 1 July 1998 to 30 June 2008 were identified from the *Housing for Health* master lists and geo-coded using Geographic Information Systems (GIS) software.

Approval was granted to geo-code addresses for hospital separations data for specific disease conditions during that same period, and for those same postcodes. The disease conditions assessed were those likely to be affected by environmental conditions (SCRGSP 2007):

- Acute Respiratory Infections
- Skin Infections
- Intestinal Infectious Diseases
- Otitis media.

The geo-coded hospital separation data was then matched to the geo-coded *Housing for Health* data. This provided the number of hospital separations for people living in the houses that had received the *Housing for Health* program.

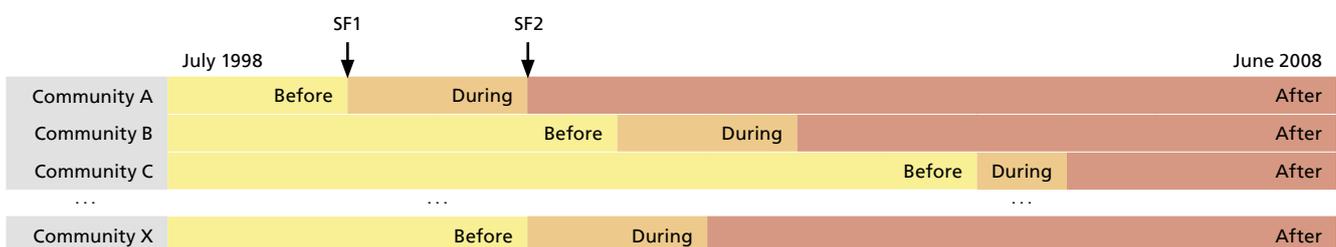
8.1.2 Definition of time periods

As seen in Figure 3, the number of days was then calculated before, during and after each *Housing for Health* project. These categories were defined as:

- **Before** – from the start of the study period (1 July 1998) to the commencement of each project, (Survey-Fix 1)
- **During** – from Survey-Fix 1 to Survey-Fix 2, and
- **After** – from the end of each project (Survey-Fix 2) to the end of the study period (30 June 2008)¹.

¹ Note: Some communities were excluded at this point as they concluded just before the end of the study period and there was insufficient post Survey-Fix 2 data available (eg in one community SF2 was finished 7 days before the end of the study period, during which there were no hospital separations.)

Figure 3: The number of days before, during and after each *Housing for Health* project varied across the study period.



8.1.3 Hospital separations – Intervention Group

The average number of hospital separations (per month) before, during and after each project was then calculated for each project location. Whilst it is acknowledged that there may be short-term fluctuations in household populations, the overall population in the houses was assumed to be relatively consistent over the 10 year study period. The results of this analysis are summarised in Table 1.

Similar analyses were carried out to provide separate rates for each of the various disease codes (i.e. Intestinal Infections, Skin Infections, Acute Respiratory Infections, and Otitis Media). This showed even greater gains for some particular disease groups. (The results of these are summarised in Figure 4 on page 21).

Table 1: Hospital separations per month (all disease groups) for the Intervention Group before, during and after Housing for Health projects.

Locality	Number of days			Number of separations			Average Number of separations per month		
	Before	During	After	Before	During	After	Before	During	After
Community A	425	245	2982	17	9	82	1.20	1.10	0.82
Community B	2295	311	1046	2	0	0	0.03	0.00	0.00
Community C	1426	350	1876	46	5	37	0.97	0.43	0.59
Community D	215	120	3317	14	4	49	1.95	1.00	0.44
...
Community Y	2892	395	365	68	11	4	0.71	0.84	0.33
Community Z	1258	426	1968	2	0	2	0.05	0.00	0.03
Total for Intervention Group							46.65	37.06	28.96

Table 2: Rate of Hospital separations per month per 10,000 population (all disease groups) for the Non-Intervention Group, before, during and after *Housing for Health* projects.

