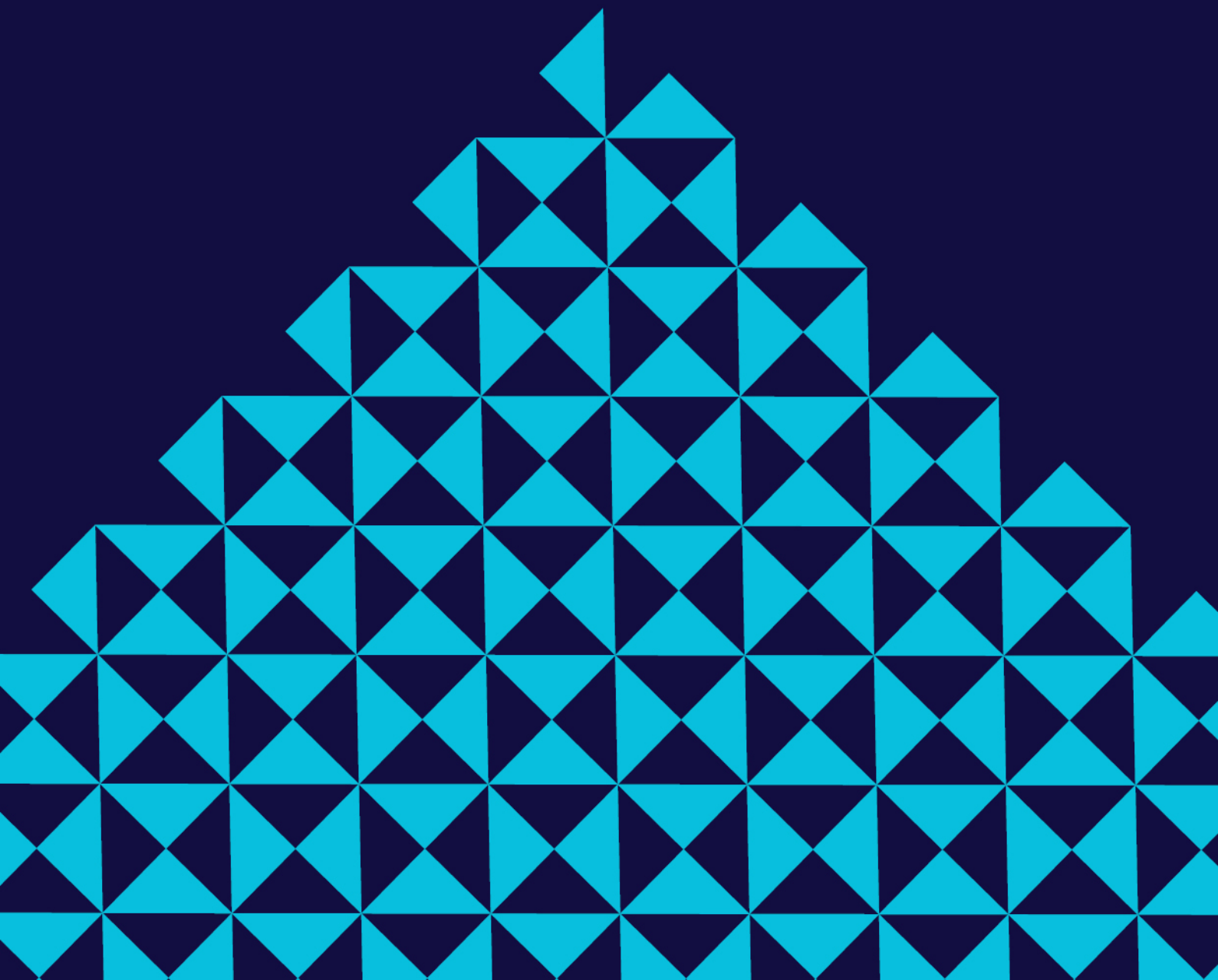
NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Aid Programme

OCTOBER 2019

Evaluation of the Fiji Islands Rheumatic Heart Disease Control and Prevention Activity



STANDARD OF PROOF

Evaluation of the Fiji Islands Rheumatic Heart Disease Control and Prevention Activity

24 October 2019

About us

Standard of Proof was created out of passion. Passion for making a difference, for making the lives of individuals, communities and organisations better. We are specialists in delivering insightful evidence that informs evidence-based and effective activities for our clients to achieve their goals. The evaluation was delivered by Dr Patricia Vermillion Peirce (principal evaluator) and Dr Sira Engelbertz (evaluation and research consultant).

Dr Patricia Vermillion Peirce is a highly experienced evaluator. In the past two decades, Patricia both led and contributed to over 70 different, independent evaluations. She regularly works with clients to identify information needs, engaging in evaluations and purposeful research to identify ways in which services and products can be improved. She specialises in framework development and measurement, and she seeks to ensure data accurately reflect the intended measures. Her work has spanned multiple sectors, primarily in education and health, as well as international development, transport, social development, building and defence sectors. She strives to empower people through data.

Dr Sira Engelbertz is a professional evaluator and social science researcher. Her expertise is in qualitative research, governance and conceptual thinking. She has also developed skills in quantitative methods and data science. Sira has broad work experiences across government, science, creative and business sectors, and is engaged in international networks promotion science education and outreach. She is passionate about informing change and helping organisations succeed through evidence-based and ethical decision-making.

www.standardofproof.nz

Acknowledgements

The Standard of Proof team is grateful to evaluation participants who made themselves available for interviews, many during a busy work-days. These individuals included nurses, physicians, cardiac surgeons, consultants, heads of departments and divisions; as well as the RHD programme team, and wider MHMS, CureKids and FPBS staff, and steering group members. Your expertise, experiences and ideas were invaluable throughout the evaluation. The evaluation team would also like to thank the Project Lead and divisional coordinators, who arranged our visits and accompanied the team to visits, providing invaluable logistical and cultural support.

Photo credit: World Endeavours (https://www.worldendeavors.com), as shared on Creative Commons (CC)

CONTENTS

ABBREVIATIONS AND ACRONYMS

ARF	Acute Rheumatic Fever
Benza	Benzathine penicillin
GAS	Group A Streptococcus
GrASP	Fiji Group A Streptococcal Project
FPBS	Fiji Pharmaceutical & Biomedical Services
MEHA	Fiji Ministry of Education, Heritage and Arts
MFAT	New Zealand Ministry of Foreign Affairs and Trade
MHMS	Fiji Ministry of Health and Medical Services
MO	Medical Officer
NMTC	National Medicines and Therapeutics Committee
PLWRHD	People living with ARF/RHD
RHD	Rheumatic Heart Disease
SG	Steering Group
TAC	Technical Advisory Committee
ToT	Training of Trainers
WHF	World Heart Federation
WHO	World Health Organisation

1. Executive Summary

The Fiji Islands Rheumatic Heart Disease Control and Prevention Project (the Activity) was conducted between 2014 and 2019 with funding from the New Zealand Ministry of Foreign Affairs and Trade (MFAT), Cure Kids and the Fiji Ministry of Health and Medical Services (MHMS) under the New Zealand Partnerships for International Development Fund programme. The Activity sought to facilitate co-ordination of all acute rheumatic fever (ARF)/rheumatic heart disease (RHD) activities aimed at creating sustainable and effective ARF/RHD control in Fiji. To this end, activities focused on a collection of key outputs: a national register-based secondary prevention programme (Output 1), best practice guidelines for the clinical care of patients with ARF/RHD (Output 2), a model for RHD early case detection (Output 3), health promotion (Output 4) and primary prevention guidelines (Output 5).

The evaluation of the Activity served an accountability and learning purpose. The evaluation assesses the outputs against the established criteria of relevance, effectiveness, sustainability and impact, and answers three key evaluation questions: (1) '*To what extent was the planned Activity delivered and achieved its intended aims?'*; (2) '*How has the Activity strengthened the health system to manage and control rheumatic fever and rheumatic heart disease*?'; and (3) '*How well placed is Fiji to continue the delivery of the Activity?* '. The evaluation was carried out over 11 weeks and included a review of 80+ documents and literature, 35 individual or small group interviews with 46 participants, observations at 11 health facilities, and two sense-making sessions (18 participants).

Findings

The evaluation found that the Activity was worthwhile in delivering activities that work towards reducing ARF/RHD morbidity and mortality in Fiji. In sum, the Activity was relevant to Fiji's context and needs, meeting or exceeding expectations in terms of alignment to existing health systems, processes, practices and people. Overall, the Activity was also effective in achieving what it set out to achieve. However, it's greatest (weighted) achievement was evidenced in sustainability, which was believed due, in large part, to the inclusive partnership approach taken with the Fiji government and the prioritised activities promoting local commitment and ownership to the Activity from the outset. Impact was also achieved, demonstrating some broad benefits for the Fiji health system and population.

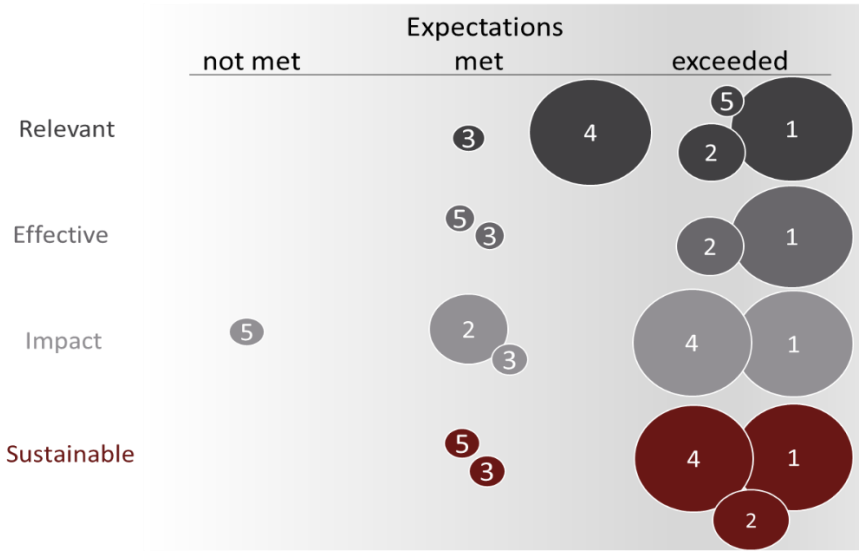


Figure 1: Overall performance of the Activity according to the four criteria (relevant, effective, impact and sustainable) and across all outputs ("1" refers to the national register-based secondary prevention programme; "2" refers to the best practice guidelines for the clinical care of patients with ARF/RHD; "3" refers to the model for RHD early case detection; "4" refers to the health promotion activities; "5" refers to the primary prevention guidelines).

As shown, each output contributed to this overall assessment of the Activity differently, and the weighted contributions represent the perceived value of each output towards reducing ARF/RHD morbidity and mortality in Fiji. The findings for each output are summarised below.

