

Project PG01-006
**‘Integrated Approach to Improving
Health and Nutrition of Women and
Children in Central Province’**

Endline Evaluation Report

April - May 2019

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25 May 2019

Acknowledgements

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Abbreviations

ART	Anti Retroviral Treatment
DOH	Department of Health
HCW	health care worker/s
HIV	Human Immunodeficiency Virus
IMAI	Integrated Management of Adult Illnesses
MCH	maternal and child health
MDRTB	multi drug resistant Tuberculosis
NCD	National Capital District – location of Port Moresby
NDOH	National Department of Health
RAM	Rotary Against Malaria
TB	Tuberculosis
VCT	Voluntary Counselling and Testing
VHV	village health volunteer/s
WASH	water, sanitation and hygiene
WHO	World Health Organisation

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Executive Summary

The scope of ChildFund PNG's maternal and child health programs has varied over time. Over the past 10 years, ChildFund PNG has implemented a series of two- and three-year projects focussing on single interventions linked through integrated outreach: immunisation, training of village health volunteers, water and sanitation, sexual and reproductive health and TB. Based on this experience, in 2016 ChildFund PNG initiated the current comprehensive health program: **Integrated Approach to Improving Health and Nutrition of Women and Children in Central Province**. This project is designed to address the range of health issues that affect the well-being of women and children in villages: low rates of immunisation, poor nutrition, diarrheal diseases, malaria, TB, HIV, inadequacies in sexual and reproductive health information and services, and poor sanitation and inadequate access to safe, clean water. The project has been implemented over the three years June 2016 to June 2019. It is funded by the Department of Foreign Affairs and Trade and through ChildFund Australia appeals, with total expenditure to March 2019 of AUD1.333m from an initial budget of AUD1.720m.

The objectives of the project are to:

1. Improve maternal and child health in selected Wards in Rigo and Kairuku Districts through increased service delivery.
2. Strengthen the capacity of HCWs in three health facilities to provide better health services, particularly in the integrated management of maternal and childhood illnesses, TB treatment and management, HIV testing and treatment, adolescent sexual and reproductive health, and other common illnesses.
3. Reduce the incidence of water borne diseases among children through access to safe water, sanitation and good hygiene practices.

The project is being implemented in villages in three Wards in Kairuku District (to the west of NCD) and five Wards in Rigo District (two are single Ward villages) to the east of NCD. These villages were selected on the basis of their isolation, in distance or walking time, from the nearest health facility. It is in these villages that ChildFund judges that it can make the biggest differences to health and well-being and learn valuable lessons for scaling-up future projects. Indeed, an implicit further objective of the project has been to provide these lessons as a basis for better planning future projects – and this evaluation report has placed significant emphasis on supporting this objective.

ChildFund PNG's success in achieving the project's stated objectives has been heavily influenced by the constraints imposed by structural weaknesses in the health system in PNG. The lack of reliable, regular and adequate supplies of drugs and other medical provisions to health facilities, the poor overall state of the facilities and the shortage of skilled and motivated HCW, all limit what can be achieved. Whilst the project has made gains in a number of areas, little or no progress has been made in filling the gaps in others. In addition, there is very little consistency between the Kairuku Wards and Rigo Wards in outcomes - gains in one District remain gaps in the other. This is despite ChildFund PNG's long-term involvement in Rigo, particularly in Ward 6, where it has been implementing projects in the same five villages for 13 years.

Areas in which gains have been made

The extent to which gains have been achieved in health indicators, despite the structural weaknesses in the health system, can be largely attributed to the success of the project in providing additional specialised training to HCW, providing additional equipment to the health

facilities, most notably solar lights in the labour wards, organising and facilitating regular outreach, and maintaining active and engaged networks of VHV and TB supporters. The benefits of the project's activities to strengthen health resources in the communities are greatest in Kairuku, where ChildFund has been working for the shortest period of time. This may reflect greater initial gains to be made in previously under-served areas. It is also likely to reflect the strong bonds between VHV and TB supporters in this community, engendered by their loyalty to the project's manager - reinforcing how critical personal relationships are in successfully implementing projects in villages in PNG. It is these activities, that is, those aimed at achieving Objective 2, that are likely to have yielded the greatest 'value for money'.

In the absence of data on health indicators in non ChildFund PNG villages, assessments of the gains that have been made are based on comparisons with District data, where available, and more generally, on reports from HCW.

- Higher rates of immunisation coverage in ChildFund PNG versus non ChildFund PNG villages: in Kairuku 78% versus 45%; in Rigo immunisation rates are estimated to be as low as 20% in non ChildFund villages versus 57% in Ward 6 and 45% in Ward 7¹
- Mothers delivering in health facilities come disproportionately from ChildFund PNG villages: in Kairuku 26% of babies are delivered in health facilities², 41% in ChildFund PNG villages; in Rigo 31% of babies are delivered in the health facility, 59% in Ward 7 but only 30% in Ward 6³
- Fewer new cases of TB in ChildFund PNG villages as TB outreach and TB supporters encourage treatment compliance and prevent the spread of infection: as an example, in Magautou (Ward 6 Rigo), TB cases have reduced from 20+ prior to the project, to currently 1-2 cases⁴
- In the health facilities where ChildFund PNG has trained HCW on HIV testing and treatment, figures provided by HCW indicate that more VCCT and HIV testing is undertaken and patients are put immediately onto ART, reducing transmission risks and maintaining their health
- Active and engaged VHV and TB supporters: HCW comment that VHV have "...brought a lot of changes..." to health care knowledge and attitudes. This is possibly reflected in:
 - increasing proportion of women using family planning: 43% in Kairuku and close to 60% in Rigo, and many with their husband's support
 - 80-90% of the children assessed as well-nourished based on WHO weight-for-age chart

Gaps in project outcomes

Whilst there have been gains in some health indicators in ChildFund PNG villages, some gaps remain, particularly in those indicators that can have a fundamental impact on health and well-being. Again, these vary between Wards.

- In Rigo, particularly in Ward 7, immunisation coverage remains low - 45% compared with 78% in Kairuku. The only comparative rate is the measles vaccination coverage - 32% in Kairuku and 21% in Rigo⁵
- In Kairuku and Rigo Ward 6, the majority of mothers still deliver at home. Even some mothers living close to the health facility at Waima continue to choose to deliver at home. This could

¹ Immunisation rates for non ChildFund PNG villages based on data provided by HCW at Kwikila health facility

² Provincial and District Health Profile, National Department of Health, Kairuku-Hari District, Central Province, 2018

³ Data for Rigo provided by HCW at Kwikila health facility

⁴ Reported by HCW and noted in project monitoring reports

⁵ Provincial and District Health Profile, National Department of Health, Kairuku-Hari District, Central Province, 2018

reflect a number of factors such as custom, supported by confidence in a local VHV midwife who has delivered 226 babies since 1998

- Family size remains high (4 or more children) and in Rigo, an estimated 25% of girls under 20 are giving birth to their second child
- Health facilities remain understaffed and HCW over worked
- Over 80% of mothers have been turned away from a health facility due to shortage of medicines or the unavailability of HCW - and this proportion appears to have increased since 2016
- High temperature is recognised by the majority as a symptom of fever but fewer mothers are taking the child to the health facility with the possibility that fever is more frequently untreated. This has potential harmful, and in some cases long term, consequences for the child's health. This is particularly serious because fever is linked to malaria and the implication that less treatment is sought for children with malaria
- HIV hotspot appears to have developed in Waima - 15 people are on ART, 3 males and 12 females (3 aged 16-18 and 9 are mothers)
- People living with HIV report that stigma and discrimination remains high in the villages and these are contributing to a reluctance to seek testing and to high rates of loss to follow-up amongst people diagnosed as HIV+ – in turn, probably adding to new infections

Although not strictly gaps in the project's implementation, it is doubtful that two components essential to achieving sustainable improvements in health and well-being in the villages would continue without ChildFund PNG's active support:

- Regular outreach only occurs because it is organised by ChildFund PNG: without significant input from the Provincial DOH this will not continue, at least on the same scale
- VHV and TB supporters are active in their communities whilst ChildFund PNG is involved: how to facilitate volunteers' capacity to remain active without ChildFund support needs to be resolved

Some evidence of project impacts appears contradictory at first glance. In Kairuku, at the Waima health facility, since the project began more children are presenting as outpatients. At the same time, HCW at Bereina report fewer children from ChildFund PNG villages presenting as outpatients with pneumonia, whooping cough, and malaria. It may be that this reflects mothers' greater confidence in the Waima facility since ChildFund PNG has strengthened service delivery - Waima was one of the two poorest performing health facilities at the time of the baseline survey

Gaps in planned interventions

A major gap in the project's planned implementation relates to Objective 3 which is to reduce the incidence of water borne diseases among children through access to safe water, sanitation and good hygiene practices. Of the project's stated objectives, this is the one that was largely within the control of ChildFund PNG to implement. Project monitoring reports indicate that the promotion of WASH varied between years and between Kairuku and Rigo - in some years and Districts, Global Handwashing Day, World Water Day and World Toilet Day were celebrated in schools and in others in the communities. Fewer rainwater tanks and latrines than planned were installed, and restricted to schools and health facilities. Those that were installed were only completed towards the end of the project. The project team attributes this to increases in the prices of rainwater tanks and materials for latrines as well as to budget cuts. To March 2019, AUD84,000 had been spent on WASH activities, of which half was spent on community consultation and training. Given high levels of knowledge of health and hygiene related issues amongst mothers at the time of the baseline survey and the limited knowledge of these issues amongst the teachers and students interviewed as part of the endline survey, this would not appear to represent 'value for money'. Coupled with the limited investment in water tanks and latrines, both required to create a more sanitary and hygienic

living environment, progress against diarrheal diseases, and other water borne diseases, can only be minimal.

The second major gap relates to STI awareness, testing, diagnosis and treatment. HCW report very little demand for condoms, suggesting that safe sex messages are not being reinforced or possibly not even given to the cohort of adolescents who have become sexually active in the last three years. HCW also report that people with an STI tend not to seek treatment until they are “in trouble” and that their opportunities to test for STIs are limited to ANC and to people presenting for TB or HIV testing. Untreated STIs can have major adverse health consequences and increase the risk of HIV infection. There appears to be an HIV hotspot in Waima, with adolescents amongst those recently diagnosed - again indicating that young people are engaging in risky sexual behaviours.

Recommendations

It is difficult to make definitive recommendations about the further development of the current project, or of other health projects, because the major barriers to success are firmly outside the control of ChildFund PNG - or any other NGO in PNG.

In this situation, the most appropriate strategy is to design the scope and plan for the implementation of projects within the constraints imposed by the health system: to do what experience has shown is feasible and most likely to generate lasting results in health and well-being. This is not to dissuade ChildFund PNG from seeking to design projects capable of delivering on their objectives in the event that existing limitations on drugs and other supplies and services are reduced or removed, but to ensure that the planned investments in projects are sound in the event that these constraints persist.

In choosing between different interventions, addressing different health issues, consideration needs to be given to likely net project benefits, that is, to the benefits taking into account the direct and indirect costs of the structural weaknesses in the health system that are beyond the control of ChildFund PNG. Assessing project benefits on the assumption that the costs of these structural weaknesses do not exist or can be overcome will make some projects look more attractive than will be the case in practice. The result will be little ‘value for money’. Projects that can work around the structural weaknesses are likely to deliver the best ‘value for money’ – even if these projects would be given a lower priority if the health system constraints could be removed.

To assist in judging the likely benefits of different types of projects, the interventions from the current ChildFund PNG project have been classified by their potential impact and reliance on the strength of the government health sector to achieve their outcomes. This is shown in the following table: interventions marked in **green** are those that ChildFund PNG could undertake with the least direct involvement of the government health sector; **orange** marks interventions that require some input from the government health sector to be able to achieve their full potential; and **red** marks interventions whose outcomes are heavily reliant on the strength of the government health sector. By definition, this is an overly simplistic categorisation but it is designed to guide consideration of different interventions as part of integrated or focused approaches.

Specific recommendations for action arising out of the evaluation are listed for ChildFund PNG’s consideration on page 33.

Indicative categorisation of interventions by impact and potential to deliver benefits

Intervention	Potential health impact	One-off or regular	Coverage to sustain benefits	Reliance on government health sector	ChildFund capacity to undertake
Childhood immunisation	High	Regular as new babies are born	As wide as possible	Supply of vaccines, HCW and transport	Facilitate outreach
Access to HF	High	One-off		Support for HF – building, equipment, medical supplies, HCW	Supplement equipment
Family planning	High	Regular	Wide or focused	Supply of medical contraceptives	Facilitate outreach, supply non-medical contraceptives, train HCW and VHV
Delivery in HF	High	Regular	Wide or focused	Support for HF – building, equipment, medical supplies, HCW	Supplement equipment, train HCW and VHV
ANC	High	Regular	Wide or focused	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and VHV
Growth and nutrition	High	Regular	Wide or focused	HCW	Facilitate outreach, train HCW and VHV
TB testing, diagnosis, treatment and care/support	High	Regular	As wide as possible – prevent spread	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and TB supporters, emphasis on prevention
HIV support testing, diagnosis, treatment and care/support	High	Regular	As wide as possible – prevent spread	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and VHV, emphasis on prevention; reduce stigma and discrimination
STI testing, diagnosis and treatment	High	Regular	As wide as possible – prevent spread	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and VHV, emphasis on prevention, target adolescents
Malaria support	High	Regular	As wide as possible – prevent spread	Medical supplies	Facilitate outreach, train HCW and VHV, emphasis on prevention*
WASH	High	One-off	Wide or focused	Not required	With communities, materials and IEC
VHV/TB supporters	High	Regular	Wide or focused	Not required	With communities, training and IEC

Background

ChildFund began work in Papua New Guinea in 1994 and undertakes child-focused community development programs aimed at protecting the rights of children. Current programs cover four areas: maternal and child health; education through the Child-Friendly School framework; gender, rights, and resilience directed at reducing family and sexual violence; and disaster risk reduction. The geographic focus of ChildFund PNG's work is in selected Wards of Central Province as well as the National Capital District.