Locality	Number of days			Number of separations			Rate of separations per month per 10,000 population		
	Before	During	After	Before	During	After	Before	During	After
Community A	425	245	2982	1433	565	9366	20.57	13.78	17.40
Community B	2295	311	1046	6587	809	3968	16.70	14.31	20.23
Community C	1426	350	1876	4150	960	6254	17.23	15.55	18.05
Community D	215	120	3317	816	277	10271	23.15	13.80	17.16
...
Community Y	2892	395	365	8381	1349	1634	16.60	18.22	23.47
Community Z	1258	426	1968	3773	1155	6436	17.93	15.49	17.71
Total of rates for Non-Intervention Group							835.87	803.57	862.16

8.1.4 Hospital Separations – Non-Intervention Group

In order to demonstrate if there has been any change associated with this particular program, over and above trends that may have occurred across the rest of the state, hospital separation rates were calculated for Non-Intervention areas with Aboriginal communities selected from the rest of rural NSW.

As the Aboriginal population in rural NSW increased over the 10 year study period, the rate of hospital separations per month per 10,000 population before, during and after each project was then calculated for the Non-Intervention Group A. Total hospital separation rate was then calculated for all Non-intervention Groups combined.

The results of this analysis for the control group are summarised in Table 2 on page 19.

8.1.5 Comparison of Intervention and Non-Intervention Groups

Rate Ratios for Intervention and Non-Intervention Groups were calculated by dividing the After rate by the Before rate. This shows the ratio of change in hospital separations as a single figure. A Rate Ratio of 1.0 would indicate there was no change before and after the intervention. See Table 3 below.

This analysis demonstrated an overall Rate Ratio (after/before) of 0.62 for the Intervention Group and 1.03 for the Non-Intervention Group. This equates to:

- a reduction of 38% for people being discharged from hospital (with those infectious diseases analysed) after their house had received the *Housing for Health* intervention
- an increase of 3% for people being discharged from hospital (with those infectious diseases groups analysed) who had not received *Housing for Health*.

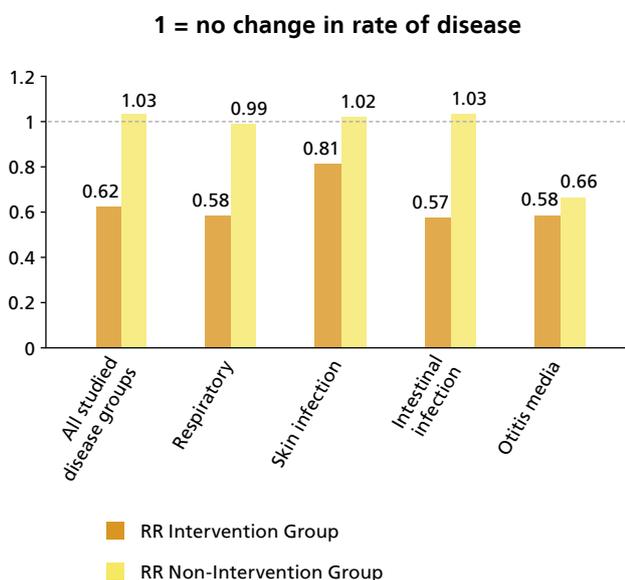
Figure 4 on page 21 graphs the rate of change for all diseases, as well as for each of the disease groups separately for Intervention and Non-Intervention groups. Those who received the *Housing for Health* intervention had a significantly reduced rate of hospital separations for infectious diseases; 40% less than the hospital separation rate for the rest of the Rural NSW Aboriginal population without *Housing for Health* interventions.

Results were statistically significant for the All Studied Disease Groups. The estimate of protection from *Housing for Health* for Respiratory infection, Skin infection, Intestinal infection and Otitis Media were approximately the same as those for the All Studied Disease Groups. However, the number of hospital separations for the individual conditions (Respiratory infection, Skin infection, Intestinal infection and Otitis Media) were much lower, and these diagnostic categories did not achieve statistical significance.

Table 3: Rate Ratios for Intervention and Non-Intervention groups

Intervention Group Hospital separations per month			Non-Intervention Group Rate of hospital separations per month per 10,000 population			Intervention Group Rate Ratio	Non- Intervention Group Rate Ratio for
Before	During	After	Before	During	After	After/before	After/before
1.2	1.1	0.82	20.57	13.78	17.40	0.68	0.85
0.03	0	0	16.70	14.31	20.23	0.00	1.21
0.97	0.43	0.59	17.23	15.55	18.05	0.61	1.05
1.95	1	0.44	23.15	13.80	17.16	0.23	0.74
...
0.71	0.84	0.33	16.60	18.22	23.47	0.46	1.41
0.05	0	0.03	17.93	15.49	17.71	0.60	0.99
46.65	37.06	28.96	835.87	803.57	862.16	0.62	1.03

Figure 4: Before and After Rate Ratios for disease conditions in Intervention and Non-Intervention Groups



For the Intervention Group, the results show a significant drop in the rate of hospital separations for all of the studied disease conditions (38%). Similar rates are shown for Respiratory conditions (42%), Intestinal infections (43%) and also Otitis Media (42%). The rate of hospital separations for skin infections decreased by a lesser, but still significant extent (19%).