1. The **register-based programme** ('high value') aligned with the local health systems and processes and integrated into existing services well. Solutions were put into place where web-based services were not available, and support groups provided extra care (relevance). The expected outcomes were achieved, with opportunity to further expand (effectiveness). There is a clear commitment and expectation that the work undertaken under the Activity will continue across all tiers of service, with staff secured to support this (sustainability). There are significant broad benefits for Fiji in its ability to predict health practitioner capacity requirements as well as demand for Benzathine penicillin, or "Benza" (impact).
2. **Best practice guidelines** for the clinical care of patients with ARF/RHD ('mid-value') were clear and accessible to health practitioners irrespective of contextual factors that may have limited access and use (relevance). Practitioners have been trained on the content (with further training planned), and clear and consistent demonstrations of changes were made in the guidelines (effectiveness). There is clear demonstration and commitment to sustain workforce capacity (sustainability). The guidelines will likely enable significant and broad benefits for Fiji insofar as standardising the care and management of ARF and RHD (impact).
3. A **new model for early detection of ARF and RHD cases** was implemented, focusing on echocardiography (echo) screening ('low-value'). While the development and output aligned with the needs, significant gaps remain in terms of overall system capacity to adequately support the Fiji population (relevance). The expected outputs and outcomes were achieved, with demonstrated improved capacity to carry out screening and enable early diagnosis (effectiveness). The data demonstrate the expected increase of children being diagnosed with RHD, and therefore the success of this Activity within the pilot population (impact). There is also a clear commitment and expectation that the echo screening programme will continue, albeit the funding is not confirmed at this stage (sustainability).
4. **Health promotion** ('high-value'), specifically a national multi-media campaign for Benza promotion and rheumatic fever awareness raising were implemented, education and communication material produced and disseminated, and support groups for people living with RHD and carers convened. Expected outputs were delivered, but there is currently insufficient evidence to demonstrate increased knowledge in health literacy (effectiveness). Examples are provided of the benefits achieved from the health promotion, but these are anecdotal at this stage (impact), while there is a clear expectation that the health promotion will continue across all tiers of service (sustainability).
5. **Primary prevention guidelines** were developed as the Fiji Sore Throat and Skin Disease Diagnosis and Treatment Guidelines ('low-value'). Some evidence were lacking given the relatively recent release of these guidelines. Where evidence was available, the output met expectations insofar as these demonstrated that this output was relevant to the Fiji context (relevance). Guidelines were delivered with plans to train current health practitioners (effectiveness). However, there were no detectable benefits for the Fiji population to date (impact). Sustainability of the guidelines was expected, given the planned training and the availability of the guidelines (sustainability).

Recommendations

Twenty-four recommendations are made to further enhance and sustain the work undertaken during the life of the Activity, building upon the developed outputs and achievements across the Activity. These are provided to the Activity Governance Group to consider as part of the broader work programme and MHMS activities, as well as in light of the broader potential impact of increased demand for service on the health system and the subsequent ability for the overall health system to cope with such demand.

2. BACKGROUND

This section provides contextual information about the rheumatic heart disease control and prevention project, and the support provided under the contract with Cure Kids. It also includes the purpose of the current evaluation of the Activity, its associated methodology, and an overview of the structure of this report.

2.1 The Activity

Rheumatic Heart Disease is a significant health problem in Fiji.

Rheumatic heart disease (RHD) is a serious heart condition that can occur following an episode of acute rheumatic fever (ARF). Rheumatic fever is thought to occur when the body produces an autoimmune response to a throat infection caused by a Group A Streptococcus (strep throat or GAS infection). In some cases, an untreated sore throat can cause the body's defence mechanism to react, causing inflammation of the heart, joints, brain and skin. In some cases, this inflammation of the heart can cause scarring of the heart valves known as RHD, a chronic non-communicable disease that causes significant morbidity and disability through childhood and into early adulthood. Without preventive antibiotics, people who have had ARF can have repeated attacks that cause damage or further damage to their heart valves, leading to heart failure and premature death.

RHD is a significant health problem in Fiji, with the Pacific region having the highest reported prevalence of RHD in the world. The echocardiography confirmed prevalence of RHD in children aged 5-14 years in Fiji is 19.2 per 1000[1], which means there is approximately one child in every classroom with RHD. Often children come to clinical services late with already symptomatic RHD. The data currently available shows that at least 60 people die from RHD each year, with the average age at death being 38[2]. Young indigenous Fijian (iTaukei) men with RHD have been found to be at increased risk of death (50 times higher) compared to the general population.[3]

The Activity was developed to extend on previous RHD efforts in Fiji.

Evidence from New Zealand shows that early diagnosis of ARF and RHD in its mildest form, and an effective secondary prevention programme to prevent recurrences of ARF, will contribute to reducing RHD mortality and morbidity as well as act as an enabler for economic growth.[4] RHD control and prevention is a national priority for Fiji. The Fiji Ministry of Health and Medical Services (MHMS) launched the Fiji ARF and RHD policy in 2015 and RHD control and prevention is incorporated in the MHMS current strategic plan.[5]

The first coordinated activities to reduce ARF and RHD in Fiji began with the establishment of the Fiji RHD control and prevention programme in 2005. The programme was supported by the World Heart Federation (WHF) and the Pacific RHD programme in collaboration with the Fiji MHMS. In addition, the programme received support from the Fiji Group A Streptococcal Project (Fiji GrASP) through epidemiological, clinical and operation research. The programme focused on capacity building with key planned activities.

With the intention of extending and strengthening this Fiji RHD programme, the *Fiji Islands Rheumatic Heart Disease Control and Prevention programme* (further referred to as the Activity) was conducted between 2014 and 2019 with funding from the New Zealand Ministry of Foreign Affairs and Trade (MFAT), Cure Kids and Fiji MHMS under the New Zealand Partnerships for International Development Fund programme. The Activity cost

---

[1] Colquhoun S, Kado J, Remenyi B, Wilson N, Carapetis J, Steer A. (2014). Echocardiographic screening in a resource poor setting: Borderline rheumatic heart disease could be a normal variant. International Journal of Cardiology 2014; 173:284-289.

[2] Singh P, Carapetis J, Buadromo E, Samberkar P, Steer A. (2007). The high burden of rheumatic heart disease found on autopsy in Fiji. Cardiol Young, 2007; 18:62-69.

[3] Situational Report (2014) & Programme Design Document (2014); primary source: Parks et al. (2015). Rheumatic Heart Disease-Attributable Mortality at Ages 5–69 Years in Fiji: A Five-Year, National, Population-Based Record-Linkage Cohort Study. PLOS Neglected Tropical Diseases, 9(9), e0004033. https://doi.org/10.1371/journal.pntd.0004033

[4] Hughes et al. (2011). Projections of global health outcomes from 2005 to 2060 using the International Futures integrated forecasting model. Bulletin of the World Health Organization, 89(7), 478–486. https://doi.org/10.2471/BLT.10.083766.

[5] Ministry of Health & Medical Services. (2016). National Strategic Plan 2016-2020, Executive Version. Suva, Fiji.

NZ$3,109,564 over the funded period, of which NZ$2,238,886 was funded by MFAT[6]. The overall cost was small when considering the economic impact of excess mortality from RHD, which was estimated to cost Fiji $6,077,431 (US$) annually.[7]

MHMS has been the local lead, with Cure Kids New Zealand the overall Activity lead, and the Auckland District Health Board (ADHB) and Fiji GrASP as technical advisory partners. The Activity sought to facilitate the co-ordination of all ARF/RHD activities, the integration into existing RHD control services and models of care, and the development of new models of care, with the aim of creating sustainable and effective ARF/RHD control in Fiji. Building upon the work and experiences of the Fiji RHD programme[8] prior to the Activity, specific pillars of best practice for effective ARF/RHD control in Fiji could be identified, which are the focus of the Activity's key outputs.

- **Output 1:** A **national register-based secondary prevention programme** (herein, 'register-based programme') with an associated quality improvement process, including the rheumatic fever information system (RFIS).
- **Output 2:** Best practice **guidelines** for the clinical care of patients with ARF/RHD.
- **Output 3:** A model for **RHD early case detection**, including a national echo screening programme.
- **Outputs 4 and 5: Health promotion strategy** and **ARF primary prevention** (respectively)

Each of these outputs included several associated activities aimed at developing/adapting and implementing them for the Fijian context. Activities have been specifically targeting those at the highest risk of rheumatic fever, among whom the burden of RHD is greatest.

The Activity was expected to contribute to reduced ARF/RHD morbidity and mortality in Fiji.

It is expected that both the register-based programme and the guidelines would support effective ARF/RHD diagnosis and management, including improved delivery of, and adherence to, antibiotic prophylaxis. An improved and expanded case detection programme would be supported through the development and piloting of RHD early case detection in schools, while public awareness and health literacy would be enabled through the prevention and health promotion strategy. Collectively, and over the longer period (beyond the scope of this Activity and evaluation), these outcomes are expected to reduce ARF/RHD morbidity and mortality through reducing ARF incidence and RHD prevalence. This series of outcomes is shown in the Activity results framework[9] below (Figure 2).

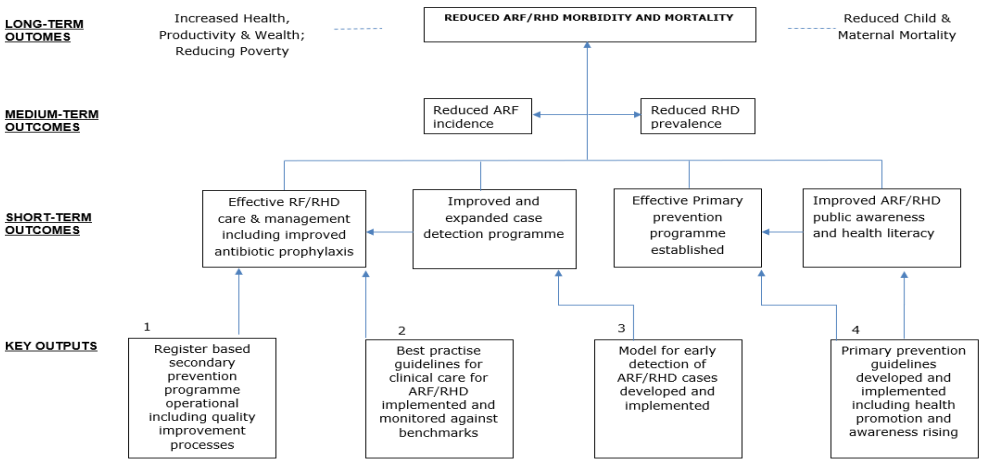


Figure 2: Results framework for the Rheumatic Heart Disease Prevention and Control Programme (the "Activity")

---

[6] Activity Design Document (2014)

[7] Parks et al. (2015). *Rheumatic Heart Disease-Attributable Mortality at Ages 5–69 Years in Fiji: A Five-Year, National, Population-Based Record-Linkage Cohort Study*, https://doi.org/10.1371/journal.pntd.0004033.

[8] For instance, MHMS funded a senior nurse to act in the role of National RHD Coordinator from 2013 to 2017, which provided significant contributions to the RHD Policy and delivery of nurse training prior to the commencement of the Activity.

[9] Activity Design Document (2014, pg. 27)

2.2. The Evaluation

The evaluation served a learning and accountability purpose.

The evaluation of the Activity was commissioned to understand the success of the funded activities and resulting outputs and outcomes, demonstrating to the funders (MFAT, Cure Kids and MHMS) and implementation partners (Fiji MHMS, Cure Kids and Fiji GrASP/Murdoch Children's Research Institute) and technical advisory partner (ADHB, staff from Counties Manukau District Health Board) what has been achieved. The evaluation therefore serves an accountability purpose.