The scope of ChildFund PNG's maternal and child health programs has varied over time. Over the past 10 years, ChildFund PNG has implemented a series of two- and three-year projects focussing on single interventions linked through integrated outreach immunisation, training of village health volunteers, water and sanitation, sexual and reproductive health and TB. Based on this experience, in 2016 ChildFund PNG took the decision to initiate the current comprehensive health program: **Integrated Approach to Improving Health and Nutrition of Women and Children in Central Province**. This project is designed to address the range of health issues that affect the well-being of women and children in villages: low rates of immunisation, poor nutrition, diarrheal diseases, malaria, TB, HIV, inadequacies in sexual and reproductive health information and services, and poor sanitation and inadequate access to safe, clean water. The project has been implemented over the three years June 2016 to June 2019. It is funded by the Department of Foreign Affairs and Trade and through ChildFund Australia appeals with total expenditure to March 2019 of AUD1.333m from a budget of AUD1.720m.

The overall objective of the project is to achieve a sustained improvement in the health and well-being of children by supporting the delivery of primary health care for mothers and children through strengthening the capacity of health service providers in terms of the skills of HCW and the availability of resources at health care facilities and via outreach. The specific aims of the project are to:

1. Improve maternal and child health in 8 Wards in Rigo and Kairuku Districts and 2 villages through increased service delivery.
2. Strengthen the capacity of HCWs in three health facilities to provide better health services, particularly in the integrated management of maternal and childhood illnesses, TB treatment and management, HIV testing and treatment, adolescent sexual and reproductive health, and other common illnesses.
3. Reduce the incidence of water borne diseases among children through access to safe water, sanitation and good hygiene practices.

The project is being implemented in villages in three Wards in Kairuku District and in five Wards in Rigo District (two villages are single Wards). These villages were all selected on the basis of their isolation, in distance or walking time, from the nearest health facility. It is in these villages that ChildFund judges that it can make the biggest differences to health and well-being, and learn valuable lessons for scaling-up projects in the future.

ChildFund PNG has been involved in Rigo District since first coming to PNG in 1994. Its involvement in Kairuku District dates from 2015. The history of its project-based involvement in these villages since 2006 is set out in Table 1. In Rigo District, ChildFund PNG

has been working in the same five villages for 13 years, undertaking a range of health interventions. Whilst some projects involved direct interventions, most notably, immunisation for children <5, all involved awareness raising of health-related issues and the training of VHV. The evaluation presents an opportunity to determine the extent to which ChildFund PNG's presence in the same five villages for an extended period of time has resulted in differences in health outcomes amongst mothers and children in particular.



Table 1 History of ChildFund PNG project-based involvement since 2006

Years	Project coverage	Rigo District		Kairuku District	
		Ward 6 – same 5 villages	Other Wards and villages	Ward 2 – same villages	Other Wards
2006-2009	Healthy village: strengthen community leadership, MCH, health and hygiene, health patrols, DHO capacity building, VHV training, health and education infrastructure				
2011-2012	VHV training		5 inland villages		
2011-2012	Immunisation		Inland villages		
2011-2013	Immunisation				
2013-2015	WASH	Some of same 5 villages			
2013-2015	Immunisation		All 67 Wards		
2013-2015	TB treatment, TB supporters trained		5 Wards		Wards 1 &3
2015	Waima HF renovated, VHV training				
2016-2019	Integrated project – MCH, TB, Malaria, HIV, SRH, VHV and TB supporter training				Wards 1 &3

Source of project details: 2011 - 2019 Olive Oa, Health Program Manager; 2006 - 2009 2009 evaluation report from Healthy Village project

Green shading indicates ChildFund PNG projects conducted in the same 4 villages in Rigo District Ward 6 from 2006 – 2019: 13 years of continuous involvement

Orange shading indicates ChildFund PNG projects conducted in the same villages in Kairuku District Ward 2 from 2013 – 2019: 6 years of continuous involvement

The number of people covered by the current ChildFund PNG project, and the project's coverage in the two Districts of Central Province are shown in Table 2. As proportions of the District and Provincial populations the project's coverage is low - 9% in Rigo, 4% in Kairuku, and 4% across the Province. The table also highlights the limited availability of health facilities in these areas, in relation to the populations served. This reinforces the value of the assistance provided by ChildFund PNG in strengthening these facilities.

Table 2 District and provincial population coverage by ChildFund PNG integrated project

ChildFund PNG Wards	Males	Females	Persons	Health Facility	District population
Rigo				Kwikila	67,500
Ward 5	689	676	1,365		
Ward 6	666	644	1,310		
Ward 7	1,349	1,216	2,565		
Daroakomana	108	94	202		
Goulupu	396	387	783		
	3,208	3,017	6,225		
% of Rigo population			9%		
Kairuku				Bereina	145,000
Ward 1	1,199	1,138	2,337		
Ward 2	740	650	1,390	Waima	5,480
Ward 3	895	858	1,753		
	2,834	2,646	5,480		
% population of Kairuku			4%		
Total	6,042	5,663	11,705		
% of population of Central Province			4%		

Sources: ChildFund PNG Mapping and Provincial and District Health Profile, National Department of Health

Evaluation Objectives

As set out in the TOR, the evaluation objectives were:

1. Assess the achievements of the health interventions in the project targeted wards and communities in Kairuku and Rigo Districts of Central Province, particularly in relation to improving the health outcomes of women and children.
2. Analyse reasons for success, and constraints to achieve them, including assessment of technical aspects, the methodologies/approaches used in all steps of the project cycle, and strategies for mobilising different stakeholders in the implementing process to achieve project outputs and desired outcome. It will also assess community and other stakeholder participation, inclusion of marginalized/most vulnerable groups, and ownership of the implementation process.

3. Draw lessons and practical experiences achieved through the impact of ChildFund’s health interventions.
4. Assess the outcomes against ChildFund’s Health Sector Model and MEL Framework.

Evaluation Methodology

The evaluation methodology involved collecting data and information through a mix of face-to-face structured interviews with project participants and guided discussions with other stakeholders, including ChildFund PNG staff, as well as from examination of project documentation. The project documentation included the 2016 baseline study and report. The evaluation report from the last integrated health project implemented by ChildFund PNG (2006-2009) also provided valuable background to the current evaluation as this project was implemented in five of the same villages in Rigo District as the current project. The data and information were assembled and analysed using qualitative and quantitative methods.

Numbers participating in the endline surveys are shown in Table 3.

Table 3 Numbers participating in endline surveys

	Kairuku		Rigo		Total	Health facility
	Ward 1	Ward 2	Ward 6	Ward 7		
Surveys						
Mothers of child 0-5	29	30	28	36	123	
VHV	4	4	6	4	18	
TB supporters	6	6	3	3	18	
Teachers	3		7		10	
Students	65		55		120	
HCW					9	Bereina, Waima, Kwikila

The surveys of HCW and Mothers of children 0- 5 followed closely the questionnaires used in baseline studies. This was done in order to provide a solid basis for assessing changes in project key indicators. The questionnaires were long and detailed but respondents remained engaged and willing participants. The surveys of VHV and TB supporters were designed to yield information on their activities and what keeps them engaged. The surveys of teachers and students were designed to determine their knowledge and practices in relation to health and hygiene.

The discussions with HCWs at the Waima, Bereina and Kwikila health facilities were designed to explore the extent to which ChildFund PNG projects are creating a legacy of improved health infrastructure and health delivery services in Rigo and Kairuku Districts - a legacy that successive rounds of projects will be able to build upon. Testing this proposition was of particular interest in Ward 6, Rigo District where ChildFund PNG has been implementing health projects in five of the same villages for 13 years.

A meeting with another NGO, Rotary Against Malaria, was designed to explore the extent to which the activities of ChildFund PNG in Kairuku and Rigo are beneficial to other NGOs working in Central Province. In implementing their projects, are NGOs like RAM, able to tap into the skills acquired by HCW through training provided by ChildFund PNG, through improvements at health care facilities and through the network of trained and active VHV? RAM is working in some of the same Wards as ChildFund PNG in Central Province, as well as in other Wards, providing a basis for comparing their assessment of differences between Wards in the ease with which their programs could gain traction. Was it easier and quicker in ChildFund PNG Wards in comparison with other Wards? Which ChildFund legacy resources were of greatest benefit?

Evaluation Limitations

Whilst a number of aspects of the evaluation influence the strength of the findings in relation to some of the project's interventions, none of the limitations negate the overall findings of the evaluation.

The most limiting aspect of the evaluation is the lack of hard data - and timely data - on health indicators in non ChildFund villages in Central Province. Data on health indicators in Central Province is available from the National Department of Health but the most recent published comprehensive set of data relates to 2016, with an abridged set updated to 2018. As a result, comparisons of the health and well-being between people in ChildFund villages and non ChildFund villages are based on largely qualitative information provided by HCW.

In terms of tracking changes in health indicators over the life of the project, the comprehensive 2016 baseline study has been invaluable. However, not all data collected in relation to health facilities was included in the baseline report. For example, there is no information on the capacity of HCW to deliver health services, including information on training they had received, on their treatment of HIV and TB patients, and support of VHV, as well as knowledge in relation to water borne diseases. Whilst this limited direct 'before and after' comparisons on these indicators, discussions with HCW could elicit their views on the extent of change resulting from the ChildFund PNG project over the three years.

The nature of the project and the interactions between interventions, most undertaken within the constraints of the health system, make a meaningful analysis of 'value for money' difficult – and likely to yield uncertain results. Even without these conceptual difficulties, the project's accounts and monitoring reports do not lend themselves to a basic assessment of the unit costs of individual activities.

Potential sources of bias in conducting the endline surveys

1. Data on the immunisation of children 0-5 was not collected from mothers in Ward 1 (Kivori) in Kairuku because children's clinic record books were not available at the time the interviews were conducted. As a result, 29 full immunisation records were missed. However, 29 full immunisation records were collected from children's clinic books in Ward 2 (Waima Abiara). As both Wards are covered by the same health facility at Waima, and VHV are active in encouraging mothers to take their children to the clinic for immunisation in both Wards, it seems not an unreasonable assumption that the immunisation rate in the two Wards would be similar.

Comparing baseline and endline survey results also increases confidence in this assumption. In the baseline survey, 80% of mothers in Kivori reported that all their children were fully immunised. In response to the same question in the endline survey,

86% of mothers said that all of their children were fully immunised and the results based on the children's clinic books indicate that 78% had been fully immunised.

2. The selection of mothers of children 0-5 in the villagers introduces a source of non-sample bias. VHV from each Ward were asked to arrange for 30 mothers to be available for interview, with a specified number per village. Inevitably, the mothers who are interviewed are those who could be located by the VHV and who were willing to participate in the survey. This may tend to favour mothers who are more aware of issues affecting the health of their children and are more likely to attend outreach sessions. The selection of villages with a range of characteristics - for example, some more isolated than others, some with stronger cash economies than others, some with a school and some without - was designed to offset, to some degree, this potential source of bias in survey responses. However, it is acknowledged that this may not fully redress any systematic bias towards the participation of more engaged mothers in the survey.
3. The selection of VHV for interview introduces the same potential source of non-sample bias. Of more concern was the inability to interview VHV who are non-longer active in order to explore the reasons why and what measures could have encouraged them to remain active, given the high cost of their training and the costs incurred in recruiting and training replacement VHV. Some inactive VHV have left their village and hence are difficult to locate. However, others may have found the opportunity cost of volunteering their services to their communities too high and returned to the activities that feed and clothe their families.

Despite being unable to interview inactive VHV, the endline survey did collect information from the active VHV on what, if anything, could be done to provide greater support to them in their work. HCW were also asked what they thought could be done to provide greater support to the VHV to help them remain active in their communities.

4. Language difficulties in the more remote villages could have been a problem in interviewing mothers. However, the survey team included language speakers from both Kairuku and Rigo Districts who were able to translate on the few occasions this was required. All other interviews with mothers and VHV were conducted in Tok Pisin. Only some teachers and students were interviewed in English where the evaluator was confident that the interviewee was sufficiently fluent in English.

Evaluation Findings

Discussion of the evaluation findings begins with an examination of the extent to which the capacity of HCW has been strengthened through the project. Evidence of the effectiveness of this - and of the strengthening of the health facilities - will be measured by the impact on maternal and child health and family well-being over the past three years. Whilst the ChildFund MEL was used as a guide in preparing to review the endline survey findings, it proved difficult to follow in practice because there is very little overlap between the performance indicators and outputs listed in the project logframe and those listed in the MEL.

Improvements in health care services and facilities

Increase in training opportunities for HCW

In the three health facilities covered by the project, ChildFund PNG successfully trained HCW in MDR TB patient diagnosis, treatment and care. HCW also received training in IMAI (Integrated Management of Adolescent and Adult Illness) in relation to HIV testing and treatment. As an indication of recognition of ChildFund PNG's capacity to organise the training of HCW, the health team was requested by the Provincial Department of Health to facilitate training on HIV testing and treatment to HCW in all health facilities across the province. The training was undertaken by WHO trained trainers.