For the Non-Intervention Group, the rates of hospital separations for all studied disease groups have increased by 3% in the Non-Intervention Group. These rates are fairly consistent across the three disease groups: Respiratory (1% reduction), Skin infections (2% increase) and Intestinal infections (3% increase).

The only disease group to show a substantial rate reduction in the Non-Intervention group was Otitis Media (34% reduction). This may have been influenced by the Two Ways Together Otitis Media initiative which has run from 2004-2008. However caution should be taken in interpreting these results as there were low numbers of separations for Otitis Media. A separate methodology should be considered to fully evaluate that program.

The rate ratios for the Intervention and non-Intervention groups were compared to give an indication as to how the exposed group compares to the patterns of the wider

Aboriginal population in rural NSW. The Ratio of the Intervention and non-Intervention Rate Ratios is 0.6, indication that the *Housing for Health* intervention reduced the rate of hospital separations for infectious diseases by 40%.

8.1.6 Potential sources of bias

Housing for Health is a very specifically targeted repair and maintenance program aimed at improving health. It is a limited budget program and only repairs and maintains items that will have an immediate health benefit. Aesthetic work such as painting, and other improvements such as guttering, fencing or additions are beyond the scope of this program budget.

These other works may be carried out by other Aboriginal housing funding programs. Over the last 10 years in NSW there has also been new houses built, and existing houses upgraded under the:

- Department of Aboriginal Affairs' *Aboriginal Communities Development Program (ACDP)*
- Aboriginal Housing Office's, Repair and Maintenance Community Assistance Program (RAMCAP)
- Commonwealth Government National Aboriginal Housing Strategy (NAHS) Program.

In a few cases these programs may have carried out works in the same houses that received *Housing for Health* over the 10 years. However, data was not available to the study team on exactly what works were carried out, at which locations, and exactly when. The study methodology attempted to control for any bias associated with this by defining the time periods before, during and after each *Housing for Health* project.

Should other works have been carried out in those same houses prior to *Housing for Health*, it may reduce the rate of hospital separations before the project skewing the results towards a null (or no) effect. Conversely, where other similar works may have been carried out after *Housing for Health* was completed it may add to a reduction in rates of separations after the project. Another potential bias may arise if there are changes in the total number of people inhabiting the houses that received *Housing for Health* – this will affect the denominator for the calculations of the rates of separations for the Intervention group.

The impact of other programs is not likely to have a significant impact on these results for the following reasons:

- The rate of crossover between programs is not likely to be significantly high
- Any impact on Before or After data is likely to balance out over the 10 year life of the study period
- Works were also carried out under these other programs in the Non-Intervention Group
- Works carried out under the other programs were not always targeted at the health outcomes
- It is unlikely that there will be great changes in the number of residents of houses that received *Housing for Health*.

8.1.7 Conclusion

Housing for Health has had a significant impact on improving the health of Aboriginal people in NSW.

This study demonstrates an association between the reduced rate of hospital separations for specific environmentally related infectious disease groups where populations have been exposed to *Housing for Health*.

Those who lived in properties where the *Housing for Health* intervention was implemented had a significantly reduced rate of hospital separations for infectious diseases – **40% less** than the hospital separation rate for the rest of the Rural NSW Aboriginal population living in properties where the *Housing for Health* intervention was not implemented.

These significant gains will have direct and indirect cost benefits to the health system and more broadly to society. Direct benefits include the cost of care for people admitted to hospital. These can be in the present and also in the future through the reduction of chronic disease. Indirect benefits include the cost to employees in productivity and associated leave entitlements for those affected and their carers.

The nature of this study and the magnitude of improvement demonstrated, warrants serious consideration for the future delivery of repair and maintenance in social housing.