The evaluation also serves a learning purpose. As the Activity is coming to an end, core resources relevant to the continuation of the activities and output costs will be transitioned to the Fiji Government[10], and therefore the results will be used to inform future resourcing and activities. The evaluation will therefore help these decision-makers to make informed and evidence-based decisions. This will be crucial in considering the next steps for the five outputs towards reducing rates of ARF/RHD and improving diagnosis and management practices for people living with ARF/RHD (PLWRHD) in Fiji. The structure of the report, alongside the rubric, focused on this learning purpose, and setting out achievements and evaluative judgements according to five outputs (c.f. Appendix 4).

The evaluation focussed on the relevance, effectiveness, impact and sustainability

The evaluation examined the management and delivery of the key outputs from 2014 to mid-2019, including the development of systems and human resource capacity across the Fiji health system that were intended to enable these outputs. The evaluation focussed on assessing each of the Activity outputs against four identified criteria of success:

- **Relevance:** how well the outputs and associated activities have aligned to in-country systems and processes
- **Effectiveness:** to what extent the outputs were delivered and achieved the intended short-term outcomes
- **Sustainability:** how likely the approach and benefits of each output will continue beyond the planned "transition-out" strategy
- **Impact**: progress towards reduced incidences ARF/RHD and improved clinical care, and the broader benefits for the population of Fiji (not attributional claims of the Activity towards these achievements).

Efficiency was considered and agreed outside of scope for the current evaluation.

3. EVALUATION METHODOLOGY

The evaluation addressed three key questions.

The approach was guided by the intended users and uses, and answering the following evaluation questions:

1. To what extent was the planned Activity delivered and achieved its intended aims (Relevance and Effectiveness)?

a. What progress has been made in delivering the outputs?

b. To what extent has the Activity, through each of the outputs and associated activities, achieved the intended outcomes?

c. What other factors are enhancing or constraining?

2. How has the Activity strengthened the health system to manage and control rheumatic fever and rheumatic heart disease (Impact)?

a. How has the Activity built capability and a sense of community among health professionals?

b. To what extent has the Activity built the capacity of the health system and provided models of delivery and products to support the management and control of rheumatic fever and rheumatic heart disease?

[10] Programme Design Document (2014, pg. 27)

c. If any, what were the secondary outcomes of the Activity that may not have been anticipated?

3**. How well placed is Fiji to continue the delivery of the Activity (Sustainability)?**

a. How well placed are the local systems and capacity of the Fiji RHD Control Activity to sustain the delivery of the Activity?

The evaluation looked to answer these questions, and assess each of the outputs against the expected achievements identified during the evaluation planning phase.

The evaluation team collected, collated and triangulated data across a variety of sources.

The evaluation[11] was carried out over several stages. The first sought to understand the context and design of the Activity, using secondary data and documents provided by the RHD programme team. Next, data collection and collation was undertaken, including in-country engagements in Fiji with a range of key stakeholders and health practitioners (2 weeks). The interviews identified a range of secondary data sources, which were compiled throughout the data capture period; although the evaluation did not include a literature review, these secondary data sources (often published literature) were considered as demonstrations of evidence supporting individuals' views and perceptions. At the end of this stage, an in-country sense-making workshop with health practitioners and MHMS staff took place, validating the findings alongside promoting use of the evidence. A second sense-making session was undertaken with the management of the Activity in New Zealand, sharing emerging findings while identifying information gaps. Finally, the evidence was analysed for themes, and synthesised according to the 5 outputs and criteria. The report was then drafted and finalised after feedback from the RHD Activity steering group, Cure Kids and MFAT.

Data has been triangulated and sources coded (e.g. 'DOC', 'ST', 'HP' or 'SS') throughout the report to demonstrate the weight of the evidence for the reader; the (anonymised) source codes highlight the types and numbers of evidence supporting the findings throughout the report. The evaluation evidence included:

- Documents (**DOC)** produced for or relevant to the Activity (e.g. design, planning, manuals, training reports, Fiji MHMS documents), n = 83 documents.
- Stakeholder interviews (**ST**) with New Zealand and Fiji stakeholders (e.g. Project Lead and partners, funders, Fiji government officials and volunteers), n = 19 engagements with 23 stakeholders.
- Health practitioner interviews and observations **(HP)** in Fiji (e.g. nurses, doctors, surgeons, sonographers) in Suva, Nadi, Ba, Lautoka, Lodoni, Labasa, Savusavu, n = 16 engagements with 23 health practitioners.
- Sense-making sessions (**SS**), n = 2 engagements with 18 stakeholders and health practitioners.
- Analyses of datasets (e.g. RFIS downloaded in July 2019, FPBS provided in July 2019), n = 2.

These codes are aggregated and/or suppressed to ensure anonymity, where deemed appropriate.

To assess the performance of the Activity, each output was given a weighting, and this weighting estimated the perceived value of each output towards reducing ARF/RHD morbidity and mortality in Fiji. Prior to the evaluation commencing data collection, the Steering Group assigned the weighted values:

- high value, which included the register-based programme (Output 1) and health promotion activities (Output 4)
- medium value, which included the best practice guidelines (Output 2)
- low value, which included the early case detection programme (Output 3) and primary prevention guidelines (Output 5).

Strengths and limitations: Although data and time were limited in some cases, the evidence serves as a strong foundation demonstrating the achievements and progress made by the Activity.

The evaluation team made use of multiple data collectors to test and validate perceptions throughout data collection. Demonstrations and perceptions formed a large part of the evidence, and as such, the team focussed on triangulating these across multiple sources. Where perceptions were the only data available, this

[11] Ethics approval to undertake the evaluation was approved on 25 July 2019, granted by the Fiji National Health Research Ethics Review Committee (Approval ID: 2019.81.NW).

is made clear in the report. The report makes clear the weight of the evidence that supports the claims, both qualitative and quantitative, so that the reader may estimate the value of any claims independently.

It should be noted that the general business of those interviewed meant interruptions during interviews occurred (particularly when in health facilities), and oftentimes interviews were truncated due to limited availability and/or capacity. It was necessary to focus these interviews on the key, high-level questions and allow interviewees to guide the focus of the interview towards their area of greatest knowledge and experience. Nevertheless, the evaluation team was satisfied that saturation was occurring in the data, that evidence is reflective of the Activity, and the report makes clear wherever data was limited.

A main limitation for the evaluation was the limited secured capacity in relation to the size of the Activity[12], and the short timeframe (11 weeks) to developing and then gaining agreement on the evaluation plan to collecting and analysing data and drafting the full report. The timeframe was particularly challenging given the breadth of the diverse outputs working across the health system. The timeframe and overall budget meant limited opportunities to collate and analyse data, and the result was as follows:

- The evaluation did not include a literature review on rheumatic heart disease. However, when key pieces of research were noted by stakeholders and health practitioners, these were sourced and included as relevant contextual documents.
- Data reflect sites located around or near the main centres of Nadi, Suva and Labasa rather than those locations that have the greatest potential barriers to service (distance).
- Data reflect focused engagements with the developers and users of RFIS, the guidelines and echo screening programme, rather than the target audiences of the health promotion or the recipients of the services (i.e. PLWRHD), their families and communities.
- Not all documents were able to be obtained within the timeframe, and some key documents (such as the report of the knowledge, awareness and practices 'KAP' questionnaire, and the RFIS audit report) were not available at the time of this report.
- The recommendations reflect the findings captured and collated by an evaluation team (not ARF/RHD experts) during a short timeframe. The recommendations are therefore limited in their potential scope, and were developed specifically for the Activity Governance Group (made up of technical and contextual experts) to consider within the context of the Fiji health system and as part of the broader RHD activities currently underway.

[12] Evaluation budget was less than 1% of the Activity funding.

4. FINDINGS

This section discusses the value of the Activity through the evidence collated as part of the evaluation. In agreement with the RHD programme team, we have synthesised the evidence according to the five outputs to promote use of the evaluation findings for MHMS moving forward. Each section sets out the evidence in terms of:

- The **relevance** and **effectiveness** of each output, setting out the key achievements in terms of outputs and outcomes (KEQ1).
- The **impact** of the outputs on Fiji, and how the outputs have strengthened the health system (KEQ2) benefiting of the Fiji population.
- The **sustainability** of the output, and how well-placed Fiji is to continue delivering the outputs (KEQ3).
- The activities and contextual factors that hinder and support success, and key considerations for MHMS moving forward.

4.1. Output 1: Register-based secondary prevention programme

The overall performance of the register-based programmes is shown below. The section following provides the overview of evidence supporting this assessment.

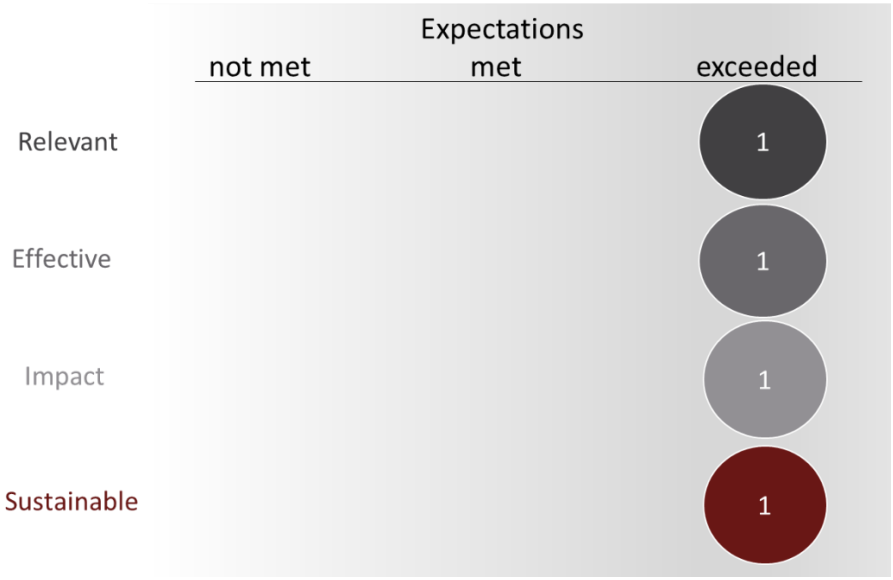


Figure 3: Overall performance of the register-based programme (weighted as a 'high value' output)

4.1.1. Output 1 exceeded expectations in terms of relevance, aligning with the local health systems and processes, and integrating across all tiers of service.

The register-based programme included developing systems and improving overall capacity towards secondary prophylaxis adherence. For example, the activities included:

- System development, such as the information system designed to support the clinical care and management of ARF/RHD (RFIS, see below).
- Capacity development, such as divisional coordinators working with health practitioners across the four regions to support data management and reporting used for *'tracing'*[13] patients, education and training (outputs 2 and 5), health promotion (c.f. output 4) (HP06, HP13, ST01, ST04, ST09).
- Awareness raising activities, such as multi-media campaigns targeting PLWRHD and carers in order to bring back those patients that are non-compliant to treatment – "defaulters" (DOC8C,

[13] Tracing is an activity whereby health practitioners contact PLWRHD to remind them of their treatment and encourage visiting health facilities and adherence.

DOC8D); and text messaging (ST02, ST13).

- Patient support groups, to address the knowledge gaps among patients and carers, and reduce the stigma associated with RHD (ST03, ST04, ST13).
- Phone credit to RHD liaison nurses[14] (HP01, HP06, ST13).