Whilst the training is highly regarded by participants, HCW voiced their concern that training sessions were not always immediately backed up with the required resources. The most frequently missing resources were medicines and medical supplies, the responsibility of the National Drug Store. Other resources sometimes missing post training include revised IEC materials and the means to follow up on patients such as a lack of transport for either HCW or patients. Provision of these items is within the control of ChildFund PNG. Without adequate back up, the value of the training is diminished. Whilst HCW have additional knowledge and skills, they are unable to fully utilise them to the benefit of their patients.

For example, of the three health facilities included in the endline survey, Waima is unable to offer patients testing and treatment for MDR TB. When cases are suspected, the patient is referred to Port Moresby General Hospital, a three-hour, K50 return PMV ride away. Continuing treatment can be provided at Waima - provided the drugs are available from the National Drug Store.

Improvement in health facility equipment

Of the equipment provided by ChildFund PNG as part of this project, it is the installation of solar lighting in the labour wards that has proved to be of greatest value to MCH staff. Good lighting, and reliable lighting, makes delivery safer and easier for the midwives - no need for someone to be available to hold up a lantern - and more reassuring for the mothers. In Waima, before 2015, when a ChildFund project renovated the health facility, including provision of a labour ward, no babies were delivered at the facility. In the first year after the labour ward had been built, 41 babies were delivered at the facility and in 2018, with the installation of solar lighting, the number of mothers delivering in the facility increased to 60.

Based on an updating of the equipment listed in the baseline survey, the three clinics included in the endline survey have most of this equipment available and functional (Refer Appendix 1). Unavailable and non-functional equipment is listed in Table 4. In Waima and Bereina health facilities the blood pressure machines are not working. Even though this is equipment provided through the provincial DOH, ChildFund PNG has the capacity to ensure that the Department acts when equipment is reported as non-functional.

The table also lists the equipment desired by HCW. The Bereina health facility, which serves the Kairuku District with a population of approximately 145,000, nominated a foetal dopler

which would allow more accurate monitoring of an unborn baby’s heartbeat and test strips for a glucometer. Given the prevalence of diabetes amongst villagers, the facility acquired a glucometer but the supply of strips has run out, and, as strips are expensive, the HCW are now unable to measure blood sugar levels amongst villagers. In Kwikila, serving the Rigo District, with a population of 67,000, the needs are basic – and easy to remedy.

Table 4 Outstanding equipment requirements in health facilities

	Waima	Bereina	Kwikila
Unavailable	protective clothing, particularly for labour ward; weight/height chart	protective clothing; weight/height chart, MUAC strips	protective clothing, infant scale beam, weight/height chart
Non-functional	blood pressure machine		blood pressure machine
Desired		foetal dopler; glucometer test strips	thermometer, medical kit carry bag

Improvement in health facility capacity to provide interventions

In the baseline study, HCW were asked about the capacity of their facility to provide MCH. The health facilities at Waima and Agevairu were found to be in urgent need of strengthening. The Waima health facility was unable to provide safe childbirth, diarrhea management, medical contraceptives, malaria treatment and PMTCT. The Agevairu health facility was unable to provide diarrhea management, medical contraceptives, malaria treatment and PMTCT.

Over the intervening three years, with assistance from ChildFund PNG, the health facility at Waima has been substantially strengthened. The two HCW at the facility can now provide safe childbirth, diarrhea management, malaria treatment and PMTCT. However, they do not always have the kits for HIV anti-body testing of pregnant women and women are asked to return for testing. For women from Kivori, this is likely to involve a two hour walk along a hot dusty track as there are few vehicles and even fewer PMV services in the villages along the coastal strip. Despite the lack of anti-body testing kits, the provincial Department of Health reports that the Waima health facility has met the national standard for HIV testing.

With only two HCW looking after a population of over 5,500 people (2,600 females), the MCH Sister noted that she does not always have time to give advice on child spacing and maternal nutrition. As discussed on page 11, many women are continuing to give birth with less than two years spacing between babies.

Remaining gaps in capacity to provide health care interventions

Despite the progress of the last three years, significant gaps remain – but not all are within the capacity of ChildFund PNG to address.

For all three health facilities serving the ChildFund PNG Wards - and probably for all non-private health facilities in PNG - the most significant gap is the lack of a regular and sufficient supply of medicines and diagnostic test kits. This applies to all medicines: antibiotics, ART for adults and infants, drugs to treat MDR TB, other TB drugs, malaria treatment, vaccines to immunise children, and medical contraceptives. Whilst this is not something that Childfund

PNG - nor any other NGO - can address directly, the inability of the National Drug Store to provide enough medicines in a timely manner is severely limiting the impact of all health projects. Under the control of the national government, the National Drug Store is the only organisation in PNG permitted to import and distribute pharmaceuticals and other proscribed medical supplies to public and church health facilities.

Another area where constraints within the Government system are significantly limiting the value of health facilities is the lack of financial support from the Provincial Health Department, in turn, dependent on the National Department of Health, to adequately staff facilities and to fund regular outreach activities.

All of the health facilities in the Wards in which ChildFund PNG is working are understaffed. Bereina has a staff of 18 to cover a population of 145,000. The 18 staff includes two trained to care for TB patients and two to care for patients with HIV. Kwikila has a staff of 18 to cover 67,000 people; and Waima two to cover 5,500 people. The HCW at Waima see, on average, 30+ patients per day. For cases they cannot deal with, Bereina is over an hour away, if transport is available and the roads passable. The Waima facility is officially closed at night and at weekends, but the MCH HCW essentially has no time off - if a mother presents in labour at the health facility then she is the only trained midwife on hand to assist. As discussed in the following section, the shortage of staff - and a population growing at 3.5% pa - is resulting in more people being turned away from health facilities because an HCW is not available or there are no medical supplies.

Regular outreach activities are essential given the isolated locations of many villages and the difficulties, in time and money, particularly for mothers and children, to travel to the health facilities. With the exception of the polio campaign, facilitated by WHO, the only outreach undertaken from the three health facilities in ChildFund Wards is that facilitated by ChildFund PNG. The facilities run regular static MCH clinics, but these can only be attended by mothers who can find transport or who are motivated to walk the long distances from their villages.

Another serious gap in the ability of HCW to provide an adequate range of health services is their inability to follow up on HIV+ patients. This is a particular problem in the two health facilities that service a wide catchment - Bereina and Kwikila. In Kwikila, 24 HIV+ patients have been lost to follow-up out of a total of 45 people identified as HIV+, two of whom are now deceased. In Bereina, 5-6 HIV+ pregnant women have been lost to follow-up and two HIV+ children. People lost to follow-up are thought to be continuing to live in their communities and the adults probably sexually active. The two main reasons given for the loss to follow-up are interrelated. One is the continuing high level of stigma and discrimination against HIV+ people in the villages that makes people reluctant to engage with the HCW in a way that could draw attention to themselves. The other is that the HCW lack the means to maintain discrete contact – no vehicles without health facility identification, no funds from which to provide HIV+ people with transport money or a phone or phone credits.

Gaps also remain in relation to IEC material – leaflets and posters. As discussed in a later section (Project Finances), IEC material and medical equipment together account for less than 3% of total project funds (AUD43,000). HCW report insufficient supplies of material, particularly for mothers, and a lack of new material to attract the interest of mothers as well as VHV. In addition, many of the leaflets use lots of words to deliver their messages, often in English, with a few in Tok Pisin and even none in local languages. This is likely to limit their usefulness as 'how to' guides for mothers preparing for childbirth or whose children have diarrhea or fever, or as reminders of the need for immunisation.

Using VHV to increase access to basic health care

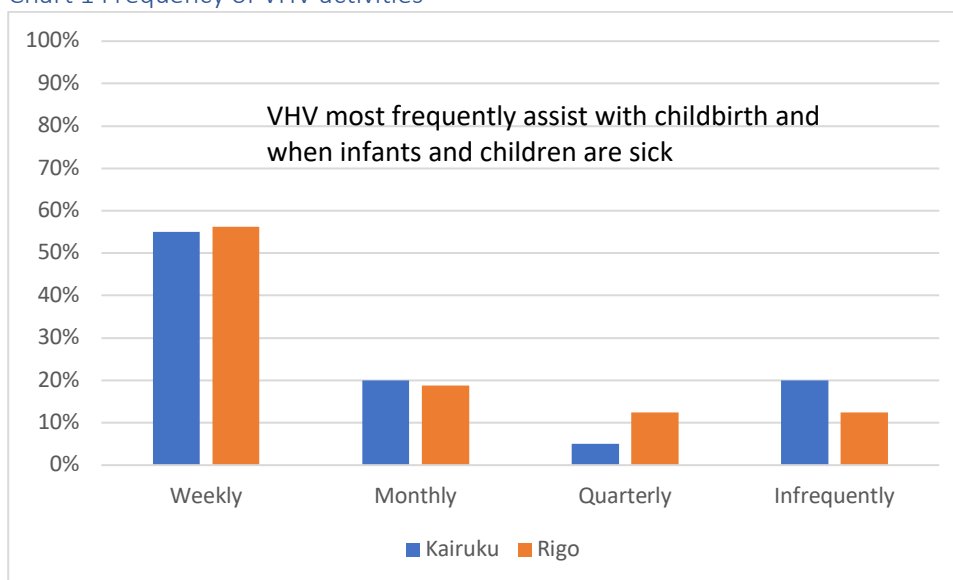
HCW comment that through awareness raising VHV have “...brought a lot of changes...” to health care knowledge and attitudes in ChildFund PNG villages. The lower incidence and prevalence of TB in ChildFund PNG villages is attributed by HCW to the project and to the TB supporters working closely with TB patients in their communities.

In Kairuku, many of the VHV were recruited and trained in 2015 as part of a project to renovate the Waima health facility and increase access to basic health care using VHV (refer Table 1). Many of the TB supporters were recruited and trained as part of the 2013 - 2016 TB treatment project. A strong bond has developed between these health care volunteers and the project, based, in part, on their loyalty to the project’s manager who comes from these villages and whose family still live there.

In Rigo, some VHV have been involved with ChildFund PNG projects for more than 10 years, receiving refresher training from time to time. Others were recruited and trained as part of the current project. Whilst those who remain active are, for the most part, highly motivated, they do not appear to have bonded as a group to the same extent as the VHV in Kairuku. This could, in part, reflect the fact that their villages are scattered across mountainous terrain and travelling between villages is more difficult than in Kairuku. The Rigo VHV and TB supporters are likely to only meet as a group at trainings and during exposure visits organised by ChildFund PNG.

In their villages, VHV most frequently assist with childbirth and when infants and children are sick. The frequency with which VHV undertake their roles is shown in Chart 1.

Chart 1 Frequency of VHV activities



Changes in health indicators in ChildFund PNG villages

This section discusses changes in health indicators in the ChildFund PNG villages and seeks to determine the extent to which these changes can be attributed to ChildFund PNG projects. The health indicators examined are: access to health facilities; health facility delivery and ANC, knowledge and practice of family planning, immunisation rates 0-5s, malnourishment 0-5s,

prevalence of diarrhea 0-5s and management of diarrhea by mothers, fever diagnosis and management.

Access to health facilities – Charts 2 & 3

Population growth rate in Central Province was one of the highest in PNG - 3.5%pa between 2000 and 2011 compared with 2.7% for PNG, and currently estimated to be 2.5%pa. Whilst the population is growing, the availability of health services is not and indeed declining with the closure of some aid posts. In the Central Province there is one health facility per 6,344 persons and one nurse (HCW) per 3,833 people.

Over the past three years, access to health facilities appears to have decreased with aid posts closed in Ward 1 in Kairuku and Wards 6 and 7 in Rigo. For most villagers now, the nearest health facility is at least an hours walk away. The difficulties caused by this are exacerbated by the high proportion of people being turned away from a health facility as a result of a lack of medicines or the availability of HCW - from 69% in 2006 to up to 93% in Ward 6 in Rigo in 2019. For up to one third (again, in Ward 6, Rigo), the consequence is that no action is then taken to deal with the issue that had them seeking assistance at a health facility. Very few people sought assistance in another health facility – the highest proportion 21% in Ward 7 Rigo. For all villagers, access to another health facility is many hours away, even if transport is available.

In the absence of access to modern medicine, over one third of villagers use traditional remedies. The efficacy of some traditional medicines may have been long proved but in other cases, is highly unlikely.

The only improvement in access to health care has been the continued – and sometimes strengthened – presence of VHV and TB supporters in the villages.