The results of this study are highly significant, and have implications for not only the delivery of Aboriginal community housing, but potentially for the whole social housing sector.

Future directions

9.1 Different project delivery methodologies

It is often the case that whilst repair and maintenance programs for community owned housing may include some safety and health priorities, they are primarily focussed on ensuring successful tenancies and maintaining the assets. Funding is usually delivered on a financial year basis.

NSW Health's *Housing for Health* program differs in that it focuses primarily on improving the health of tenants, in particular children aged 0-5 years, by improving the health hardware within the homes. It ensures a minimum basic level of safety and health across all houses. The community is actively engaged in the process of assessing and auditing the works at the start and finish of the projects. Funding is delivered on a project basis and may cross financial years.

Whilst the two approaches focus on different priority areas within the house and are delivered differently, they are not mutually exclusive.

The NSW Health *Housing for Health* program and the Aboriginal Housing Office Repair and Maintenance Community Assistance Program (RAMCAP) both run independently. While efforts are made to co-ordinate the rollout out of *Housing for Health* and RAMCAP, there is scope for enhancing the strategic approach to service co-ordination, and for maximising the return on investment in both programs as a result of systematic collaboration.

9.2 National and international context

Commonwealth government policy has consistently recognised the need to integrate health and housing outcomes. The First Steps in Closing the Gap – Australian Government Budget 2008-09 states:

'A healthy home is a fundamental precondition of a healthy population... Children need to live in accommodation with adequate infrastructure conducive to good hygiene and study and free of overcrowding.'

This national commitment has been evident in:

- The development and continual updating of the *National Indigenous Housing Guide*, based on safety and the nine healthy living practices
- The national funding of the *Fixing Houses for Better Health* that is delivered through the NSW *Housing for Health* program.

Concerns about balancing housing and health outcomes are not unique to NSW or Australia, but have also been reflected in international literature.

Hood (2005) suggests one of the main problems in progressing a healthy housing agenda is the lack of alignment between the public health and the urban planning sectors. He states they have evolved 'into professional specialties with few too opportunities to collaborate and little mutual influence...'

In the USA, the National Center for Healthy Housing (NCHH) has emerged as a leading nonprofit organisation dedicated to establishing healthy, green, and safe homes for families through research, education, training, and policy efforts.

'With more than six million families living in substandard housing, NCHH unites leaders in the public health, housing, and environmental communities to enact the changes needed to combat inadequate housing policies and practices. NCHH provides educational programs, tools and resources to help the public create and maintain a healthy home.'

9.3 Proposed future approach

A unique opportunity exists now where both Commonwealth and State governments are financially committed to significantly improving housing conditions for people in both Aboriginal and social housing. *Housing for Health* has also been identified as a priority by the State Plan F1 Environmental Health and Community Infrastructure Working group.

As this evaluation of the *Housing for Health* program has demonstrated significant health gains it is important to explore if and how the methodology can be adopted more broadly for social housing, in particular Aboriginal housing.

In general terms this should involve exploring both the strengths and weakness of both the housing and health approaches to repairs and maintenance and developing an integrated approach.

NSW Health will be seeking opportunities to collaborate with Housing NSW and the Aboriginal Housing Office on a partnership approach to exploring new models that ensure optimal health outcomes from housing interventions. This will require skills transfer and development across agencies and the collection of appropriate data, analysis and interpretations to facilitate future funding.