The intention of the information system 'RFIS' was to have a centralised national register embedded in the Ministry's existing IT infrastructure 'PATIS' (DOC22, DOC23, DOC24). It was developed in collaboration with the MHMS Health Information Unit (ST02, ST04, ST12) along with a RFIS working group and a web-developer (DOC8A, DOC8B, DOC27). This was the first disease register to be integrated into PATIS (DOC24), and it required careful management with regards to design and security, navigating the approval process necessary to successfully integrate the systems (DOC22, DOC24, ST02, ST04). Nevertheless, an integrated system would be able to exchange patient information (rather than duplicating patient level information) and could be used by anyone already using PATIS (DOC22, ST04, ST12).

Interviews and observations showed that larger facilities, or some health centres with computers, had access to RFIS (HP02, HP03, HP06, HP08, HP13, HP14, ST02) whereas other smaller facilities, with limited internet connectivity and/or a lack of computers, did not (ST01, ST04, ST07, HP01, HP05, HPR09). RFIS data, coupled with information from the RHD programme team, demonstrated that all health facilities with 50 or more RHD patients had access to the web-based register, while one subdivisional hospital (Lomaloma) did not yet have access to the web-based information system.

Table 1: Numbers of health facilities with RHD patients in Fiji, and in brackets the percentage of these facilitates with access to RFIS (lists of facilities confirmed by the MHMS office, July & September 2019)

Numbers of RFIS documented RHD patients	Divisional hospital	Subdivisional hospital	Health centre	Nursing station	% of facilities with access to RFIS
100-429 RHD patients	3 (100%)	2 (100%)	6 (100%)		100%
50-99 RHD patients		2 (100%)	4 (100%)		100%
20-49 RHD patients		8 (88%)	7 (29%)	1 (0%)	56%

Although not everyone has access or enters data directly into RFIS[15], it was clear the register (including the manual registers) was being used by government organisation staff, management and health practitioners alike, who were using the register to:

- Support the routine assessment and surveillance of ARF/ RHD patients and recording prophylaxis delivery (HP01, HP02, HP03, HP05, HP06, HP08, HP09, HP13, HP14).
- Estimate adherence and achievements according to "the percentage of RHD patients adhering to 80% of their injections" (HP03, HP04, HP06, HP11, ST02, ST01, ST04, ST11).
- Estimate capacity requirements to recall patients who are due for, or missed doses of Benza (HP01, HP02, HP06).
- Providing epidemiological data to estimate the burden of ARF and RHD in Fiji, and estimate Benza demand and secure supply for RHD patients in Fiji (ST02, ST01, ST04, HP06, ST11).

4.1.2. Output 1 exceeded expectations in terms of effectiveness, demonstrating widespread use and uptake among health practitioners, improved quality of data and improved adherence rates among RHD patients.

RFIS was launched in July 2016 (DOC8B), and since then, divisional coordinators and health practitioners have been adding new RHD cases into RFIS when they are confirmed while retrospectively adding existing PLWRHD (ST01, ST02, ST04, ST09). Figure 4 below demonstrates RHD notifications doubling each year since RFIS was

[14] Phone credits were reportedly discontinued during the Activity.

[15] Programme staff reported that 17 facilities are entering data directly into RFIS.

launched. What is further notable is that these notifications are largely retrospective, with more than half of the RHD notifications were diagnosed more than one year prior this notification. As shown below, 57% or more of RHD notifications made since 2016/17 were RHD cases diagnosed more than a year earlier.

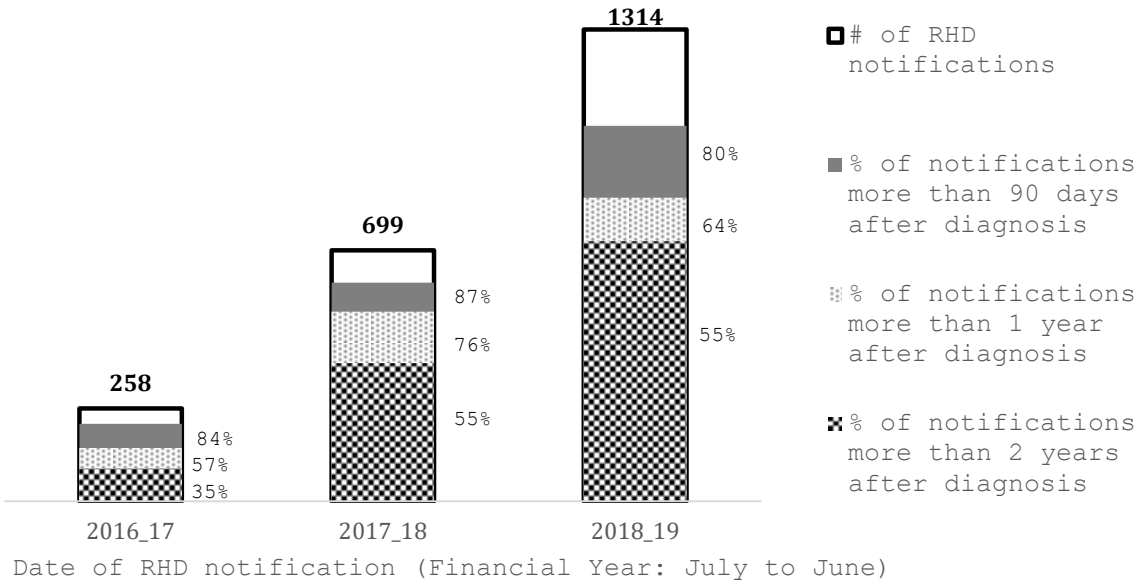


Figure 4: Cumulative % of suspected and confirmed RHD notifications (RFIS data, extracted July 2019)

Figure 4 also demonstrates that RFIS data are increasingly representative of more recent diagnoses. As shown (non-shaded bar), 16% (in 2016/17) and 13% (in 2017/18) of RHD notifications were diagnosed within 90 days of the notification, whereas 20% of RHD notifications were RHD cases diagnosed within the previous 90 days in 2018/19.

Not only is data becoming more up-to-date, but adherence rates appear to be improving. Prior to the Activity, it was also recognised that adherence rates were ineffectively low (DOC3, ST01, ST02, ST04, ST09). One study conducted prior to the Activity estimated 7% were meeting adequate levels of adherence[16]. Since the launch of RFIS in 2016, improved overall adherence rates were noted in reporting documents (DOC8B, DOC8C), among health professionals (HP14, HP08, HP09, HP11) and in a recent analysis of RFIS data. Specifically, data showed an increase in adherence rates over time across all four regions, with some regions increasing at a greater rate than others. Although these rates are not yet meeting the initial target (i.e. 80% of RHD patients receiving 80% of scheduled injections), the target was believed to be beyond what could be expected and aspirational when considering the baseline adherence rate of 7% (ST15, ST19).

[16] Engelman et al. (2016). *Adherence to secondary antibiotics prophylaxis for patients with rheumatic heart disease diagnosed through screening in Fiji*, Trop Med Int Health 2016 Dec: 21(12): 1583-1591.

Table 2: Secondary prophylaxis adherence rates demonstrating clinically 'acceptable' adherence rates of >80% (provided by the RHD project team, July 2019)

	1 July 2016 to 30 June 2017	1 July 2017 to 30 June 2018	1 July 2018 to 30 April 2019
Central & East	25%	30%	41%
North	39%	37%	45%
West	40%	47%	58%

Stakeholders and health practitioners were consistently able to exemplify how the register-based programme contributed to these improved adherence rates. For instance, divisional coordinators' reporting, and visits and contacts with health practitioners, were believed to promote prioritised efforts towards secondary prophylaxis adherence (HP01, HP03, HP12, ST13). The data above also support this claim, showing the region with the longest sustained support from a divisional coordinator (West) with the highest secondary prophylaxis adherence rates among the regions. Patient support groups were also believed to contribute to higher adherence rates (DOC25, HP07, HP15, HP16, ST01, ST03, ST08). The importance of the community groups was emphasised by a number of interviewed health practitioners. Just as noted in Section 4.1, education, in particular through the support groups, were considered necessary to reduce the stigma and shame associated with RHD in Fiji (HP12, HP16, ST03), and to ensure a supportive environment for patients leading to greater adherence to their treatment. Many interviewees pointed out support groups were crucial for RHD patients (HP07, HP15, HP16, ST01, ST03, ST08), including peer support groups, parent initiatives and groups led by NGOs.

Further, RFIS provides evidence to monitor and promote prioritised practitioner efforts towards adherence (HP01, ST04, ST05). Some participants noted that follow ups with individuals did not occur before RFIS and now the nurses are spending time to trace patients and encourage them to come in for their injections (HP01, HP02, HP11, HP14). They were tracing the defaulters by phone as well as visiting them at home to try to ensure patients received their injections (HP05, HP17, HP14). RFIS data also allowed management to plan for the capacity required to trace patients (HP02, HP04), resulting in fewer defaulters. Only one person, not yet using RFIS, suggested that tracing was already part of their community engagement practice.

Over time, adherence to secondary prophylaxis is expected to reduce morbidity and mortality related to RHD. Although viewed as an aspirational target within the timeframe, initial estimates suggest these rates are improving. Research conducted on RHD related deaths between 2008 and 2012 estimated a crude RHD mortality rate of 9.9 per 100,000[17]. Documents based on an analysis of RFIS data (2017) suggested that RHD related deaths may be decreasing, with a crude RHD mortality rate reported as 5.0 per 100,000 (DOC8D). Given the inability to estimate RFIS error rates, this estimate would require further verification.

4.1.3. Output 1 exceeded expectations in terms of impact, with significant positive benefits being realised for the health system to manage and control ARF and RHD, and PLWRHD population in Fiji.

The register-based programme was observed across all tiers of the health service. Interviews with stakeholders and health practitioners reinforced the benefit of the register-based programme for strengthening the health system (HP02, HP03, HP06, HP12, HP14, HP16, ST02, ST01, ST04, HP06, ST11, ST13), as:

- The data sharing between divisional coordinators, health facilities and the MHMS were perceived as strengthening the monitoring of RHD, resulting in a prioritisation towards secondary prevention.
- The work between the divisional coordinators and health facilities to understand RHD and RFIS data was viewed as improving the greater understanding of RHD and how to manage this.
- The reports help management understand the numbers of diagnosed RHD patients, monitor success according to adherence rates, and estimate capacity demands on the health centre "*Tells me if she needs to go out and visit patients"* (health practitioner).

[17] Parks et al. (2015). *Rheumatic Heart Disease-Attributable Mortality at Ages 5–69 Years in Fiji: A Five-Year, National, Population-Based Record-Linkage Cohort Study*, https://doi.org/10.1371/journal.pntd.0004033.

- The understanding of prevalence raises awareness across the health sector, bringing RHD into the spotlight.
- Greater awareness and understanding have resulted in more people reportedly showing up in hospitals and clinics asking for ARF check-ups and treatment (also relevant to output 4 – awareness raising campaign).
- PLWRHD / RHD champions telling their own RHD stories was noted as helping to bring more awareness to people while reducing the stigma and shame associated with RHD and to ensure a supporting environment for patients.

Further reports suggest that Benza supply is now being managed specifically for PLWRHD in Fiji. As explained by a stakeholder, the Activity worked within the Fijian government health system, including the Fiji Pharmaceutical and Bio-medical Services (FPBS), to ensure Benzathine penicillin was recognised and approved for RHD patients, and on the *approved essential medicines list* in Fiji. Because of this effort, budget is secured to ensure Benza suppliers meet the needs of all of Fiji's RHD patients, now and over time.