Chart 2 Access to health facilities and VHV

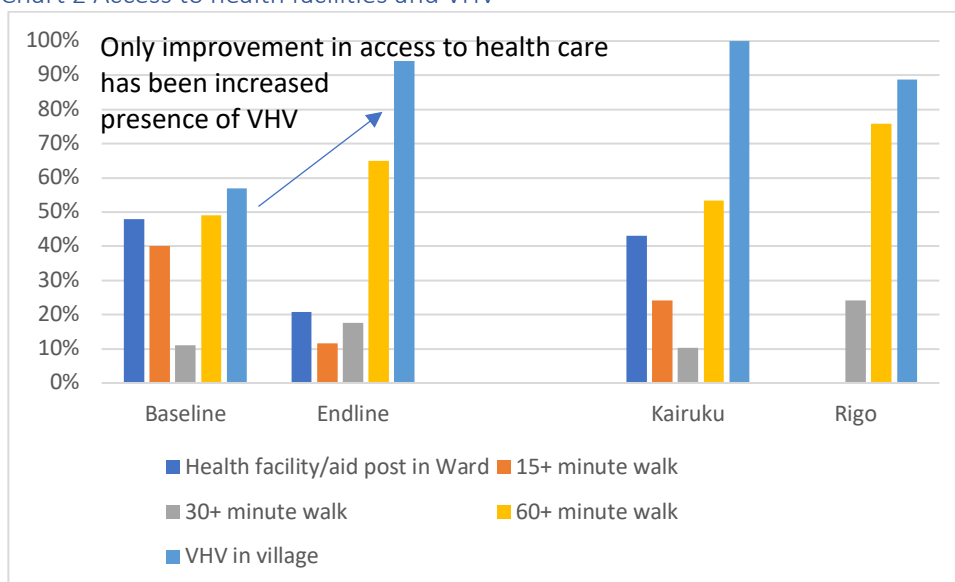
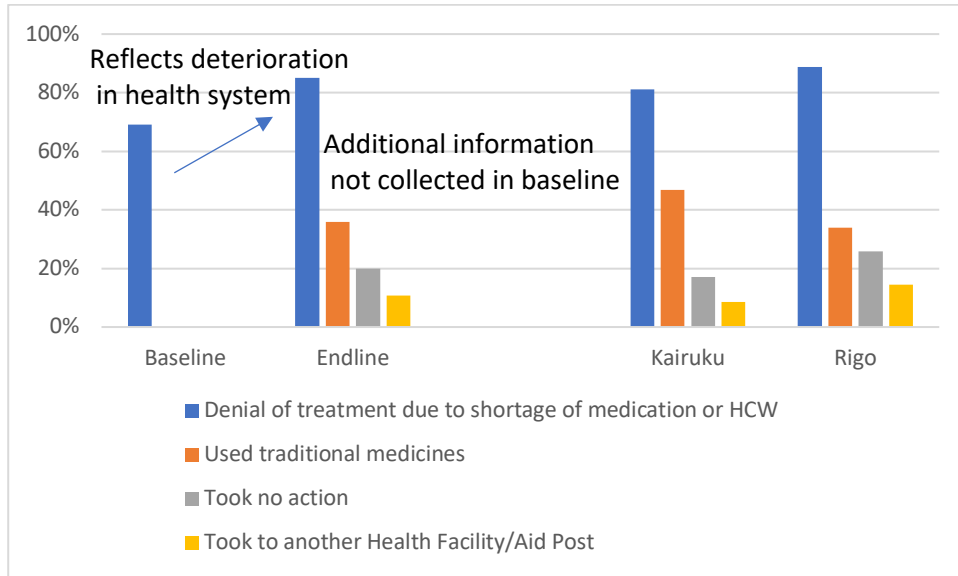


Chart 3 Access to health care services

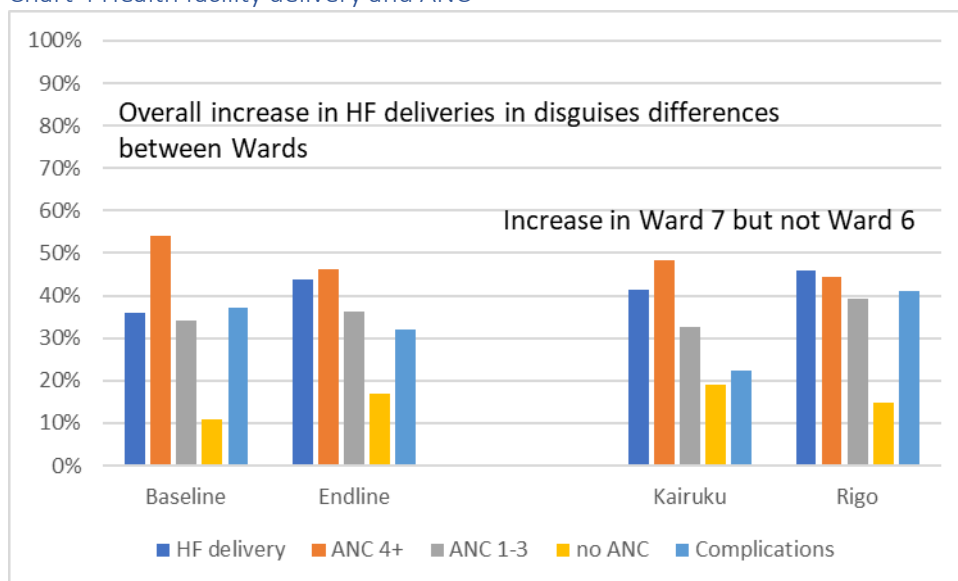


Health facility delivery and ANC – Chart 4

There appears to be a decline in the proportion of mothers receiving ANC. In 2006, 11% received no ANC and, at the other end of the scale, 54% received at least four ANC check-ups. In the surveyed Wards in 2019, 17% of mothers received no ANC and the proportion of mothers receiving four or more ANC check-ups had fallen to 46%.

Messages about safe delivery appear to be being heard and heeded in Kairuku and Ward 7 Rigo, where more mothers were delivering in the health facility – but not in Ward 6. Correspondingly, delivery complications across all births were down in Kairuku. In Ward 7, the higher level of some ANC may have identified the possibility of complications during delivery leading to mothers accepting advice to deliver in the health facility.

Chart 4 Health facility delivery and ANC



The findings in Kairuku may reflect the role of the active and motivated VHV in the ChildFund PNG villages. In all Wards, distance to the health facility is going to continue to be a

disincentive to deliver in the facility until suitable 'lying in' spaces are created, allowing mothers whose babies are due to travel to the facility before labour starts - or intensifies - and wait there for the delivery. In Bereina, whilst there is an open, outdoor platform that is used by mothers waiting to give birth, there are no improved latrines at the facility.

Knowledge and practice of family planning – Charts 5 and 6

Knowledge and practice of family planning have increased since 2006. A high proportion (83%) of women have heard about family planning and an increasing proportion of women are using family planning – and, for many, with their husband’s support. The use of family planning – and support from husbands – is lowest in Kairuku, which may reflect the stronger influence of the Catholic Church in this District. In Rigo, Salvation Army and Seventh Day Adventist churches have the strongest presence. In both Districts, four or more children is the most frequent family size.

Chart 6 shows the time between deliveries, by the mother’s age. Birth spacing sessions are given as part of outreach activities and analysis points to both encouraging and discouraging signs in relation to family planning. What is discouraging is the number of young mothers - girls not yet 20 giving birth to their second child. Mothers from Rigo make up most of this group, with an estimated 25% of mothers aged under 20 at the birth of their second child. More encouragingly, most mothers are waiting at least 20 months from the birth of one child and the birth of the next, and the second largest group are waiting at least 40 months. In both Districts, for most women, their childbearing years are over by 35.

Chart 5 Knowledge and practice of family planning

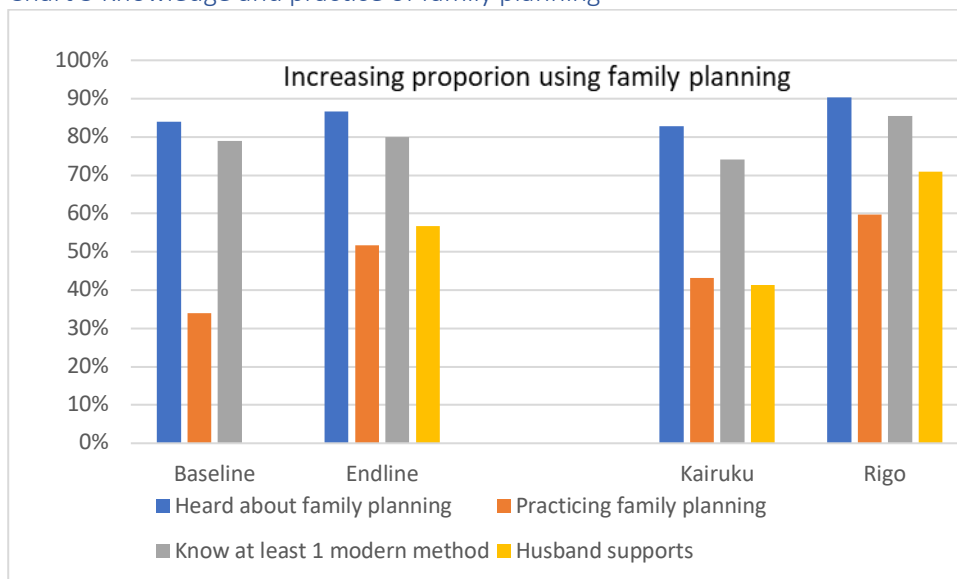
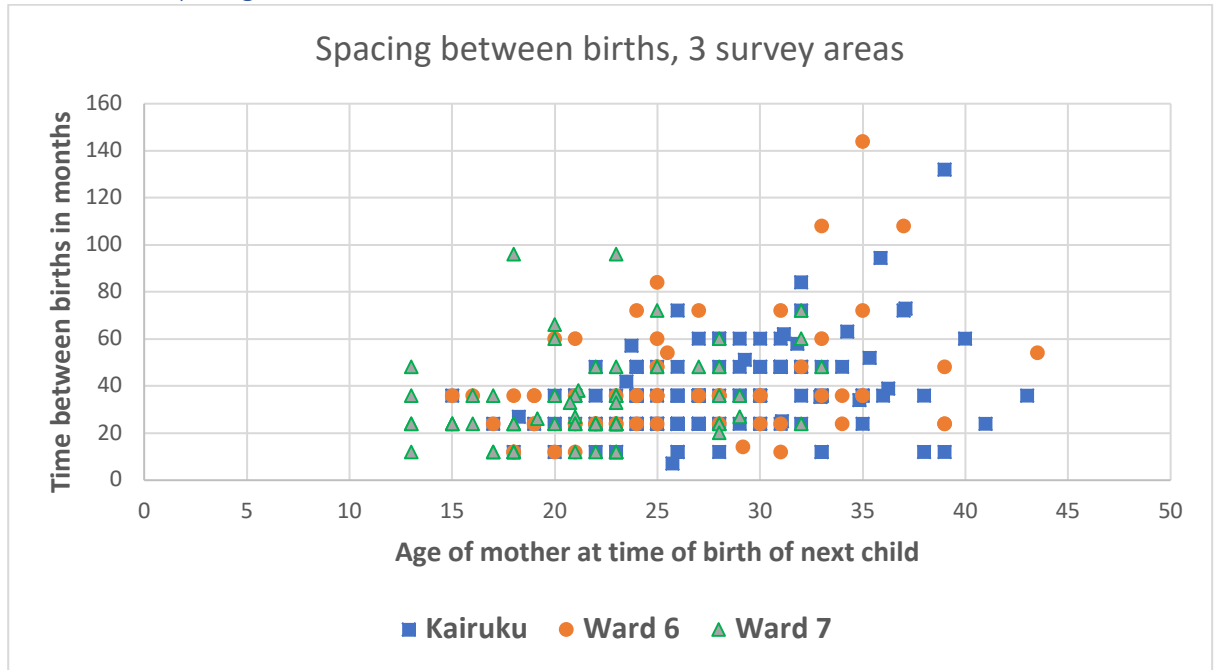


Chart 6 Child spacing



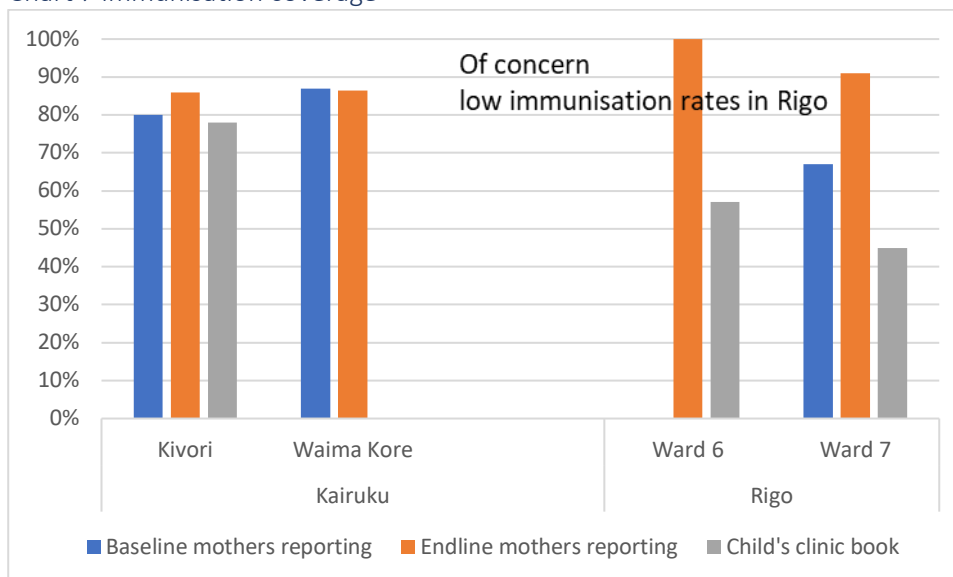
Immunisation coverage children 0-5 Chart 7

Immunisation coverage appears to differ markedly between Kairuku and Rigo – again, possibly reflecting the influence of the active and motivated VHV in Kairuku.