SECTION 10

References

- Australian Institute of Health and Welfare. *Indigenous housing needs 2005- a multi-measure needs model*, Canberra: AIHW, 2005. Available at www.aihw.gov.au/publications/index.cfm/title/10166. (<http://www.aihw.gov.au/publications/index.cfm/title/10166>).
- Department of Families, Housing, Community Services and Indigenous Affairs, *National Indigenous Housing Guide* (3rd edition). Canberra: Commonwealth of Australia, 2007.
- Hood, 'Dwelling Disparities-How Poor Housing Leads to Poor Health' *Environmental Health Perspectives*, Vol 131, Number 5, 2005
- Mayne, D and Standen, J (2003) Evaluating the NSW *Housing for Health* Program: an ecological study
- O'Connor SM, Taylor CE, & Hughes JM. *Emerging Infectious Determinants of Chronic Diseases*, Emerging Infectious Diseases www.cdc.gov/eid, Vol. 12, No. 7, July 2006
- Pholeros P, Rainow S, Torzillo P. *Housing for Health: Towards a Health Living Environment for Aboriginal Australia*. Healthabitat: Newport Beach, 1993.
- Population Health Division. 2008. The Health of the people of New South Wales – Report of the Chief Health Officer 2008. Summary Report. Sydney: NSW Department of Health.
- Population Health Division. *The health of the people of New South Wales – Report of the Chief Health Officer*. Sydney: NSW Department of Health. Available at: www.health.nsw.gov.au/publichealth/chorep/.
- SCRGSP (Steering Committee for the Review of Government Service Provision) 2007, *Overcoming Indigenous Disadvantage: Key Indicators 2007*, Productivity Commission, Canberra.
- SGS Economics & Planning, for Department of Families Community Services and Indigenous Affairs. *Occasional Paper No 14: Evaluation of Fixing Houses for Better Health Projects 2, 3 and 4*, Commonwealth of Australia, 2006.

SECTION 11

Appendices

The *Housing for Health* process

The *Housing for Health* process consists of six main stages:

1. Community consultation
2. Feasibility study
3. First Survey-Fix (SF1) (including training)
4. Capital upgrade
5. Second survey and fix (SF2)
6. Reporting and closure.

Community Consultation

Community consultation is an important part of the *Housing for Health* process, as the program only repairs or replaces items specifically related to safety and health, and the actual survey can be quite intrusive. It is important to clarify expectations with the community so that people are as aware of what the program does not deliver, as much as what it does. For example the program will cover most plumbing and electrical issues (as they relate to health and safety), but doesn't extend to painting or other aesthetic works, fences, additions or major upgrades.

It is at this stage that the community agrees to whether it wants a *Housing for Health* project or not.

Feasibility Study

If the community agrees to a *Housing for Health* project, the project manager undertakes a feasibility study with the housing provider. It is at this stage the logistics of running the project are worked out (access to the community, availability of local tradespeople etc.) as well as the detail of the project, such as the number of houses to be included (some houses may be vacant or about to be demolished), the general condition of the houses and plumbing, and the type of sewerage disposal.

At this stage each house to be included in the project is given a *Housing for Health* number that is different to the street address to ensure confidentiality.

Survey-Fix 1

If, after stages 1 and 2, the community agrees to receive the program then a first SF1 is scheduled. This consists of a comprehensive survey of around 240 items in all houses in the community. The surveys are carried out by teams of around four people (usually three community people and a technical support person), and the first day is designated to training the teams in the testing, recording and if possible, repair of those items. There is a standardised test for each item and the information is recorded on survey sheets. Survey teams also have a toolbox with them and any minor repairs not requiring a licensed trade are done on the spot. On average it takes around 45 minutes to an hour to complete one house.



Use of good quality hardware (such as taps) ensures longer life in high usage households.

The completed surveys are then taken back to a central point in the community where the information from the surveys is then entered into a database, which takes about 5-10 minutes. Once entered into the database a list of prioritised works required for each house is printed out for each trade (plumber, electrician etc). The tradespeople usually start about half a day behind the teams. The community are involved in the selection of tradespeople and where possible, local and/or Aboriginal tradespeople are used.

The tradespeople report back to the project manager on the work people carried out, and also the reason for the problem (i.e. routine maintenance, faulty or damaged). This information is noted in the database. The database becomes the tool for managing the project.

Capital Upgrade

There are often works identified at SF1 that are too big to fix on the spot (such as rewiring a house), or require the replacement of particular items in a number of houses (such as stoves or hot water systems) and may need to be put out to tender.



An example of poor original design of laundry plumbing

These larger and more time-consuming works form the basis for a scope of works for the capital upgrade component. From this information, the design, specification and schedule of works are developed. Work included in the capital upgrade component is completed between the first and second Survey-Fix. This can take around six to nine months depending on community size.

As with the Survey-Fix stages, all works are prioritised in accordance with the *Housing for Health* Priorities.

Survey-Fix 2

A second Survey-Fix is carried out following the capital upgrade. This uses the same process as the first Survey-Fix, and addresses any works that may have either been missed at the first survey and upgrade or arisen since. The second survey also provides a comparison of house function at the first survey.