Describing prevalence of RHD, such as RFIS does, helps estimate demand and enable the Government to secure the required medication in advance. Several interviewees reflected upon a "Benza shortage" several years prior to the Activity, now noting there is adequate supply available – "it seems to have been sorted" (HP01, HP03, HP04, HP09, HP12, HP15, HP16, HP17, ST01) or lack of supply is infrequent (ST05, HP11, HP14) or manageable (HP08).

4.1.4. Output 1 exceeded expectations in terms of sustainability, demonstrating commitment and broad expectations across all tiers of service. It is well placed to continue delivery of register-based programme, but capacity remains the risk if the intent is to expand RFIS.

Stakeholders and health practitioners agreed that RFIS would continue being used with continued training and further support where required (HP02, HP03, HP07, HP11, HP13, ST01, ST02). It was further expected from some that RFIS would be made available to even more people, moving practitioners from paper-based registers to a purely digital source of information (HP02, ST05), and further changes would be made to the web-based portal to enable greater use (ST04, ST05, HP11). This widely held expectation promotes the continued use and further demand for the web-based service.

Over the four years of the Activity, the development and management of the register-based programme accounted for approximately $146,000 (on average) of the MFAT-funded budget for each year of delivery (DOC8A, DOC8B, DOC8C, DOC8D). Current capacity will likely be able to maintain the current system and activities. Documents highlighted the availability of RHD liaison nurses, noting that there are now RHD nurses in all subdivisions who are specifically assigned to RHD patients and responsible for maintaining the register and reporting on secondary prophylaxis adherence (DOC55). Further, four MHMS positions have been secured specifically for RHD. Three of the four positions have been filled (divisional coordinators), and these are expected to continue to maintain and manage the register-based programme over the next five years (confirmed contract periods), working with health practitioners to enter and report ARF/RHD data, and also providing reports to regional facilities, including management staff, on adherence. These activities and capabilities are key for maintaining the current delivery of RFIS in the regions by entering data where this is not possible onsite and reporting. However, there remains risk to the sustainability of the programme given not all capabilities are available moving forward (see below).

4.1.5. Further considerations for the register-based programme moving forward

Collaboration, specialist knowledge and capabilities were seen as key enablers to the effective and integrated information management system. Nevertheless, some barriers hinder the further success of the register-based programme. These are:

1. **Lack of trust in and use of data**: Trust was believed to limit use and uptake of RFIS. Participants reported that RFIS data does not yet accurately reflect on the ground experiences in terms of patients assigned to specific facilities or adherence rates (HP14, HP06, HP08, HP09, HP13, HP14). The reports may reflect inaccurate data, but they may also reflect the different indicators; specifically, longitudinal, quarterly statistics (i.e. % of patients receiving 80% of their injections)

may differ significantly from monthly adherence rates (i.e. % of patients receiving their scheduled treatment).

2. **Accuracy and recency of data**: Accuracy is expected to continue as RFIS matures (ST04, ST07, ST01) and individuals adapt their data management practices. Multiple data sources – RFIS, register books, patient register books - are likely contributing to data discrepancies (ST02, ST04, ST08, HP12, HP13), and having inaccuracy data is contributing to the overall time required for tracing patients.
3. **Limited reporting function and utility**: Divisional coordinators download lists of data, and then "correct" duplicate patient cases manually and provide lists of patients to health practitioners so they can 'check' their data (HP06, ST01, ST04). Reports are also provided quarterly as estimates of adherence rates.
4. **Constrained capacity**
    a. **for system development:** Although MHMS has IT capability, it was reported by several stakeholders that there is limited capacity to undertake further changes. If further developments to RFIS are required, or access is expanded, further capacity will likely be required.
    b. **for data entry and reporting:** the multiple data sources were meaning practitioners were having to enter the same data into various source documents, taking up valuable time.
    c. **for tracing:** Although the benefits to tracing was widely recognised, the task of contacting patients requires a significant amount of time among those managing large numbers of patients (HP01, HP02, HP06). Capacity is further strained if contact information and/or secondary prophylaxis are not up-to-date. Conversely, having fewer patients enables easier tracing, as does having additional support (e.g. community health workers and zone nurses) and phone cards to contact patients.
    d. **for management:** not all the requisite capabilities are secured. For instance, the capacity to manage the central dataset, which is currently under the position description of data manager (DOC28, ST01, ST04), is not secured, and while MHMS funding for the National Co-ordinator role is secured, there have been ongoing delays in recruitment with the role currently vacant. The former position coordinates the health data collection system, cleans and analyses data and evaluates the integrity of the data. They communicate the results as well as train staff on how to clean data and use key software functions for reporting. The later position coordinates all efforts.
5. **Unreliable supply chain**: It is understood that when Benza supplies are short, international prices may fluctuate and supply may not be available or affordable. Finding additional funds from fixed budgets was noted as challenging.

It's useful to note that divisional coordinators have been working with health facilities to identify and correct errors in RFIS, and the RHD programme team adjusted how they calculate adherence rates to only include those patients who received at least one injections in the last two years (i.e. 'active patients'), and exclude those long-term defaulters (who are lost in the system). The evidence suggests further actions may benefit the Activity. These recommendations are listed below for the Steering Group to consider as part of the broader RHD work programme.

Table 3: Recommendations to enhance achievement from the register-based programme

Findings	Recommendation
Constrained capacity; Accuracy and recency of data	1. Make RFIS available to more health facilities, first focusing on those facilities with internet connectivity and computers, and then planning for greater roll out. 2. Transition practitioners to record and monitor patient information directly on the web-based platform, including updating patient contact details, (preferred) health facility and treatment information while the patient is present.
Constrained capacity	3. Modify RFIS to automatically flag duplicate patient data (for checking) or similar patient data (to verify).
Lack of trust in and use of data	4. Modify RFIS so reporting includes adherence rates for all patients for each facility to reflect on-the-ground experiences (i.e. monthly adherence rates) as well as clinical success (80% compliance).

	5.	Consider changing calculation of monthly adherence rates to rolling totals rather than statistics based on fixed quarters or years.
Lack of trust in and use of data; constrained capacity	6.	Modify RFIS so reporting allows practitioners to monitor individual patient's adherence (for tracing) and overall success relevant to their facility as well as nationally, at any point.
Constrained capacity	7.	Consider strategies to provide greater support and capacity should be directed to poor performing facilities (those with lowest compliance in terms of patient adherence rates).

4.2. Output 2: Best practice clinical guidelines

The overall performance of the best practice guidelines for the clinical care of patients with ARF/RHD ("best practice clinical guidelines") is shown below. The section following provides the overview of evidence supporting this assessment.

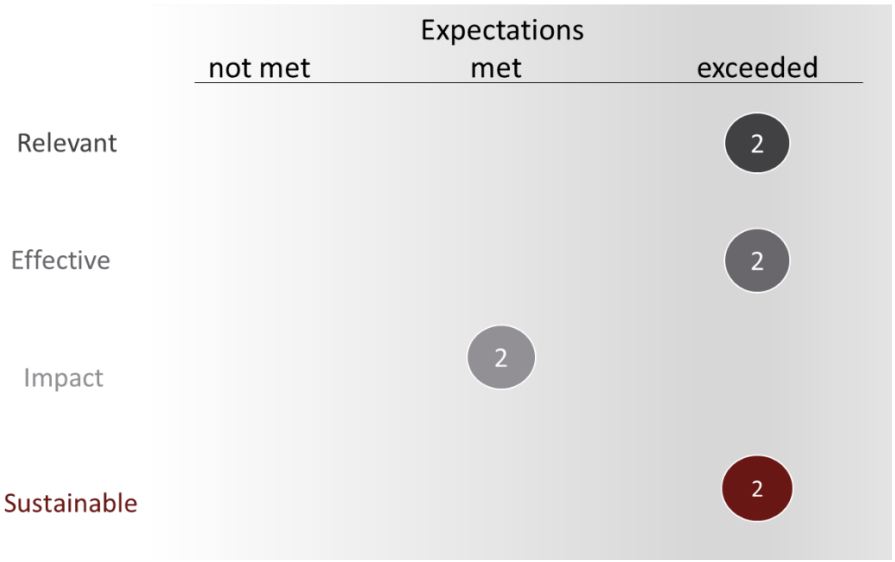


Figure 5: Overall performance of the best practice clinical guidelines (weighted as a 'moderate value' output).

4.2.1. Output 2 exceeded expectations in terms of relevance, aligning to Fiji systems and people and integrated the practices of all relevant staff.

The guidelines were developed to improve the delivery of effective and comprehensive services to patients in Fiji. Prior to the introduction of the guidelines, practitioners were reported to have made use of other clinical guidelines, such as a specific section of the national antibiotic guidelines set aside for ARF/RHD or clinical guidance developed for other countries (HP09, ST04, ST15). The best practice guidelines were developed specifically for the Fiji context, and in consultation with the MHMS, chairs of the Activity's Steering Group (SG) and Technical Advisory Committee (TAC) as well as clinicians across the country (DOC18). The multi-staged process included the writing and referencing phase, iteration, review by the National Medicines and Therapeutics Committee (NMTC), another external review and final approval. The guidelines set out the information necessary for clinical care and management of patients with ARF and RHD (e.g. guidance and information on epidemiology, diagnosis and referral pathways, management of ARF and RHD). The guidelines were signed off and endorsed on 28 April 2017 (DOC8D). Interviews suggested no significant challenges to aligning these guidelines within the current Fiji health system and people practices.

To enable easy access, the guidelines have been:

- Distributed as printed copies (full version) and one-page summary and posters to health facilities across the country (DOC8D).
- Made available for download as a full document (http://www.health.gov.fj/wp-content/uploads/2019/08/Fiji-Guidelines-for-Acute-Rheumatic-Fever-and-Rheumatic-Heart-Disease-Diagnosis-Management-and-Prevention.pdf).
- Made available on a 'easy to navigate' phone app, which is then available offline.

The app was developed for health professionals to download and use from their smart phones without requiring internet connectivity, which was of particular relevance where the internet was not readily available to practitioners. One manager further noted the value of the downloadable materials, as it incurred no additional logistics or costs. Observations and interviews demonstrated the accessibility of the guidelines, showing the guidelines on desks, personal phones, bookshelves and walls (HP01, HP12, HP14, HP15).

Many health practitioners interviewed demonstrated an awareness of the guidelines and content (HP01, HP03, HP06, HP12, HP14, HP15, HP17) while others reported being aware of the changes but not the guidelines document (HP08, HP16). This awareness of the specific changes, such as the change to the recommended Benza dosage, may likely be due to these specific changes being reflected in other RHD resources; these were observed in the ARF and RHD patient register books (HP03, HP13, HP14).

4.2.2. Output 2 exceeded expectations in terms of effectiveness, with predominantly consistent reports and demonstrated knowledge relevant to the management and care of RHD patients.