In Kairuku, immunisation coverage was high in 2016, as reported by mothers, and remains high, assessed both from the mothers' reporting and the child's clinic book.

Immunisation coverage assessed from the children's clinic books in Wards 6 and 7 in Rigo is lower - 57% in Ward 6 and 45% in Ward 7. Mothers' reporting is much higher - but much less reliable. Of potential concern is that the mothers THINK that the child has been fully immunised for their age whereas this is not the case for many children when compared with the entries on the child's record book.. This may indicate the need for more education of mothers about the meaning of and need for full immunisation - and a redesign of the clinic books so that it is much easier for the mother (and HCW) to identify missing vaccinations. For example, adding a column marked 'complete' for each vaccine.

Chart 7 Immunisation coverage



NOTE: Baseline survey report recorded only mothers' responses on the child's immunisation; Ward 6 Rigo was not included in the baseline survey

Monitoring children's growth and nutrition Charts 8 and 9

In Wards 6 and 7 Rigo over 50% of mothers weigh their child every month and about one third of mothers in Kairuku. In all Wards, an increasing proportion of mothers know how to interpret the WHO weight-for-age charts included in a child's clinic book.

Overall, based on the endline survey results 80-90% of the children are assessed as well-nourished using WHO weight-for-age charts. This could reflect greater attention to monitoring the child's weight as well as some increase in knowledge about food nutrition. However, HCW point out that despite their best efforts, many mothers still believe that shop bought food is best - reflecting the taste of the sugar and the fat! This points to a possible flaw in using weight-for-age charts to assess if a child is well nourished because the child may be being fed more on shop bought low protein carbohydrates and fatty foods than on high protein local foods, such as fish and greens.

The small decline in the proportion of well-nourished children in Kairuku and Ward 6 Rigo is likely to reflect the difference in season between the two surveys: the baseline was conducted in September/October when food supply is more plentiful and the endline survey in the 'hungry season' in April/May. Added to this, a cyclone hitting Kairuku and Rigo in February 2019 severely reduced food crops. In some villages in Ward 7, the cash crops - bananas, mangoes and watermelons - have been lost for this year and food gardens destroyed. People are now living on fish, supplemented by shop bought rice, flour and sago. Well water has been contaminated leaving villagers with only dirty water for drinking in the absence of tanks that can store clean water.

Planned training of VHV on nutrition, teaching mothers how to prevent children from becoming malnourished, including through growing high protein foods in their gardens, was not undertaken due to project budget cuts.

Chart 8 Growth monitoring children 0-5

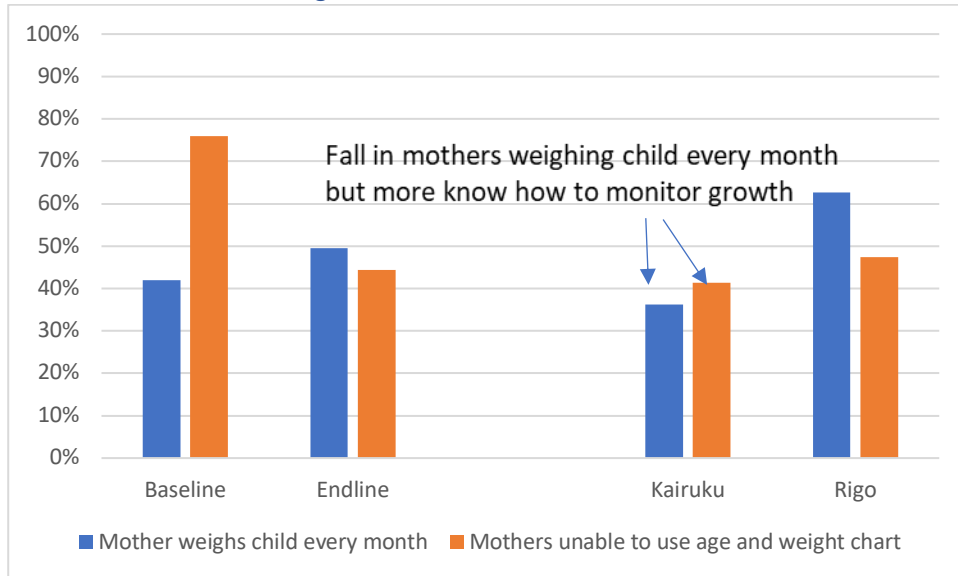
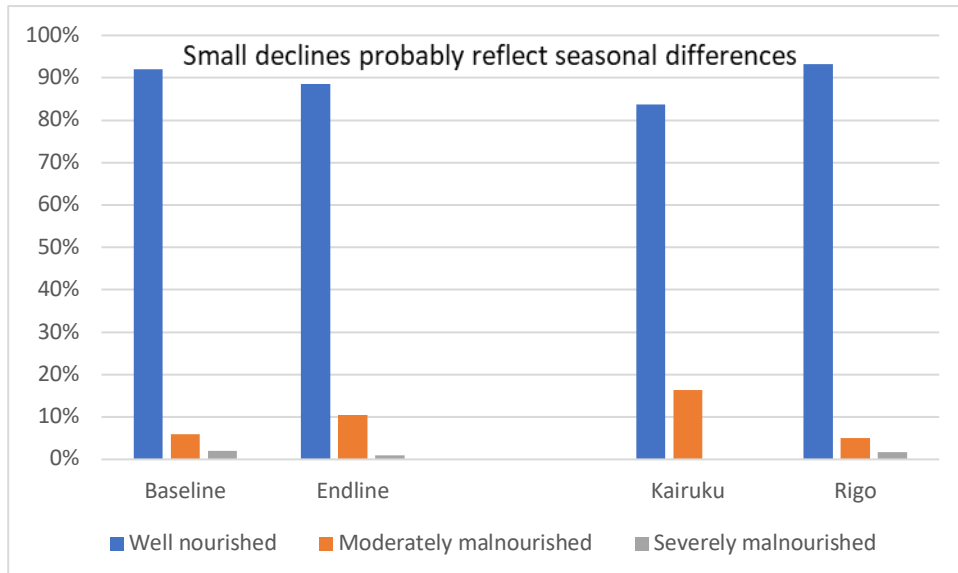


Chart 9 Assessment of nourishment children 0-5



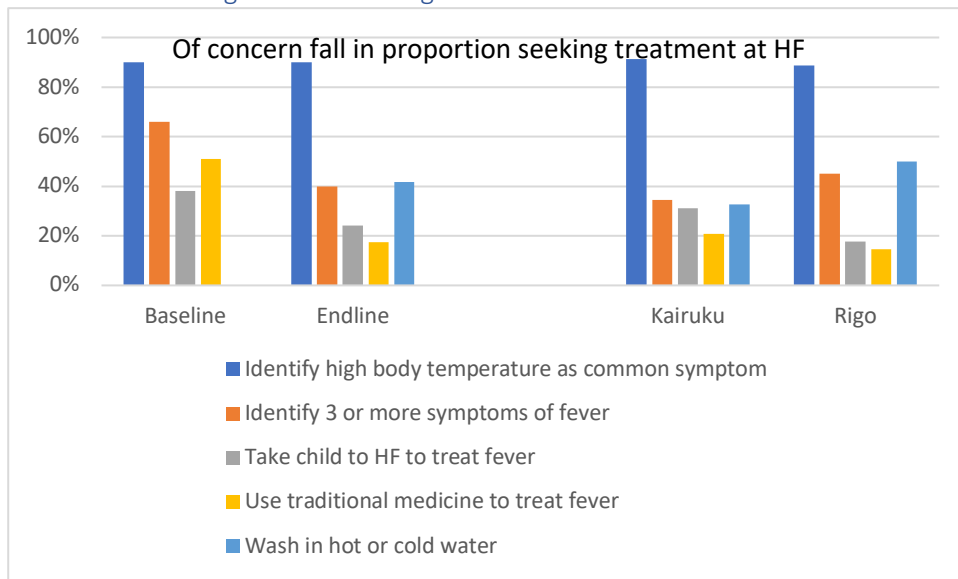
Fever diagnosis and management Chart 10

The majority of mothers (90%) recognise high temperature as a symptom of fever and whilst fewer use traditional medicines to treat the fever, fewer mothers are also taking the child to the health facility. The implication is that the fever more frequently remains untreated, with potential harmful consequences for the child’s health, such as strep infections leading to lifetime kidney damage. Fever is also a sign of malaria with potentially fatal consequences if left untreated.

Distance from the health facility – and the possibility that the mother will be turned away because no HCW are available – probably continue to act as major deterrents to seeking treatment.

Health education in relation to fever management does not appear to be working and needs to be strengthened. It is possible that this is linked to the lack of IEC materials in local languages or a more visual format, as mentioned above.

Chart 10 Fever diagnosis and management



Prevalence of diarrhea in children 0-5 and management of diarrhea Chart 11

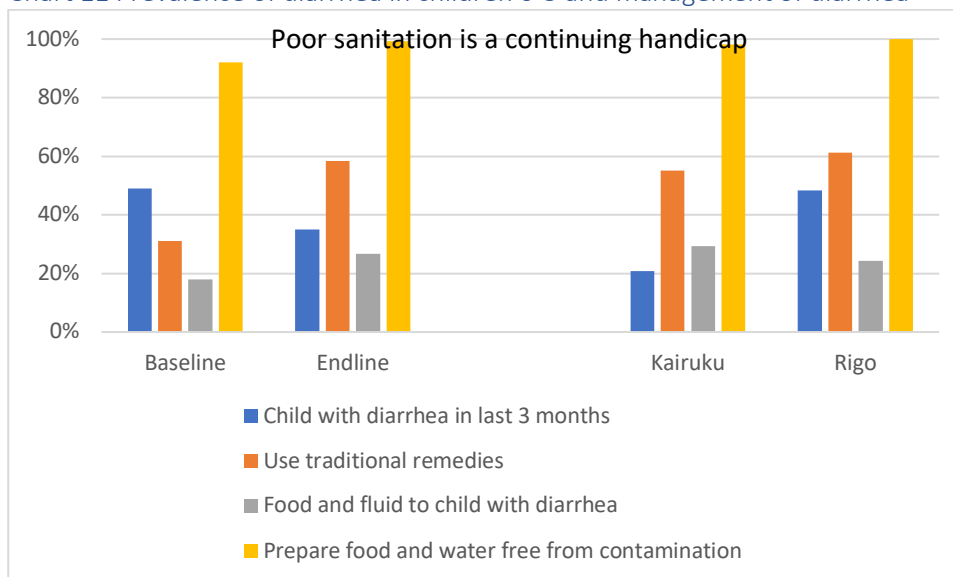
Almost 100% of mothers surveyed report that they know how to prepare food and keep water free from contamination.

The relatively low proportion of children in Kairuku who have had diarrhea in the last three months may again reflect the influence of the VHV in working closely with mothers, putting knowledge into practice. The use of traditional remedies appears to be increasing - and one of the most frequently mentioned was boiling guava leaves in water and giving the cooled liquid to the child to drink. Experience suggests that this remedy may be effective - and the leaves are freely and readily available. ORS, which needs to be acquired from the health facility – or purchased - is less frequently used.

In contrast, knowledge of the need to give the child plenty of food and water to prevent dehydration was limited – but increasing, from 18% at the baseline to 27% at the endline.

Poor sanitation is a continuing handicap to protecting children from diarrheal diseases – and this is discussed in the next section.

Chart 11 Prevalence of diarrhea in children 0-5 and management of diarrhea



Changes in access to improved sanitation and clean water Chart 12

In terms of project activities, action to reduce the incidence of water borne diseases among children through access to safe water, sanitation and hygiene has received relatively little attention. The low level of activities is attributed to project budget cuts which seem to have been borne disproportionately by the planned WASH activities: receiving only 6% of the funds spent to March 2019 versus a budgeted allocation of 12%. The impact of the budget cuts was made more severe by the increase in the cost of water tanks and of the materials for latrines.

Some activities were only undertaken in the last year of the project and others are still to be completed. As a demonstration of better sanitation practices and to encourage other villagers to follow suit, some VHV and TB supporters have been provided with the materials to build improved pit latrines: 24 in Kairuku and 15 in Rigo. IEC campaigns have focused on ‘World Days’, for example, World Water Day, with activities conducted in schools and communities. However, some teachers’ and many children’s recall of messages about health and hygiene are vague – although most knew at least one way to maintain good hygiene and when to wash their hands.

Access to improved water sources all year and access to improved latrines appear to have increased but it is difficult to relate this to the number of rainwater tanks and latrines installed as part of the project. Of an originally planned 12 water tanks, only 6 have been installed, one at the Waima health facility and the others in schools, where, having only recently been completed, not all are operational. Plans to install 60 toilets – distributed across Wards - were abandoned due to budget cuts. Six improved pit latrines have been installed in schools (but again, having recently been completed, not all were open for use at the time of the evaluation) and at the Waima health facility. Maintenance of the tanks and latrines does not appear to be part of the project.