Reporting and Closure

Once any work identified at the second Survey-Fix is completed a report of the work done to each house by each tradesperson is provided to the community housing provider. In some cases it is also possible to provide a list of works that the project was unable to cover within the budget, but would recommend for inclusion in any future programs the community may run. Again these are prioritised in terms of safety and the nine healthy living practices.

Housing for Health Survey-Fix 3 Report

Executive Summary

A *Housing for Health* project was conducted in a community in Western NSW in 2000/01. This consisted of a first Survey-Fix (SF1) component, a capital upgrade, and a second Survey-Fix (SF2).

Since that time (approximately 2 ½ years) there had been no formal housing maintenance program in the community.

A third Survey-Fix (SF3) was undertaken in July 2003.

The SF3 demonstrated that the health hardware in the houses had lasted beyond expectations.

Urgent works cost only \$544 per house on average.

In addition to works fixed during the survey, a substantial electrical upgrade was undertaken including power board circuitry, smoke detectors and stove replacements. Additional carpentry work included installation of shelving in all laundry and toilet areas and repairs to doors.

The approximate costs of these additional works were \$1,156 per house for electrical and \$253 per house for carpentry respectively.

Background

During 2001, a *Housing for Health* project was undertaken in a community in western NSW. It was one of six projects funded by the NSW Aboriginal Housing Office and managed by the local Area Health Service.

The original project budget was \$210,572 across 18 houses.

The community had had no rent collection or housing maintenance since the completion of the *Housing for Health* project in 2001; a period of about 2 ½ years. A local housing provider, under an agreement with the community, took over housing management in the community in August 2003 at the conclusion of SF3, which formed part of this transition in management. This included a rent collection and repair and maintenance program.

Survey-Fix 3

In July 2003, NSW Health undertook a third Survey-Fix in the community. The purpose of this project was three fold:

To evaluate how well the health hardware (particularly plumbing and electrical) had survived without maintenance

To ensure the houses were of a minimum safe standard prior to joining the new Housing management program.

Familiarise and test the new generation (G3) of the *Housing for Health* database.

SF3 commenced in the first week of July and ran for approximately one month in which any urgent works were repaired and an upgrade of electrical and carpentry works was completed.

Budgets

The SF3 demonstrated that the health hardware in the houses had lasted beyond expectations.

Urgent works for plumbing, electrical and general carpentry cost only \$544 per house on average.

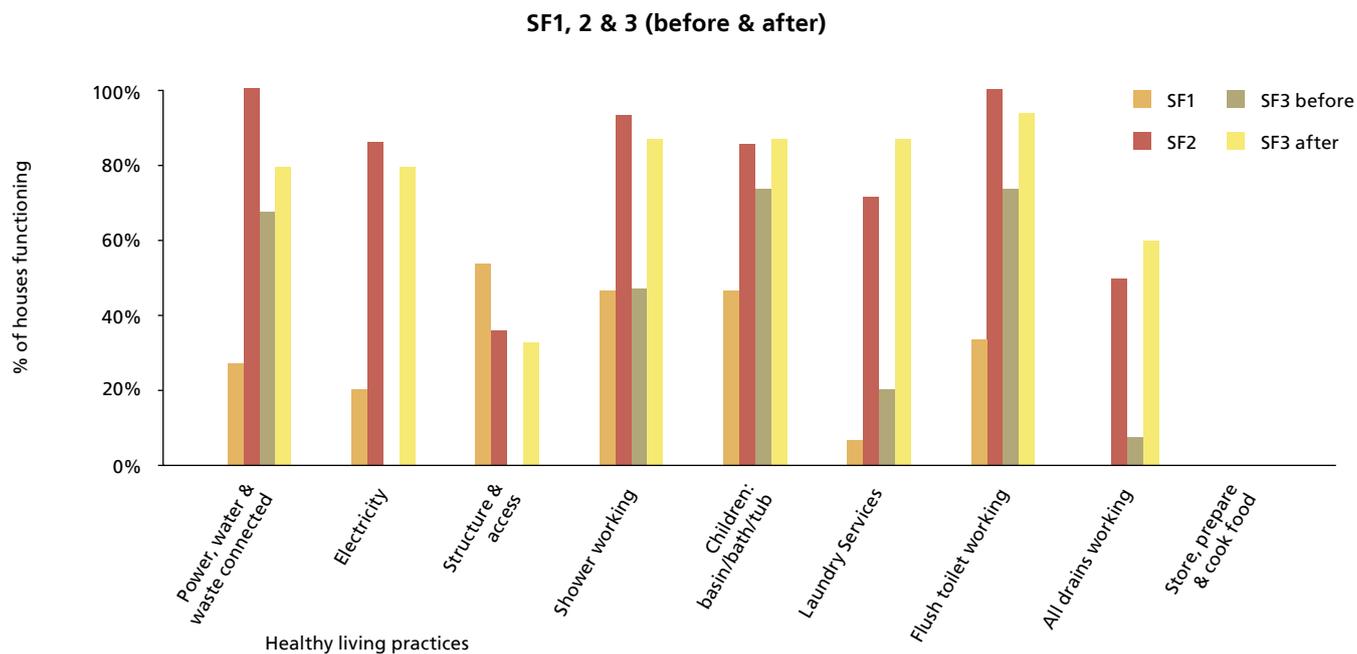
- Plumbing \$190
- Electrical \$179
- Carpentry \$176.