Training was provided to improve awareness and knowledge, covering topics relevant to the RHD, such as adherence (e.g. benza stocks and injection techniques) and content relevant to the guidelines. The ARF and RHD training has reached 2,651 nurses, physicians and dentists thus far (ST16). Training was delivered as:

- A national medical officer training of trainers (ToT) which was followed by a series of divisional level training reaching a total of 191 medical officers. The medical officers receive their training from specifically trained physicians (ST04, ST15), and aimed to strengthen clinical diagnostic capacity.
- The nurse training programme[18] continued in all divisions with 1468 nurses attending RHD training in 2016/17 (DOC8C), and a further 449 nurses in total attending the two-day training sessions in 2017/18 (DOC8D). Since 2017, ARF/RHD training was also provided to community health workers (DOC33), after a community health worker training manual was developed and endorsed by MHMS (DOC8C, DOC60). Divisional coordinators led the training for nurses and community health workers.

Documents suggested a marked improvement in knowledge for all nurses at the time of completion of training (DOC 34, pg. 4): "The semi-structured interview information consistently demonstrated that the nurses who had completed training felt that their knowledge and ability to understand the signs and symptoms of ARF had

[18] It was reported by one stakeholder that the training was adapted a two-day to a one-day training session, and a one-hour awareness raising session with nurses who were less likely to manage ARF/RHD patients on a regular basis.

improved. The post-test results indicated that their level of knowledge was high". During interviews, health practitioners regularly referenced the guidelines when noting the signs and symptoms of ARF and RHD, changes to the frequency and weights associated with Benza dosage, and the Jones criteria (HP03, HP04, HP05, HP06, HP08, HP11, HP14, HP16, ST10). Further, an RHD programme staff member noted that fewer questions regarding the diagnosis and treatment of RHD were being raised by health practitioners who had the opportunity to source the answers themselves.

Nevertheless, one participant noted the health practitioners' knowledge required for the management and care of RHD patients was not consistent, reporting that few people knew of the Jones criteria or the common reactions to Benza. Few practitioners reported gaps in the use of the guidelines, beyond themselves (HP02, HP05, HP12, HP13), and it was further recognised that there is still more work to be done in this area, in particular in building understanding of the content within the guidelines (ST03, HP12). Other relevant secondary data, such as the 'knowledge, attitudes and practices' survey of health practitioners, were not available at the time of this report, but will be vital to assess if the guidelines improved practitioner knowledge and practices.

As reported above (c.f. Table 2), adherence to secondary prophylaxis rates appear to be improving. This result, in part, was attributed to the guidelines and the resultant improved care (ST). Given the inability to estimate improved knowledge across areas, this belief would require further investigation.

4.2.3. Output 2 met expectations in terms of impact, with some initial (albeit few at this stage) broad benefits for the health system and population of Fiji.

The guidelines were believed to build the capacity of the health system by providing a standardised clinical care pathway to support the management and control of rheumatic fever and rheumatic heart disease. They do this by collating, promoting and contextualising recent and international best practice, including (DOC61): "the Jones criteria update 2015, The New Zealand Guidelines for Rheumatic Fever 2014, The Australian Guidelines for Prevention, Diagnosis and Management of Rheumatic Fever and Rheumatic Heart Disease 2012, the Fiji Cardiovascular Guidelines 2015, the Fiji Obstetrics and Gynaecology Clinical Practice Guidelines 2015, the Fiji National RHD Policy 2015, the Fiji MHMS National Strategic Plan 2016-20, the World Heart Federation Diagnosis and Management of Acute Rheumatic Fever Rheumatic Heart Disease 2008 and the WHO Expert Consultation Technical Report: Rheumatic Fever and Rheumatic Heart Disease 2003."

The guidelines were widely valued as evidence-based, clinically proven practices among health practitioners and stakeholders (HP01, HP06, HP13, HP15, HP17, HP19, ST01, ST04). The guidelines were referenced as a "black-and-white" source of truth. Many examples were given and observed, whereby the reported improved knowledge enabled staff to provide systematic care and support the management of RHD patients (HP01, HP02, HP03, HP06, HP11, HP12, HP14, HP15, HP17, HP19; ST01), for example:

- Reported in interviews and observed, nurses and divisional coordinators questioned where treatment plans did not align with the guidelines, "*Before I just keep giving the dosage the doctor initially prescribed but now because it's written [I can question the treatment]*".
- Guidelines were reported to help promote adherence, providing information necessary to convince PLWRHD to regularly attend treatment.
- Guidelines were reported as standardising the knowledge and practice around ARF and RHD across the country, enabling standards of care for patients and building a shared message to people - "*everyone is singing the same song*".
- Guidelines and training[19] were reported as helping practitioners engage and relate to patients.
- Guidelines were reported to have improved practitioner confidence to provide clinical care for PLWRHD.

One document suggested recent increases in newly diagnosed cases of RHD and ARF are due to the capability building (DOC8D). An independent analysis of RFIS data demonstrated that ARF and RHD diagnoses have increased marginally since the guidelines were released (2017). However, as noted in Figure 6, the increased

[19] The training was relevant to the broader activities, including but not limited to Output 2.

diagnoses in RHD are likely due more to the proactive[20] echo-screening programme in Suva rather than training related to the guidelines across Fiji.

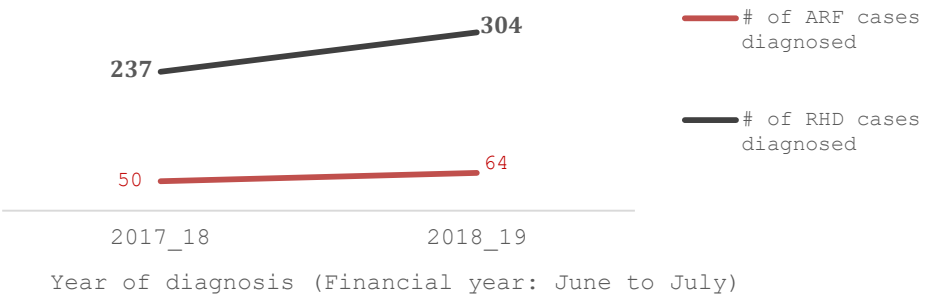


Figure 6: Numbers of ARF/RHD diagnoses, by year of diagnosis, in Fiji.[21]

To understand the benefits of the guidelines in terms of diagnosis, it will be useful to understand if nurses are now feeling competent to diagnose ARF and refer new RHD cases. It is understood that the RFIS has recently made changes to require this information.

4.2.4. Output 2 exceeded expectations in terms of sustainability, with a demonstrated acceptance of and commitment to the guidelines across the health system.

Over the four years of the Activity, the development and distribution of the guidelines, along with the associated training, accounted for approximately $321,000 of the overall MFAT funded budget (DOC8A, DOC8B, DOC8C, DOC8D). As the guidelines are now produced and broadly available online, incurring no additional distribution costs, it is expected that MHMS will be able to continue to use and integrate the guidelines more efficiently than this development phase.

Training was reported as a key deliverable of the secured resourcing – notably divisional coordinators – and this training will continue to raise awareness and understanding of the clinical guidelines. It was broadly expected that greater numbers of practitioners will use the guidelines, as they become more widely known and become the norm in terms of clinical practice.

The guidelines are broadly accepted by health practitioners, without exception (ST01, HP04, HP07, ST04, ST13, HP08, HP14), and health practitioners were observed promoting the use of the guidelines (HP12, HP14). These commitments and expectations coupled with the readily available free app have ensured that Fiji is well placed to maintain the current momentum of promoting alignment of clinical practice to these guidelines. Sustainability and ongoing efficiency would be further supported once the guidelines are formalised into the medical training at Fiji universities (HP04, ST04, SS1), reducing the training requirements as new health practitioners enter the field.

4.2.5. Further considerations for the best practice guidelines moving forward

The use of relevant research and expertise within the Fiji context has enabled trust across the health profession, and the training has raised awareness and use, as has embedding key pieces of information in register books and posters. It is recognised that the Activity provided training to Year 5 medical students at Fiji National University, and Years 5 and 6 medical students at the University of Fiji (HP04, ST06). This is planned to be formalised within the curriculum. Nevertheless, some barriers remain relevant to the guidelines, such as:

[20] Here, "proactive" refers to health professionals visiting people in their everyday environments (e.g. in schools or homes) *before* symptoms of RHD emerge.

[21] While the Activity aimed to reduce the burden of ARF/RHD morbidity and mortality, several stakeholders noted their expectations that these numbers would initially increase as more cases are identified early, and that over time, may demonstrate the expected reduction.

1. **Information sharing:** It was reported that information was not being shared between health professionals after the training (HP08, HP17).

2. **Capacity / Capability**
    a. **for training:** It was reported that delivering further training, in particular MO training, is limited insofar as there are few trainers and they have little available capacity (HP08, ST04, ST15). Although the numbers requiring training were not explored during the evaluation, the common recommendation made by health practitioners throughout the evaluation was to make more training available.
    b. **for review**: Ongoing review cycles are important to ensure the recency of the guidelines in line with current research practice and needs.

Further recommendations are provided below.

Table 4: Recommendations to enhance achievement from the guidelines

Findings	Recommendation
Limited capacity/capabilities relevant for review	Secure the required capability for the working group to conduct regular reviews of the guidelines.
Limited capacity for training	Consider strategies to enhance training capacity, and continue training current health practitioners as well as *future* health practitioner while formalising the guidelines into all relevant medical training curriculum.
Few realised benefits (to date) for Fiji	Assess adherence to the guideline recommended practices, identifying gaps in practice and share these results with current practitioners.

4.3. Output 3: Echo case detection

The overall performance of the early detection programme is shown below. The section following provides the overview of evidence supporting this assessment.

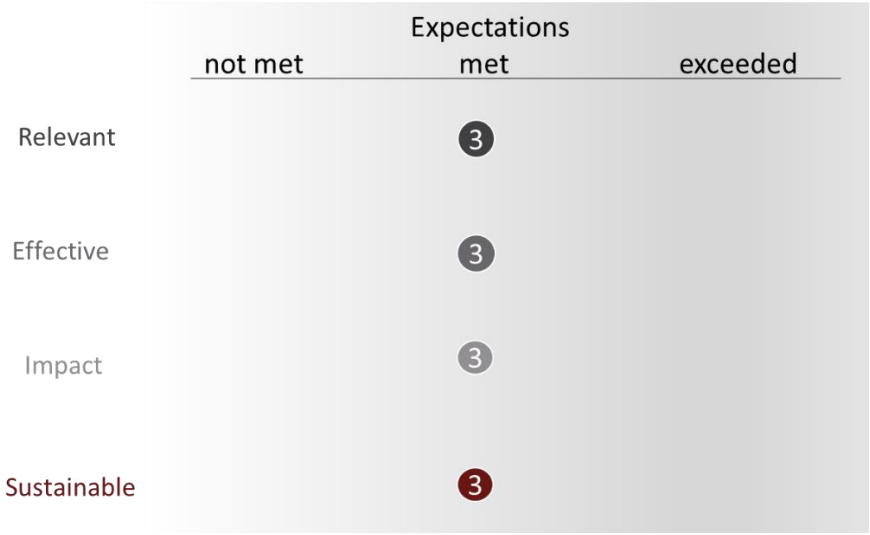


Figure 7: Overall performance of the echo screening (weighted as a 'low value' output)

4.3.1. Output 3 met expectations in terms of relevance, mostly aligning with the needs of the Fiji population

Echocardiography, or the test that uses sound waves to produce live images of your heart, is five times more sensitive to detecting RHD than clinical examination for detection using other approaches such as auscultation[22]. It is also more efficient, with echocardiography averaging less than four minutes per patient. However, echocardiography requires not only the equipment but the training and capacity to undertake the screening. To address this need, the Activity trained a total of seven health professionals (two paediatric registrars, one adult registrar and four sonographers) from all divisions, each receiving 12-month echo workforce training (DOC8C) to improve clinical capacity to diagnose RHD, and approximately 15 MHMS personnel trained to detect changes associated with RHD over the four years (DOC8C, DOC8D).