At the schools, the latrines are located some distance from the tap or well where the children wash their hands - proximity of handwashing facilities to latrines is a strong indicator of handwashing practice. No soap was available, neither near the tap nor in the classroom. At

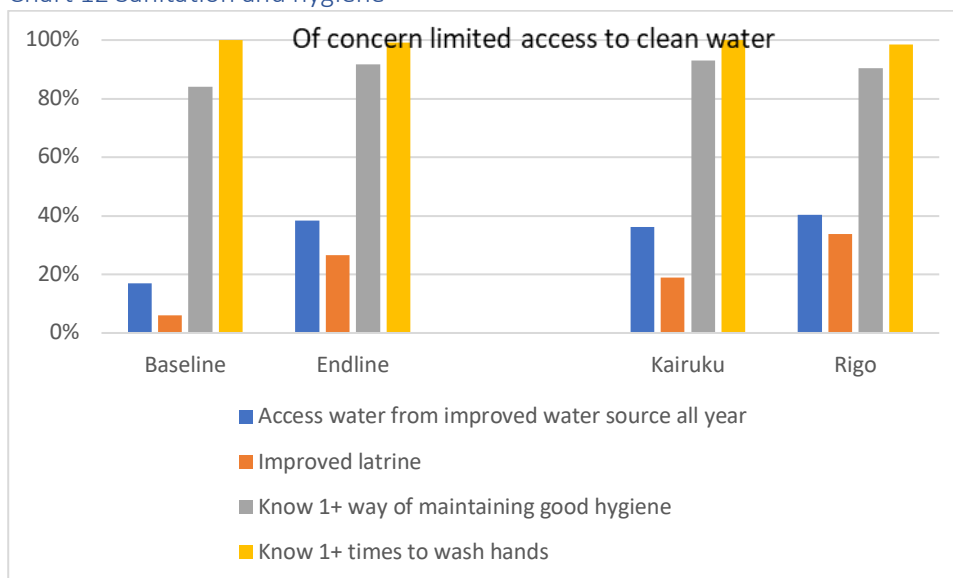
one school, the principal commented that with the money saved by the school as a result of ChildFund PNG installing the tank and latrines, the school could buy soap dispensers for each classroom and teach the children to use them.

At the school in Kore in Ward 7 Rigo, the only source of water for drinking and hand washing is an unsafe and unhygienic well. Children are told to bring drinking water from home, but, as the teachers noted, it is inevitable that some students will drink from the well - where they or others have just washed their hands.

Teachers are generally keen and enthusiastic about teaching topics on health and hygiene to their students and some have already prepared lessons based on the few resources provided by the provincial Department of Education. This seems to be an area in which ChildFund PNG could work more actively with the teachers, at a low cost for enduring gains.

Unless the environment in which mothers and children are living is sanitary and hygienic, progress against diarrheal diseases, and other water borne diseases, can only be limited.

Chart 12 Sanitation and hygiene



Evidence of improvements in health indicators

Comparing baseline and endline survey results does not produce strong evidence of improvements in MCH indicators. The most substantial improvement appears to have been an increase in the knowledge and use of family planning. In Kairuku and Ward 7 Rigo there is also evidence that health facility deliveries have increased.

Comparisons between ChildFund PNG and non ChildFund PNG villages relies on reporting from HCW, who provided a number of examples of greater gains in ChildFund PNG villages:

- Higher rates of immunisation coverage in ChildFund PNG versus non ChildFund PNG villages: in Kairuku 78% versus 45%; in Rigo immunisation rates are estimated to be as low as 20% in non ChildFund villages versus 57% in Ward 6 and 45% in Ward 7⁶

⁶ Non ChildFund villages immunisation rates based on data provided by HCW

- Mothers delivering in health facilities come disproportionately from ChildFund PNG villages: in Kairuku 26% of babies are delivered in health facilities⁷, 41% in ChildFund PNG villages; in Rigo 31% of babies are delivered in the health facility, 59% in Ward 7 but only 30% in Ward 6⁸
- Fewer new cases of TB in ChildFund PNG villages as TB outreach and TB supporters encourage treatment compliance and prevent the spread of infection: as an example, in Magautou (Ward 6 Rigo), TB cases have reduced from 20+ prior to the project, to currently 1-2 cases
- In the health facilities where ChildFund PNG has trained HCW on HIV testing and treatment, figures provided by HCW indicate that more VCCT and HIV testing is undertaken and patients are put immediately onto ART, reducing transmission risks and maintaining their health
- Active and engaged VHV and TB supporters: HCW comment that VHV have "...brought a lot of changes..." to health care knowledge and attitudes. This is possibly reflected in:
 - increasing proportion of women using family planning: 43% in Kairuku and close to 60% in Rigo, and many with their husband's support
 - 80-90% of the children assessed as well-nourished based on WHO weight-for-age chart

In the health facilities where ChildFund PNG has trained HCW on the integrated management of adolescent and adult illness in relation to HIV testing and treatment, more VCCT and HIV testing is undertaken. Whilst this yields more registered cases, patients are put immediately onto ART, reducing transmission risks.

Despite these gains, the survey results indicate some less encouraging evidence of the impact of the project on health indicators:

- in Rigo, particularly in Ward 7, immunisation coverage remains low - 45% compared with 78% in Kairuku. The only comparative rate is the measles vaccination coverage - 32% in Kairuku and 21% in Rigo⁹
- in Kairuku and Rigo Ward 6, the majority of mothers still deliver at home. HCW and VHV both report that even some mothers living close to health facility at Waima continue to choose to deliver at home
- over 80% of mothers have been turned away from a health facility due to shortage of medicines or the unavailability of HCW and this proportion appears to have increased since 2016
- health facilities remain understaffed and the HCW over worked. In Waima and Kwikila the buildings are rundown - hot when the sun shines, and leaking when it rains
- the only regular outreach is that organised by ChildFund PNG
- HCW report little demand for condoms suggesting that people continue to exchange in risky sexual behaviours. People are reluctant to go to a health facility for STI diagnosis and treatment until they are "in trouble" - symptoms are not recognised as an STI and treatable. Amongst women, most STI cases are detected as part of ANC. In Bereina, HCW report seeing a small but increasing number of cases of gonorrhoea and syphilis - two STIs that can cause severe complications

⁷ Provincial and District Health Profile, National Department of Health, Kairuku-Hari District, Central Province, 2018

⁸ Figures provided by HCW at Kwikila Health Facility

⁹ Provincial and District Health Profile, National Department of Health, Kairuku-Hari District, Central Province, 2018

- an HIV hotspot has developed in Waima – 15 people are on ART, 3 males and 12 females (3 aged 16-18 and 9 are mothers)
- people living with HIV report that stigma and discrimination remains high in the villages. As noted earlier, this is contributing to high rates of loss to follow-up amongst people diagnosed as HIV+
- numbers and ages of children indicate that family size remains high (4 or more children) and amongst young mothers (<20) in particular, child spacing limited:
 - in Rigo Ward 7 35% families already have 4+ children, and 65% of the mothers of these children are under 30 and, as young mothers, likely to bear more children
 - in Kairuku 48% families have 4+ children, and 43% of the mothers are under 30
 - the exception may be Rigo Ward 6 where 50% of families have 4+ children, but only 35% of the mothers are under 30 – and, as older mothers, less likely to bear more children

Gaps in project coverage of priority issues

There are three gaps in the project's coverage of priority issues. Two concern resilience – one community resilience and the other the resilience of the volunteers who support the project's activities. The third relates to the lack of explicit inclusion of children living with disability.

Strengthening community resilience

This had been recognised, at least in part, as important in the project's initial design with an intended activity to conduct training on nutrition and backyard gardening. However, as a result of budget cut, its implementation was dropped.

Including livelihood activities as part of health interventions could be used not only to improve nutrition but also to encourage greater self-sufficiency and increase food security. In Kairuku, establishing more food crops near the villages could have the added advantage of reducing the amount of dust and sand blown about by the wind coming off the ocean. The dust is reported to be a cause of coughs and asthma, particularly in children. Health interventions also need to be increasingly aware of the greater risks of water borne diseases as climate change leads to warmer water supporting more pathogens.

The coastal villages of Kairuku, situated on a long flat sandy strip behind the sand dunes and the sea, experience frequent cyclones. The most recent hit the area in February 2019, destroying the Catholic Church and the aid post at Kivori and damaging cash and food crops. People have no safe places to shelter: in cyclones people huddle under their bush houses.

Maintaining the involvement of VHV and TB supporters

How to attract and maintain the involvement of VHV is one of the most frequently asked questions in relation to aid projects. For this project, ChildFund PNG trained 50 VHV, TB supporters and PHAST¹⁰ volunteers¹¹ and the health team reports that 'very few' are no longer active.

¹⁰ Participatory Hygiene and Sanitation Transformation

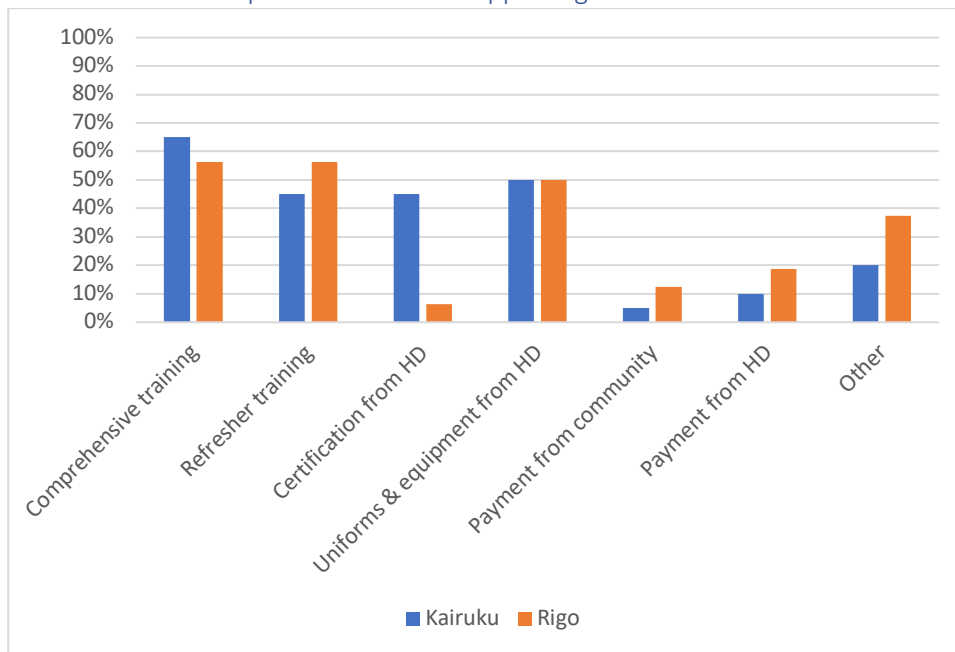
¹¹ Number based on information provided in 2017-2018 and 2018-2019 monitoring reports

As noted in the discussion in preceding sections, the active involvement VHV and TB supporters has contributed greatly to the project’s achievements. More broadly, health volunteers are acknowledged as the key to sustaining better health outcomes in villages, and in the context of PNG, the only way in which a project can be scaled up given the constraints imposed by the health system.

Helping VHV to generate a small cash income is often suggested as a way to make their role more self-sustaining. Payment from the NGO can be a two-edged sword - it can encourage people to volunteer whilst the agency is active but when the project ends and payments cease, volunteering can cease. A recent example from the ChildFund PNG project area is provided by RAM: the project initially paid parents to clean tall grass and remove still water from around houses, when payment stopped the parents stopped. RAM are now recruiting students to keep the area around their houses clean.

An interesting finding from the endline survey is that very few VHV (and TB supporters) list payment from either community or the provincial DOH as a requirement for their continued activity. What VHV list as most important to them are more training, and uniforms and equipment from the provincial DOH (Chart 13).

Chart 13 What is important to VHV in supporting their role



Pathways to sustainability need to recognise differences in community attitudes towards paying volunteers and a community’s capacity to pay, in any form, cash or in-kind. Payments in cash could involve a patient fee for service, payment from a community fund to which all are asked to contribute or a levy per household.

Depending on community attitudes, if people are asked to contribute cash or in-kind to VHV, they may cease to use them as a community health resource and fall back on old ways; and, it may create ill feeling towards VHV, further diminishing the value of their training.

Helping VHV to generate a cash income, for example, by establishing social businesses, requires that people in the community have the cash to buy from the businesses. Some communities in the areas in which ChildFund PNG is working have very limited capacity to generate cash (refer Box 1 for a case study based on villages in Kairuku) whereas other

villages have established commercial scale agricultural activities and are generating cash incomes (for example, watermelon and pineapple farming in Rigo).

Advocating for government recognition of, and action on, the value to the health system, of VHV is a possibility, but a long term one.

Enduring pathways for VHV to become self-sustaining are likely to come from villagers and VHV own resourcefulness. Given the vastly different socio-economic characteristics of villages, even across Central Province, it is highly unlikely there will be a 'one size fits all' approach to achieving VHV sustainability.

Marasin stoas (*medicine shops*) are a possibility in communities generating cash surpluses. Refer to Box 2 for an outline of how marasin stoas could work as social businesses.

Box 1

Understanding villagers' capacity to pay VHV and TB supporters

Example: Waima and Kivori, the poorest villages

- Main sources of income: mangoes and remittances
- Mangoes: 2-3 trees, 2-3 50 kg bags per tree @ K400-500 per bag = K4,500
 - Totally dependent on season, ability to transport mangoes to POM and market prices
 - Mango harvest is only time when cash in the villages – all spent, none saved
 - Selling costs = PMV K50 (return) and K120 for bags = K170
- Remittances: received by 40% of households = K1,300 pa mainly 'in kind'
- Requirements for cash: schooling, shop bought food, PMV, phones
 - Schooling costs (K500 per child x 4 (average number of primary school age children per family) = K2,000
 - Shop bought food and cash items (flour, tea, rice, etc) = K300 per month = K3,600
- **Income + remittances = K5,800; requirements for cash = K5,600**
- For households without remittances, capacity to pay in cash severely constrained

Compare with VHV or TB supporters earnings from roles

- Daily allowance K40 – paid for assisting with outreach
 - 4 sessions in each Ward over 12 months = K160pa
- Special allowance if take lead in preparing for events such as World AIDS Day K60 fixed payment
 - 3 special allowances over 12 months = K80
- Special campaigns allowance eg, polio, Endline survey, DFAT visit, World Days, K40 per day
 - 5 special campaigns over 12 months = K200
- Totals K440 – K540 pa
- Would require a levy of about K10 per household per annum
 - 5% of estimated average cash 'surplus' for households receiving remittances
 - Could households without remittances pay?