The upgrade component (electrical and to a lesser extent, carpentry) cost an average of \$1,409 per house and included the following components:

Electrical upgrade – \$1,156

- Circuitry: three safety switches (2 x power and 1 x lights) with earth leakage,
- Waterproof power points for all laundries

Figure 5: Results of SF1, SF2 and SF3 (before and after works)



- Smoke detector upgrade with isolation switch.

Carpentry upgrade – \$253

- Upgrade private areas to solid core doors (where necessary)
- Shelving in laundry and toilet
- Window replacement (polycarbonate) where necessary
- Repair of all entry and exit doors (solid core) and locks.

With the exception of one blocked drain, there was no major plumbing work (such as new tap ware, wastes, HWS etc) required.

In addition to the prescribed SF3 activities, major works where also undertaken to repair the sewage pump station. These costs were reimbursed through the Aboriginal Community Development Program's (ACDP) Water and Sewerage Urgent Works program and have not been included in these financial considerations.

Outcomes

The outcomes of the projects are shown in Figure 5 above. This graph shows the performance of the community housing against health and safety criteria at:

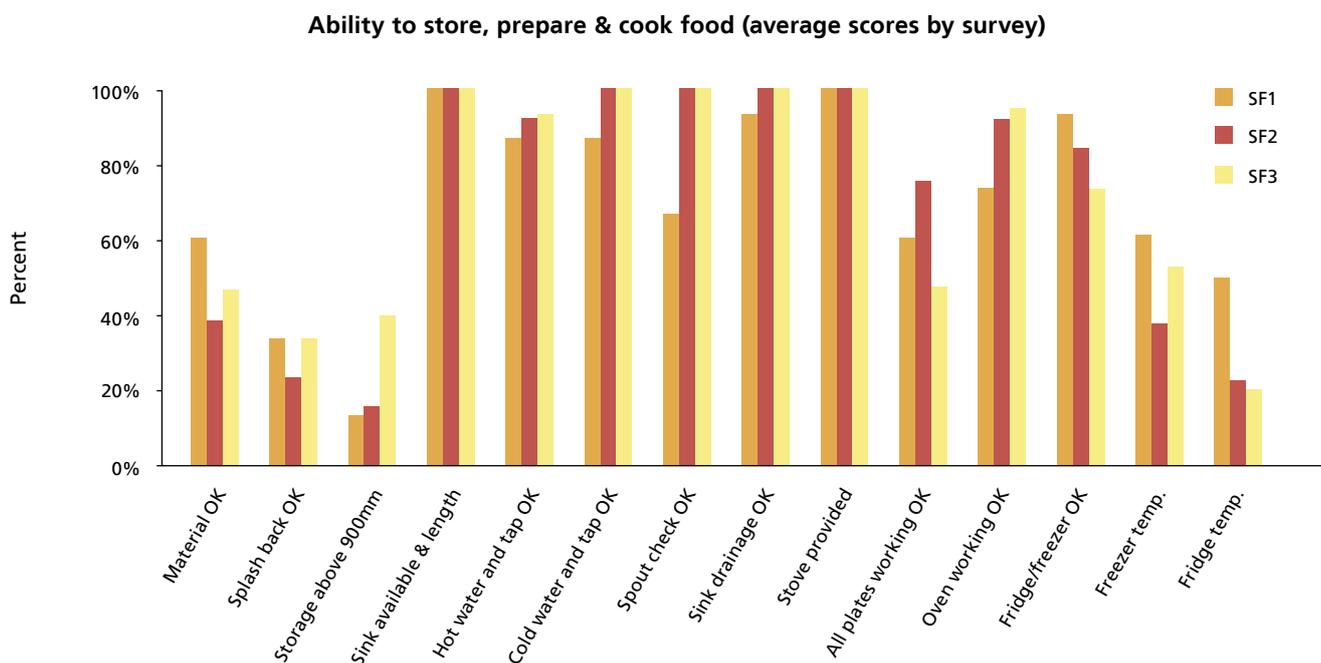
- SF1 (before the original HfH project started)
- SF2 (after the original HfH project was completed)
- SF3-before (2 1/2 years after the end of the original project with no housing management program in place)
- SF3-after (after urgent works identified at SF3 were completed).