Feasibility, of systematic RHD echo screenings targeted at school-aged children in Fiji as a model for early case detection, was considered (DOC8C, DOC39, DOC40). A nurse-led school-based echo screening pilot was approved by MHMS. From the outset, the programme was integrated within an existing program (school health) that was already being implemented by the MHMS. Four nurses trained (as 'non-expert' screeners) to undertake echo screenings of Class 6 students in Suva (DOC8D, DOC39). One stakeholder reported that the training aligned to the World Health Organisation's recommendation, specifically to build capability of less experienced staff (here, nurses to undertake such tasks and increase overall capacity). The approach was new as physicians and sonographers traditionally perform echo screening in Fiji, including undertaking both auscultation and echocardiography (ST07, HP03, HP11, HP15).

Stakeholders viewed this approach as a promising way to diagnose RHD early in Fiji, making use of nurses' skills while proactively screening for signs of RHD *before* more severe symptoms emerge (HP02, ST08, ST09, ST15). However, others interviewed believed that there remains significantly more opportunity to train nurses to undertake echo screening (HP15, ST15).

The supply of the screening capacity was behind the reported high demand for this service (HP2, HP12, HP13, ST05). Particularly in the rural places, auscultation was reportedly still common practice (HP12, HP15, HP16,

[22] The research, conducted prior to the WHF guidelines (2012), was cited from Reeves, BM, J. Kado, M. Brook (2011). High prevalence of rheumatic heart disease in Fiji detected by echocardiography screening. Journal of Paediatrics and Child Health 2011 Jul: 47(7), 473-8.

HP17). Expanding the screening service (HP04, ST04, ST13, ST17), however, requires evidence that local capacity can manage the diagnosed patients (both in terms of confirmation of diagnosis and the provision of secondary prophylaxis); otherwise, diagnosis is viewed as unethical[23].

Alongside the echo workforce trainings, the Activity built echo equipment capacity in Fiji. To meet some of the needs, the Activity launched and operated a mobile clinic using portable echocardiography machines to screen and review school-aged children in the Western and Central Divisions (DOC8B). The Activity provided a van equipped with two beds and handheld echo machines to operate the pilot and visit schools (Figures 8 and 9).

[23] Wilson and Jungner criteria for screening, notably principle 3, states "facilities for diagnosis and treatment should be available" (http://medicalcriteria.com/web/epiwj/).

Figure 8: RHD van at a primary school

Figure 9: Hand-held echo machine inside the van

Beyond the school-screening pilot, there are now three additional portable echo machines available (two hand-held, which were observed being used for the school screening pilot, and one Vivid Q machine) compared to the only divisional hospital that had access to echo machines prior to the Activity (DOC18). The map below shows (as red dots) the distribution of echo machines across Fiji, focusing on the main centres with the largest populations – Suva, Lautoka and Labasa. However, having so few machines means an increase in the time and travel costs for those living outside of these centres, in particular those people from the maritime areas.

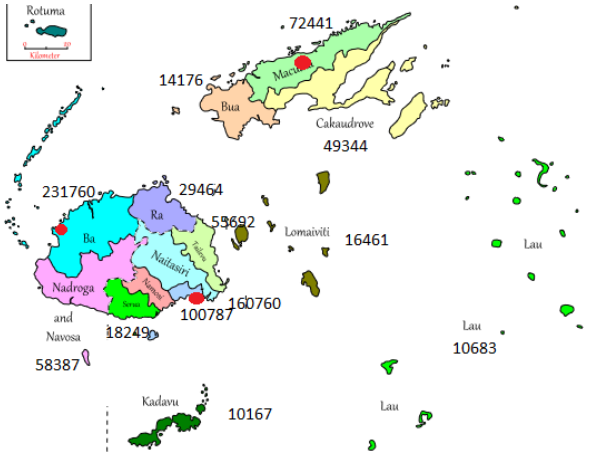


Figure 10: Map of Fiji showing known locations (red dots) of echo machines

Although in high demand (HP12) and requiring maintenance and repair (HP05, HP08, HP12, ST06, ST15, ST19), portable echo machines and training have enabled the health system to detect RHD more broadly than these main centres, which is of particular relevance in the Fiji context where 44% of the population is living in rural areas (Fiji 2017 Census). Such activities, along with the portable equipment and capacity, are key in places like Fiji, where distance and travel are such widely recognised barriers to the care and treatment of RHD (DOC17, DOC34, HP01, HP09, HP11, HP14, HP15, HP16, HP17). Further, it is understood that the echo machines in Fiji are aging (with one machine reportedly inactive and requiring repairs), and the warrantees and maintenance of the machines are understood as essential to ensure continued use.

4.3.2. Output 3 met expectations in terms of effectiveness, improving and expanding early case detection, with particular success among school-aged children.

As noted above, the output provided training and equipment which improved Fiji's capacity to detect RHD. With increased capacity in terms of technical capability and equipment comes the expectation that there will be greater numbers of RHD diagnoses. Views were mixed, with some health practitioners believing they experienced an increase in the numbers of diagnoses over the recent years (HP05, HP07, HP15) whereas another has witnessed similar numbers of diagnoses.

RFIS data demonstrated RHD diagnoses decreasing after 2015/16; the high numbers diagnosed at that time were claimed, by one stakeholder, to be due to a research project that was underway. From 2016-17, the numbers of RHD cases diagnosed in the Northern Division for one year declined (until 2017/18) and then remained stable between the 2017/18 to 2018/19 financial years. The Western Division maintained similar numbers of RHD diagnoses across the three financial years from 2016/17 to 2018/19. However, and most notably, the Central/Eastern Division increased the numbers of RHD diagnoses between 2017/18 to 2018/19 by 85%, from 110 to 193 RHD cases identified. This is largely unsurprising given the proactive (school-visit) approach and added capacity to the school-based programme in Suva; this programme completed 1617 (primary school children) echo screenings in 2017/18 alone (DOC8D).

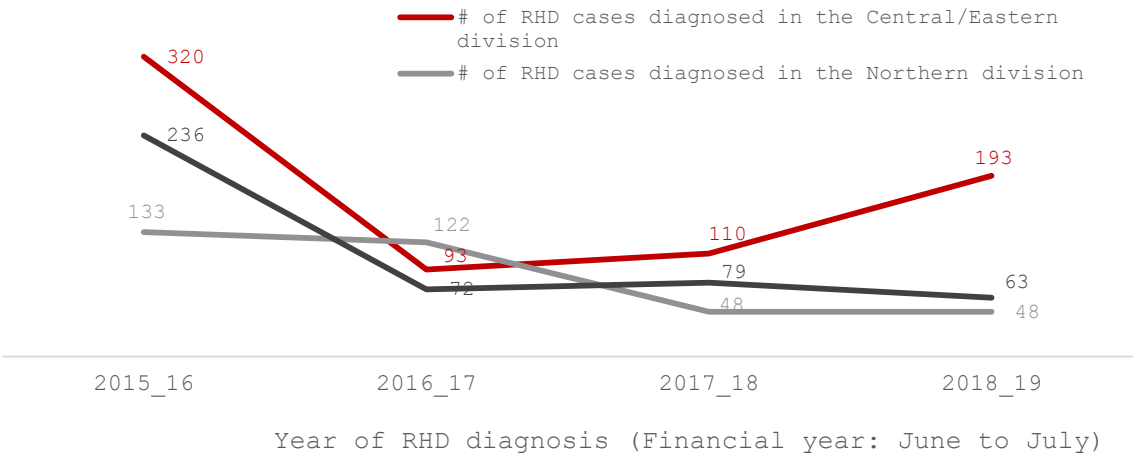


Figure 11: Numbers of RHD cases (suspected and confirmed) over four financial years

It is further unsurprising that of those diagnosed with RHD in the Central/Eastern Division, 42% of the 93 diagnosed were younger than 14 years old in 2016/17, but this proportion increased to 57% of the 110 diagnosed and 78% of the 193 diagnosed in 2017/18 and 2018/19 (respectively).

The benefit of the school-based approach for young people is clear. If these young people were removed from the above analysis, the Central/Eastern Division would not have experienced any increase in the numbers of RHD diagnoses between these later two financial years. The proactive case detection approach (visiting individuals before they require medical attention) removes the traditional barriers to diagnosis (e.g. travel costs, time, availability of equipment) (c.f. section 4.3.5).

Apart from numbers of RHD diagnosed, it was expected that having additional early detection capability will enable earlier identification of less severe RHD. This achievement could not be determined with the current data.[24] Continuing to monitor this, and sharing the results of such indicators with the health sector, would likely retain the focus on diagnosis. Further capability (portable machines) and capacity (trained nurses) would likely further extend the benefits to more communities.

4.3.3. Output 3 met expectations in terms of impact, with a strengthened health system albeit resulting in few broad benefits for the population of Fiji at this stage.

As noted above, echocardiography takes less time to perform and is five times more sensitive to detecting RHD than other approaches. The initial cost of the machines, in addition to the training costs for individuals to conduct echo screening, had limited these types of examinations in Fiji prior to the Activity. The longer-term benefits of the Activity have been evidenced above, demonstrating a strengthened Fiji health system through echocardiography training of seven physicians and sonographers from all divisions, and four nurses from the Suva Subdivision (c.f. section 4.3.1). The training reportedly increased capability in detecting carditis of ARF

[24] It is understood that the current RFIS data does not differentiate between current RHD status and status at the point of RHD diagnosis. Further modifications to RFIS may need to consider the need for such distinctions.

and valve changes associated with RHD (DOC8C, DOC8D). Further, these newly trained physicians and nurses are performing echocardiography and are engaged in outreach activities using the portable devices (HP06, HP07, HP12), reaching populations that may otherwise not have been reached.

Further, the nurse-led school screening pilot was being conducted weekly at schools. One document (DOC8D) noted that a total of 1617 primary school children were echo screened for RHD and a total of 43 previously unknown cases were subsequently diagnosed as definite RHD in 2017/18. Further evidence from an analysis of RFIS (c.f. section 4.3.2) showed an increase in RHD diagnoses in the Central/Eastern region; the increased capacity positioned in the region was arguably contributing this increase in RHD diagnoses among school-aged children.

4.3.4. Output 3 met expectations in terms of sustainability, with a commitment to continue echo-screening and plans in place to build the required further buy-in.

Commitment from both the Fiji Government and MHMS are evident in recent decisions and actions taken by both. The Fiji Government allocated FJD150,000 in its 2019/20 budget for the RHD Prevention and Control Program to "contribute to maintaining a high-skilled health workforce, trained in ARF and RHD diagnosis and management" (DOC61). While it is yet to be decided how this budget will be invested in detail, some budget will be required to maintain the current equipment. It was also reported by two stakeholders that the Ministry plans to expand the nurse-led school screening pilot.