Box 2

Could marasin stoas - medicine shops – provide an income source for VHV?

As a simple example, marasin stoas could be established in villages as social businesses selling health related products, such as soap, toothpaste, toothbrushes, mosquito nets, bandaids, ORS packets, etc, with the initial stock bought by an organisation like ChildFund PNG, the marasin stoaa kipas use the proceeds from sales to buy more items from ChildFund PNG and generate a small profit. The stoa could be run from the VHV's house, from a small structure in the grounds of the health facility or in the village market.

Inclusion of children living with disability

The baseline survey did not collect information on children living with disability. As a result, as the project began in 2016 these children were not explicitly identified. In some cases, the VHV has been aware of children living with disability in their village and taken it upon themselves to keep a watchful eye on the child. For example, this is the situation in Kivori (Kairuku) where a VHV is 'monitoring' two children under 5 who are unable to walk.

Overall, the endline survey identified 7 children living with disabilities. In considering this number it is important to recognise that there may be a reluctance on the part of mothers to acknowledge a child with disability or, for example, in the case of children with mild vision or hearing impairment, a failure to recognise the disability. For example, a child with severely crossed eyes was not regarded as disabled by the mother although the child's appearance is likely to affect its future. Skilled but routine surgery could correct the problem.

In Kairuku, the endline survey identified five children with disabilities: two vision impaired (one 8 months old); one with a deformed arm (9 months old); one unable to walk (1-year-old); and one developmentally delayed. Another child had a malformed penis, which probably could be corrected with simple surgery and remove the risk of urinary tract infections. Four of the five children had been vaccinated, with the three youngest up-to-date on immunisation.

In Rigo, the endline survey identified two children with disabilities: one experiencing difficulty with movement and another with a speech impairment. In Ward 6, a teacher at the Magautou school identified one child with hearing impairment, one with vision impairment and "a few" with learning difficulties. In Ward 7 at the Kore school there was at least one child with learning difficulties.

Given the severe resource constraints under which the health facilities operate, children living with disabilities are almost certain not to receive necessary diagnosis, treatment and care in their communities. This is an issue that could be included in future ChildFund PNG health projects, and the children living with disabilities identified through the endline survey followed-up by the health team, with the education team alerted to disabilities amongst school aged children.

Drawing lessons from the design and implementation of the project

The current integrated project grew out of ChildFund PNG's experience with a series of single focus health projects over the preceding 7-8 years, some with a narrow geographic focus and others covering the province. The integrated project was designed to cover all

major aspects of the health of mothers and children, adolescents and adults, but its geographic focus was to be on 8 Wards - 6 with widely scattered villages and two villages that are Wards. The project was ambitious in its design and its implementation – and, as a consequence, has yielded many valuable lessons.

Evaluating the project provides an opportunity to re-examine the relative gains in terms of improvements in health indicators from integrated versus focused projects, and from projects with a wide geographic coverage versus those focused on a few areas. HCW and VHV are crucial to the success of health projects and their views on lessons learnt are invaluable input into future project design and implementation.

Benefits of an integrated project:

HCW argue that health care awareness, through static clinics and outreach, on all aspects of health, is the most effective intervention in keeping families healthy:

- mothers attend clinics for ANC, delivery and post-delivery care
- children are immunised
- people present for TB and HIV testing
- it creates opportunities to promote STI awareness and testing and treatment among adolescents who are not caught by ANC or TB or HIV testing
- it allows a relatively quick response to malnutrition in children and people can be encouraged to grow and eat local foods
- sanitation improves
- people are more aware of the need to keep food and water free of contaminants

HCW argue that an integrated program creates greater opportunities to build trust between themselves and VHV and their communities because people see and feel the benefits more quickly. A mother is assisted in the delivery of her baby, the baby is immunised and weighed regularly. Diarrheal diseases are reduced, and babies and children grow. People with TB are treated, and the spread of infection stops. People with HIV are given treatment and can stay well and healthy. In a focused project, VHV are used predominately to mobilise villagers, reducing their value as health resources in the villages.

Projects focused on a single health issue lose the opportunity to deliver multiple related health messages. Campaigns such as the current NDOH/WHO polio vaccination campaign are described by HCW as “more in/out”. The vaccination team arrives, the children (in this case aged 0 - 15) are vaccinated and the team leaves...

HCW are divided on the benefits of delivering multiple health care messages in quick succession: for some, change holds the interest of VHV and villagers and for others, change the message and people forget the previous one.

Benefits of a focused project:

A focused project, that is, one that concentrates on improving one health indicator through the delivery of one health service, would usually allow greater geographic coverage. This is particularly so in PNG where the health infrastructure is weak and overstretched. To fully reach its potential an integrated project requires a substantial investment in the health system - from facilities to drug supply to staff numbers and training. Given the lack of health system resources, it is easier in a focused project to backup training and refresher training with necessary equipment and supplies and thus to retain more of the benefit of the training -

rather than having it lost because HCW are unable to put new knowledge and skills into practice.

An example of an effective focused project with wide geographic coverage is ChildFund PNG's 2015 immunisation campaign, which achieved 85% coverage of children aged 0 -5 in Central Province at an average cost of PNK15 per child. This compares with an immunisation rate achieved during the current integrated project of 78% in Kairuku, 57% in Rigo Ward 6 and 45% in Rigo Ward 7. Unfortunately, information on the cost per child immunised is not available.

Another example of the gains that can be made through a more focused approach but one that covers a wide geographic area, is the work of ChildFund PNG to train all HCW on HIV testing and treatment on behalf of the Central Province DOH. This allowed uniform and timely training of the selected HCW. This was done as part of the current integrated project – taking one activity and applying it to the Province.

Working through time in a defined geographic area builds up knowledge of the factors that should influence project design and implementation, allowing the tailoring of interventions and messages to the needs and interests of the villagers.

Working through time in a defined geographic area should also allow a project to progressively build up the capacity of the local health resources - health facilities, HCW, VHV and TB supporters. This has the potential to reduce future project 'start up' time and costs. For example, TB supporters recruited and trained as part of the 2013-2016 TB project in some of the same villages as the current project, were rolled into this project. The current project was also able to build on the TB awareness raising undertaken by the ChildFund PNG health team, HCW and TB supporters between 2013-2016.

Counter to this is the lack of compelling evidence of the project gaining greater traction in Ward 6, where ChildFund PNG has been working in five of the same villages for 13 years. In the areas where ChildFund PNG projects have taken direct action - improving access to both clean safe water and improved latrines, Ward 6 ranks more highly than Kairuku, where ChildFund PNG has been present since 2013, and Ward 7 where ChildFund PNG has operated in some villages since 2011. However, on health indicators such as family planning, ANC, growth monitoring and child nourishment results from Ward 6 are no different to those from other Wards, and on some indicators results from Ward 6 are worse: delivery in the health facility, immunisation rates, incidence of diarrhea, and seeking treatment for fever. The apparent lack of greater traction in Ward 6 may be explained by the difficulties of accessing the Kwikila health facility - for 90% of mothers the facility is at least an hours walk away, and having reached the facility, 90% of mothers have been turned away because of a lack of drugs or the absence of HCW. The only ready access to health care is from VHV who are present in all Ward 6 villages. However, almost 50% were last trained more than a year ago and it could be up to 5 years ago that some were last trained.

Another factor that could be having a major influence in Rigo is the strength of customary beliefs. An HCW at Kwikila commented that these remain the strongest influence on people's behaviours: "believe in God by day, at night in sorcery".

Matching interventions to where gains are likely to be greatest

Not all interventions are suited to the one approach - to being part of an integrated project or a focused approach, with a wide or a narrow geographic focus.

There is a group of interventions where an integrated project taps into scope economies and works well in a focused geographic area, largely because resource constraints work against an effective and cost-effective wider coverage. This group includes interventions directed at MCH and child immunisation, sexual and reproductive health, HIV, TB and malaria. These are all interventions where regular testing, treatment and monitoring, is needed, and where the interventions are seeking to promote behaviour change.

There is another group of interventions where a wide geographic coverage, but more focused project is likely to yield more effective and more cost-effective health outcomes by tapping into economies of scale. Examples include one-off interventions such as the polio campaign or ongoing programs such as Rotary Against Malaria (RAM). RAM focuses solely on the prevention and treatment of malaria, working to a cycle of returning to an area every three years after an initial period of intensive awareness raising.

The most crucial considerations in determining the design of a project are:

1. a realistic assessment of health sector resource availability, capacity and motivation - and of ChildFund PNG's capacity to influence these factors. Health facilities, HCW, drugs, medical supplies, logistics, are all severely constrained and are largely beyond the capacity to ChildFund PNG - or any NGO - to address.
2. a realistic assessment of ChildFund PNG resources - staff and budgets over the life of the project. The design and coverage of a project needs to be matched to the availability of sufficient skilled people and the availability of adequate funds to implement the project, as designed.

Expenditure to achieve project objectives

An original budget of AUD1.720m was reduced to AUD1.620m over the life of the project, with AUD1.333m spent to March 2019.

As noted earlier, the nature of the project and the interactions between interventions, most undertaken within the constraints of the health system, make a meaningful analysis of 'value for money' difficult - and one likely to yield uncertain results. In the one intervention where implementation was largely within the control of ChildFund PNG (Objective 3: seeking to reduce the incidence of water borne diseases through improved sanitation and hygiene) 'value for money' would appear to be low. However, this is hard to judge because late or incomplete implementation of some planned activities means that whereas impacts to date are minimal they may increase as infrastructure is completed and IEC activities build upon this.

Even without these difficulties, accurately judging 'value for money' would still be extremely difficult because of the way in which the project's accounts are kept. The accounts record budgeted and actual expenditure by category of outputs. Some of these categories are very broad. For example, Conduct Integrated Community Health Services appears to cover all the direct health services provided to children and adults by the project. The accounts do not show expenditure by activities such immunising children <5 or even delivering health services to children or mothers or HIV or TB patients.

Using the information available, it is possible to look at the share of expenditure by the project's three objectives, by the share of expenditure allocated to those activities which

could be identified from the accounts, and, by drawing on the limited data available, to make some assessments of the cost per activity.

The total and share of expenditure on achieving the project's three objectives is shown in Chart 14. Reflecting the labour intensity of the project and the high costs of implementing projects in PNG, personnel and overhead costs account for 58% of the total, AUD825,280.

Chart 14 Expenditure by project objectives: actual allocations based on revised budget of AUD1.428m

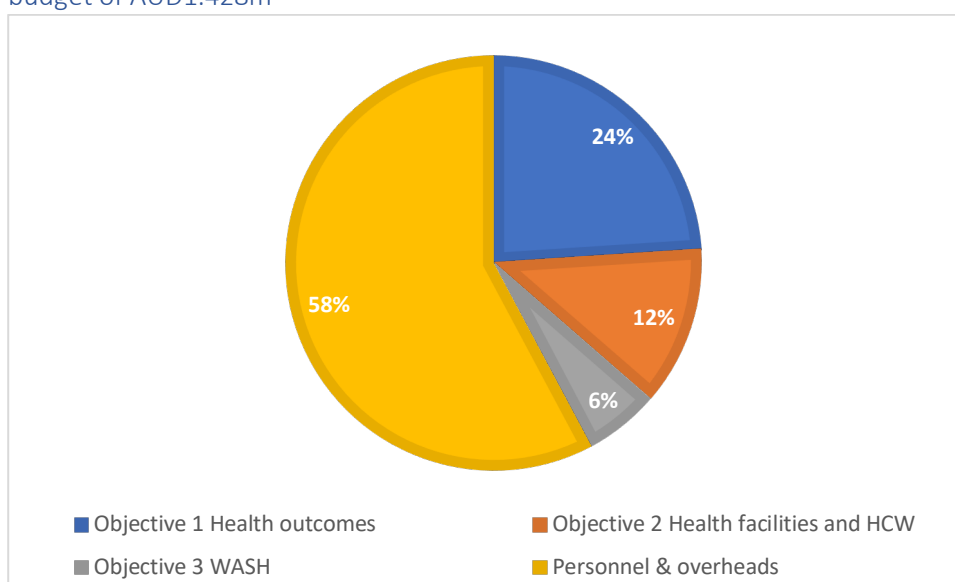
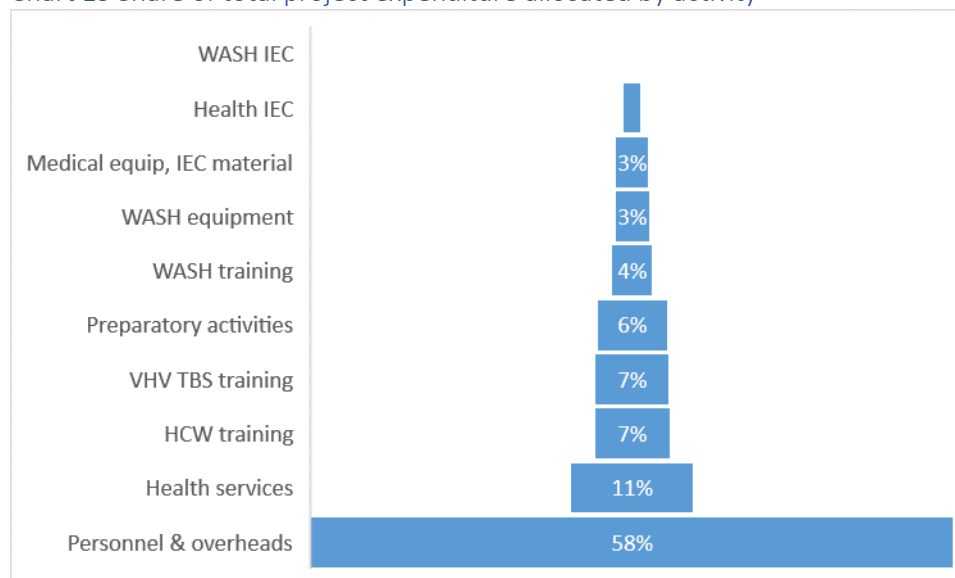