Figure 5 shows the percentage of houses that had all items working for each critical HLP. The Critical Healthy Living Practices (HLP) listed across the bottom of this graph are derived from the data collected during the surveys, and a number of items go together to make each HLP. All items in a house must be OK for that house to meet the HLP.

There is a demonstrated improvement between SF1 and SF2. A significant amount of work was carried out during 2000 and 2001 to achieve this improvement at a cost of around \$11,000 per house. The only exception was for structure and access, where the capital upgrade works revealed structural issues not identified during SF1 (for example, termites).

SF3-before shows the condition of the houses when the 3rd survey was undertaken, before any work was carried out. Between SF2 and SF3-before (a period of around 2 1/2 years with no formal maintenance system) the condition of

Figure 6: Ability to Store Prepare and Cook Food



the houses appears to have deteriorated significantly. However, the number of items that required repair as a result of SF3 was relatively minor. This is demonstrated in the cost required to bring the houses back up to a standard equivalent to that, which existed after SF2. Only \$544 was required to address urgent works, and a total of only \$2249 on average was spent on each house (which included upgrades of fire and electrical systems). The project manager indicated that the health hardware used in the initial project, particularly plumbing, had lasted beyond expectations.

The final HLP in the graph, “Ability to Store Cook and Prepare Food”, indicates that at no stage has any of the houses in the community been able to meet all the criteria required of the *Housing for Health* methodology. This is because for each HLP there are a number of criteria that must **all** be achieved in a house for the house to receive a “pass” for that HLP, and therefore be represented on this graph.

For example the “Ability to Store Cook and Prepare Food”, requires 14 criteria to be met. These are shown in Figure 6 above.

This graph shows the 14 items that must be achieved to meet the “Ability to Store Cook and Prepare Food” HLP. The results are the percentage of houses that rated OK against each criteria at SF1, SF2 and SF3. The graph indicates those criteria where, on average, kitchens perform

poorly, and where little gain is achieved through the *Housing for Health* project.

For example, *Housing for Health* budgets generally don’t extend to repairing bench materials, splash backs or providing additional storage above 900mm. The areas where the project has made improvements include the kitchen plumbing (taps, hot water, spouts and drainage) and stove and oven repairs.

Whilst 73% of houses at SF3 had a fridge/freezer, only ½ the freezers and 1 in 5 fridges were working to keep the temperature of food down to safe storage levels. However, the provision of refrigerators and freezers is a tenant responsibility and is beyond the scope of this project.

Sustainability

Since the community joined the new housing management program, tenants in all but three houses were paying rent and participating in the ACDP program planned for the community. In January of that year, two Healthy Housing Workers were established in the community. They were based in the old CDEP shed and were working from Monday to Wednesday undertaking works based on a similar environmental health and safety audit of housing stock.

This initiative was anticipated to sustain any gains made to housing and infrastructure in the community by

Housing for Health, the ACDP, the Housing Provider or any other programs.

Conclusions

The original *Housing for Health* process cost around \$11,000 per house.

Although no maintenance was carried on the houses since the end of the HfH project two and half years prior, only around \$544 per house was required to bring the housing stock back up to similar standards that existed at the end of the original project.

Health hardware installed during the original project, particularly the plumbing items, had lasted particularly well.

For an additional \$1409/ house, electrical systems were upgraded to meet current standards and some basic carpentry was carried out.