Chart 15 details expenditure by activity where these could be identified from the output categories shown in the accounts. On this basis, 14% was spent on training HCW, VHV and TB supporters: 7% on training HCW and 7% on training VHV and TB supporters. Just 11% was spent on delivering health services based on the category 'Conduct Integrated Community Health Services'. The amount spent on preparatory activities was estimated by aggregating categories such as Project inception meeting with the Department of Health and other key partners', and 'Organise Health Outreach Teams in the district and assess availability of human resources and medical equipment'. These preparatory activities account for 6% of project expenditure. WASH training and equipment (water tanks and latrines) accounted for 4% and 3% respectively of expenditure. The amount spent on medical equipment and health related IEC material was taken from the category 'Provide support for appropriate medical equipment and IEC materials required by VHV's and health staff to conduct health awareness and education sessions'. Health IEC (2%) was estimated by aggregating categories referring to events associated with celebrations of World TB Day and World AIDS Day. The accounts record no expenditure against the category 'IEC Campaigns conducted annually for World Water Day, Global Hand Washing Day and World Toilet Day'. Given activities are reported in the six-monthly reports, the expenditure must have been drawn from elsewhere – possibly included as part of WASH training.

Chart 15 Share of total project expenditure allocated by activity



Source: estimated from project accounts

Available data allows the estimation of the cost per beneficiary of only three activities: aggregated provision of health services ('Conduct Integrated Community Health Services'), VHV and TB supporter training and the provision of water tanks and latrines. The figures shown in Table 5 are based on expenditure in 2017/2018 and the first two quarters of 2018-2019 and the number of beneficiaries as identified in the monitoring reports for these periods. These are the only time periods for which numbers from the accounts can be matched with numbers from the monitoring reports. Note that the estimates are based only on the direct costs - the personnel and overhead costs are not included, nor the project preparatory costs (defined above). As a result, at best, the estimates of expenditure per beneficiary are lower bounds, for example, expenditure on VHV and TB supporter training is estimated to be at least AUD1,212 per person trained.

It is also important is assessing 'value for money' that resources developed by the project can be leveraged by other health related projects. For example, RAM, in starting their anti-malaria campaign in Kairuku, used ChildFund's VHV network and acknowledged the value that this created for RAM.

Table 5 Estimated direct expenditure per beneficiary of activities for which data available

Activity	Direct expenditure from project accounts AUD	Number of beneficiaries from monitoring reports	Estimated direct expenditure per beneficiary AUD
'Conduct Integrated Community Health Services'	60,982	4,562	13.37
VHV & TB support training	29,086	24	1,212
VHV exposure visit	15,123	14	1,080

		Units	Children estimated number	Units	Children
Water tanks Kairuku	10,538	3	200	5,224	78
Water tanks Rigo	15,671	3	200	3,513	52
Latrines Kairuku	9,154	6	200	2,340	47
Latrines Rigo	9,360	4	200	1,526	46

Wasted resources

Although outside the direct control of ChildFund PNG, the project areas in Kairuku contain at least two examples of the waste of resources in a severely resource constrained environment. These are being drawn to the attention of ChildFund PNG as it is the only organisation with the capacity to lobby The World Bank or PNG government agencies to complete the two buildings and get much needed resources into the hands of the communities they are intended to serve. Action is included as a recommendation in the following section.

At the health facility in Waima The World Bank provided funds to erect a three-room building behind the clinic. This building is 90% completed but unusable by HCW - or others - because the fittings have not been installed and the building not officially handed over to the health facility because it is incomplete. The water tank had not been connected by the original contractor - and a ChildFund contractor and volunteers were in the process of doing this during the evaluation visit. The HCW list among the things that would make their roles easier accommodation for locum nurses to allow them to take a break and to ease their work loads. Other urgent uses for the rooms include a TB treatment area and a lying-in ward for expectant mothers, to encourage them to come to the facility as their labour begins rather than remaining in the village and giving birth there.

At the school at Kivori, where the ChildFund PNG health project has provided a water tank and latrines, and ChildFund PNG has provided books for the library, The World Bank provided funds for the construction of a double classroom. This is about 50% complete - the frame was erected and the roof put up but then worked stopped. There is no way that the school board can raise the funds to complete the building and the new principal has no way of resolving the dispute between The World Bank and the contractor. The new classrooms would provide much needed space for the students.

Recommendations

It is difficult to make definitive recommendations about the further development of the current project, or of other health projects, because the major barriers to success are firmly outside the control of ChildFund PNG - or any other NGO.

The most critical barriers are the national government-controlled system to procure, supply and distribute medical supplies, and the lack of sufficient support for the health system, in terms of infrastructure, equipment and staff.

As a result of the severe constraints under which the medical supply system operates, the supply of drugs and other proscribed medical provisions to health facilities is inadequate and unreliable. This problem has been recognised for many years and despite numerous attempts to overcome its failings, the problem persists.

The health system continues to suffer from a lack of resolve to address other problems as well: run down and poorly equipped facilities and a chronic shortage of trained and motivated HCW.

The result for organisations such as ChildFund PNG is that the no matter how effective their interventions, such as training HCW and VHV and the purchase and placement of specific capital items lacking in the health facilities, unless the system can back this up with necessary drugs and other medical supplies and adequate numbers of trained HCW, health indicators will not improve - and in some cases, decline.

Lobby for health system strengthening

It is recommended that ChildFund PNG, with ChildFund Australia, work with other NGOs to lobby the PNG government to make significant improvements to all elements of the health system. In this context, it is important that all stakeholders understand that sustained improvement in health indicators cannot be achieved whilst ever the activities of NGOs, no matter how well designed and implemented, in practice, apply bandaids to a broken system.

Plan investment in projects within the constraints that the system imposes

Do what experience has shown is feasible and most likely to generate lasting results.

In choosing between different interventions, addressing different health issues, consideration needs to be given to likely net project benefits, that is, to the benefits taking into account the direct and indirect costs of the structural weaknesses in the health system that are beyond the control of ChildFund PNG. Assessing project benefits on the assumption that the costs of these structural weaknesses do not exist or can be overcome will make some projects look more attractive than will be the case in practice. The result will be little 'value for money'. Projects that can work around the structural weaknesses are likely to deliver the best 'value for money' – even if these projects would be given a lower priority if the health system constraints could be removed.

To assist in judging the likely benefits of different types of projects, the interventions from the current ChildFund PNG project have been classified by their potential impact, need for continuous action, coverage to sustain benefits, reliance on the strength of the government health sector to achieve their outcomes, and ChildFund's capacity to undertake the intervention, working within the health sector constraints. This is shown in Table 5: interventions marked in **green** are those that ChildFund PNG could undertake with the least direct involvement of the government health sector; **orange** marks interventions that require some input from the government health sector to be able to achieve their full potential; and **red** marks interventions whose outcomes are heavily reliant on the strength of the government health sector. By definition, this is an overly simplistic categorisation but it is designed to guide consideration of different interventions as part of integrated or focused approaches.

Table 6 Indicative categorisation of interventions by impact and potential to deliver benefits

Intervention	Potential health impact	One-off or regular	Coverage to sustain benefits	Reliance on government health sector	ChildFund capacity to undertake

Childhood immunisation	High – protects child for life	Regular as new babies are born	As wide as possible – herd immunity	Supply of vaccines, HCW and transport	Facilitate outreach
Access to HF	High	One-off		Support for HF – building, equipment, medical supplies, HCW	Supplement equipment
Family planning	High	Regular	Wide or focused	Supply of medical contraceptives	Facilitate outreach, supply non-medical contraceptives, train HCW and VHV
Delivery in HF	High	Regular	Wide or focused	Support for HF – building, equipment, medical supplies, HCW	Supplement equipment, train HCW and VHV
ANC	High	Regular	Wide or focused	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and VHV
Growth and nutrition	High	Regular	Wide or focused	HCW	Facilitate outreach, train HCW and VHV
TB testing, diagnosis, treatment and care/support	High	Regular	As wide as possible – prevent spread	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and TB supporters, emphasis on prevention
HIV support testing, diagnosis, treatment and care/support	High	Regular	As wide as possible – prevent spread	Support for HF – building, equipment, medical supplies, HCW	Facilitate outreach, train HCW and VHV, emphasis on prevention; reduce stigma and discrimination
STI testing, diagnosis and treatment	High	Regular	As wide as possible – prevent spread	Support for HF – building,	Facilitate outreach, train HCW and VHV,

				equipment, medical supplies, HCW	emphasis on prevention, target adolescents
Malaria support	High	Regular	As wide as possible – prevent spread	Medical supplies	Facilitate outreach, train HCW and VHV, emphasis on prevention*
WASH	High	One-off	Wide or focused	Not required	With communities, materials and IEC
VHV/TB supporters	High	Regular	Wide or focused	Not required	With communities, training and IEC
*Note: scope to work with RAM					
Interventions not included in the current project					
Identifying and working with disabled children	High	Regular	Focused	HCW	With communities, train HCW and VHV, seek input from specialist volunteers
Increasing community resilience	High	One-off	Focused	Not required	With communities, training and IEC

Specific recommendations for action in relation to interventions

In assessing the impacts of different interventions, some specific recommendations were made in the report. These are summarized below, with some sense of priority:

- urgently address apparent HIV hotspot in Waima with 15 HIV+ patients, including three girls aged 16-18 and 9 mothers; and at least one mother is lost to follow-up
- assist HCW with strategies to trace HIV+ patients lost to follow-up: 5-6 pregnant mothers in Bereina and 24 in Kwikila.
- work with HCW and communities to reduce stigma and discrimination against people living with HIV to both encourage more testing and reduce loss to follow-up
- raise awareness in relation to STIs - symptoms and treatment - and consider additional ways of increasing regular STI examination and testing, particularly amongst adolescents to reduce risks of HIV transmission and other health consequences. This is particularly urgent in Kairuku given the HIV hot spot.
- repair the well at the Kore school to make it safe for the children to use, and, if possible, a safe source of clean water. Investigating this may provide an opportunity to work out how to pipe the water from the well to a handwashing station nearer the latrines.
- consider if ChildFund PNG can follow-up on the incomplete structures in Kairuku: the building at the Waima health facility and the school classroom at Kivori
- consider building more latrines in the schools - the current project builds two per school, regardless of the school population. Explore ways of installing hand washing stations near the latrines, for example, piping water from wells or taps and encouraging schools to provide soap

- consider providing more IEC material on health and hygiene to schoolteachers, in association with ChildFund PNG's education team
- consider providing the additional equipment requested by health facilities:
 - Kwikila nominated basic needs - thermometer and medical kit bags (similar to those provided to VHV and TB supporters)
 - Bereina health facility nominated test strips for a glucometer - it doesn't make sense to have the glucometer and not the test strips. More consideration may have to be given to the request for a foetal dopler
- consider redesigning IEC material - posters and leaflets - to use fewer words and deliver the messages in Tok Pisen and possibly some in local languages
- consider more education of mothers about the need for children to be fully immunised and possibly the redesign of the baby clinic books so that it is much easier for the mother (and HCW) to identify missing vaccinations, for example, adding a column marked 'complete' for each vaccine. Survey responses indicate that a much higher proportion of mothers think that the child has been fully immunised for their age whereas this is not the case for many children.
- consider the construction of suitable 'lying in' spaces at health facilities to allow mothers whose babies are due to travel to the facility before labour starts – or intensifies – and wait there for the delivery.
 - Bereina has an open air platform adjacent to the facility but no improved latrines
 - Waima has a new building that could be used but needs to be completed and handed over to the facility
- if the Kivori aid post is to be rebuilt in a new location then consider investigating the possibility of building it to the standard of a cyclone shelter, and of sufficient size to protect members of the community

Appendix 1

Health facility equipment list from baseline survey, checked in endline surveys

- Personal Protective Equipment**
- Vaccine Storage Fridge
- Cold Chain Logistics (carriers, cool boxes, icepacks)
- Sphygmomanometer aneroid /blood pressure machine
- Stethoscope
- Adult Scale - Bathroom
- Infant Scale - Salter
- Infant Scale beam
- Height Measuring board
- Weight for height charts
- MUAC strips
- Gestogram
- Foetal scope
- Others