Over the four years of the Activity, the echo screening programme accounted for approximately $815,000 of the MFAT-funded budget (DOC8A, DOC8B, DOC8C, DOC8D). As such, the plans to extend this service will likely require additional funding. However, it should be noted that sustained adherence to secondary prophylaxis is required in order to expand the screening service (HP04, ST04, ST13, ST17). Secondary prophylaxis demonstrates that the local capacity can manage the diagnosed patients; as noted by one health practitioner, diagnosis is only ethical if people can access and be supported in their treatment. The most significant factor limiting echo screening in Fiji appears to be human and resource capital within the broader health system capacity. As noted earlier, echocardiography machines are in high demand and require ongoing maintenance, and diagnosticians were not always available. Staff turnover, in particular staff relocating after training, is an ongoing concern by a number of interviewees and system capacity remains the biggest risk.

Stakeholders suggested that building the system capacity to diagnose RHD early will likely be a focus for the upcoming years. Sustaining the capacity while ensuring access to all those in need in Fiji remains the risk. It is understood (stakeholder interviews) that additional funding sources are being sought to support the Activity, including MFAT and Fiji Water Foundation. With other NGOs engaged in similar initiatives in Fiji, there are potential opportunities in linking up and coordinating efforts (HP10, SS1, ST10, ST13). For example, the Sai Prema Foundation[25] is offering free echo screenings for children in Suva since their clinic opening in April 2019.[26]

4.3.5. Further considerations for the echo screening programme moving forward

The Activity is planning on continuing and likely expansion of the echo-screening service. Nevertheless, there remains significant barriers to the echo-screening programme in meeting the needs of the population. These are:

1. **Limited capacity**
    a. **to diagnose:** It was reported broadly that there are currently too few machines and individuals with the required training to undertake echo-screening in Fiji.
    b. **to counsel:** There was limited availability of the trained staff, and time available with each patient and the lack of privacy during the outreach (HP04, HP06, HP07, HP09, HP12). Health practitioners noted that there was insufficient time for proper counselling, particularly with newly detected RHD cases. It was recognised that this initial counselling for the family was key to support secondary prophylaxis.

[25] This service conducting echocardiography in Fiji does not require patients to make an appointment.

[26] Fiji's The SUN, 25 April 2019, https://fijisun.com.fj/2019/04/25/free-screening-offered-for-children-with-congenital-heart-disease/

2. **Staff turnover**: The capacity challenges are compounded by staff turnover, including recruitment of divisional coordinators and retention of trained staff. The challenges related to turnover further include changes in government leadership.
3. **High costs:** Reports were consistent in that the echo machines are expensive to purchase and require ongoing maintenance, and training requires significant amounts of time to develop the required capabilities.
4. **Significant distances between capacity to diagnose and need:** There are sometimes significant distances between the communities and the available capacity to diagnose RHD, requiring health practitioners to travel to patients (reportedly several hours drive in some cases, with limited availability of vehicles and in challenging road conditions, HP01, HP11, HP14) and/or patients to travel to health facilities with adequate capacity (reportedly with the limited transport options and unaffordable costs, HP09, HP14, HP16).

Given the likely costs associated with training, equipment and maintenance across Fiji, coordinated efforts and additional funding will be key to continue to progress towards early diagnosis using echo screening. Further recommendations are provided below, for the steering group to consider.

Table 5: Recommendations to enhance achievement from the echo screening

Findings	Recommendation
Limited capacity to diagnose and counsel	Consider strategies necessary to enable training greater numbers of health practitioners and community workers to recognise symptoms of ARF and RHD; and greater numbers of health practitioners, in particular nurses, to undertake echo screening to identify RHD, in particular in regions where there is limited capacity.
	Secure capacity required to work with patients, particularly at diagnosis stage.
Significant distances between capacity to diagnose and need	Procure additional portable machines, and ideally machines that can either record or print images, once secondary prophylaxis rates are reasonable.
Few realised broad benefits (to date) for the Fiji population	Consider broadening the pilot to include further schools, and greater numbers of classes and ages being screened while already at the school.
	If there is adequate compliance with secondary prophylaxis, consider prioritising echo screening for vulnerable communities (i.e. pregnant women, communities with poor housing) and how to implement a broader open-door policy to echo screening, whereby no appointments are necessary (i.e. open days, RHD hub).

4.4. Output 4: Health promotion

The overall performance of the health promotion activities is shown below. The section following provides the overview of evidence supporting this assessment.

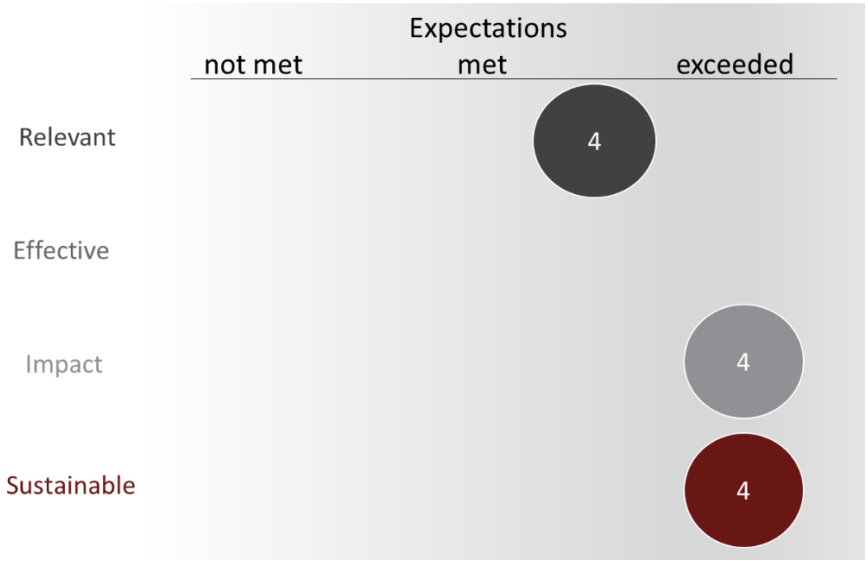


Figure 12: Overall performance of the health promotion activities (weighted as a 'high value' output)

4.4.1. Output 4 met expectations in terms of relevance for Fiji, showing campaign materials targeting health facilities and staff, patients and their families, and the broader population.

A stakeholder reported that a health promotions campaign and the corresponding messages were informed by focus group discussion and the KAP survey data, and this data informed a targeted campaign targeting "parents and carers of school-aged children and people with a history of rheumatic fever or rheumatic heart disease" (DOC8C, pg. 5) and health practitioners. Documents supported this report, showing that the KAP survey (n=400) setting out recommendations around health promotion messages (DOC45), and a document later suggested that this information "will" be used (DOC48).

The resources included:

- Educational materials disseminated to health facilitates, focussing on patients of all age group (e.g. education flip charts, 2017 and 2018 calendars and personal (hand-held) Benza injection cards for patients (DOC8C, pg. 3).
- Materials produced for health practitioners (e.g. diagnosis of ARF criteria and algorithm charts as well as ARF clinical posters for health professionals).
- Materials reaching out to individuals directly (e.g. different versions of ARF posters, ARF awareness flyers, ARF campaign videos on social media (e.g. Facebook campaign), ARF campaign radio advertisements (in three languages), celebrities with RHD appearing in TV talkback shows, newspaper articles and Fiji's biggest festival, the Hibiscus Festival (DOC8D), updates on the MHMS website, testimonials of PLWRHD and talkback shows.

The interviews and observations demonstrated alignment to the Fiji context, and were observed across the health facilities (HP03, HP05, HP06, HP08, HP09, HP11, HP13). Only one health practitioner interviewed noted that not every health facility had the educational flip chart. Health practitioners interviewed reported using the calendars (when available) and flip charts (HP01, HP3, HP05, HP09, HP11, HP14, HP15, HP16, HP17). The resources, and in particular the flip charts, were believed to help patients and caregivers understand the condition and importance of the regular treatment and to support non-RHD experts communicate complex messages to communities (HP02, HP05, HP17).

The national multi-media ARF promotion campaign used different channels and simple messages to reach both the general public (DOC49) and PLWHRHD. The Activity found an advocate and local RHD champion in Ms Buli Wainiqolo, a person living with RHD and who participated in the national Hibiscus Festival, to raise awareness about the disease (ST03, ST04, ST06). Ms Wainiqolo featured in a series of TV advertisements, radio segments and appeared in social media promotion activities including Facebook (MHMS page and Fiji RHD page) ads targeting audiences which received thousands of views in 2017 (DOC49). A stakeholder further clarified that this ad had achieved 4,400 views on MHMS FB page, 43,190 views on Fiji RHD page, and was viewed 77 times from 22 June 2018 to 31 July 2018 on FBC TV. Additionally, a five-minute ARF video was made featuring Dr Sainimere Boladuadua which received a high volume of views on Facebook (a stakeholder reported statistic was that this achieved 5,100 views on MHMS Facebook page/14,666 views on RHD Facebook page). Further evidence would be required to determine if the campaigns reached the intended target audiences.

4.4.2. The available evidence was unclear in terms of the effectiveness of output 4

As listed above, a range of campaign materials and content were delivered with the aim to improve public awareness of ARF/RHD and health literacy amongst practitioners. The Activity conducted knowledge, attitude and perception (KAP) surveys with health professionals (DOC43) and communities (DOC45) to inform the Activity's health promotion output. The baseline survey showed little knowledge and understanding of ARF and RHD across communities in Fiji, particularly among caregiver and parents (DOC8C). At the time of writing this evaluation report, KAP follow up surveys results were not yet available.

Nevertheless, the perceptions about changes in knowledge and awareness were mixed among health practitioners and stakeholders. Some interviewed health practitioners recognised greater awareness of RHD among the population (HP01, HP02, HP03, HP04, HP09, HP14, ST03, ST05), reporting that more people are showing up in hospitals and clinics asking for RF check-ups and treatment (HP02, HP03, HP14) and referring to TV and radio appearances or announcements (HP03). It was also suggested that more people were talking about RHD when compared to four years ago (HP03, ST03, ST015) - "*It's really a big thing now*". However, others didn't believe the public were more aware (HP06, HP07, HP12, HP15, HP17, ST08).

4.4.3. Output 4 met expectations in terms of impact, with few broad benefits for the health system and population of Fiji.

The health promotion activities were intended to build awareness and understanding, promoting health-seeking behaviour among the population and supporting overall adherence to treatment. As above, notifications of RHD are also increasing (see Figure 4) and adherence to secondary prophylaxis is improving (see Table 4); among a range of possible contributors to these achievements, one stakeholder believed this may also be due to an increase in awareness and understanding of the disease and treatments. Others reported health promotions as supporting the Fiji health system as:

- Nurses were reported as building closer relationships with their patients over the conversations they are now having with them and can feel their patients' trust in them (HP06, HP09, HP16, ST01) (also linked to output 1).
- Health messages are being shared by non-health professionals (HP04, HP07, HP09, HP16), with one example provided about a child teaching the parents about ARF and the importance of secondary prophylaxis (also linked to output 1).

4.4.4. Output 4 met expectations in terms of sustainability, with the current capacity able to continue delivering the health promotion messages. Further funding will be required to refresh or expand the campaign.

ARF and RHD-trained health practitioners, community health workers, parent advocates and young PLWRHD acting as champions provide a diversity of health promotion messengers. Support groups were considered key to delivering health messages to PLWRHD and the broader community. Current practitioners and community health workers engage in health promotion as part of their day-to-day practice (e.g. giving talks, making home visits) (HP01, HP03, HP06, HP09, HP17). Resources, such as flip charts and calendars, reportedly enabled task-shifting, moving the responsibility of sharing ARF/RHD messages from health practitioners to community workers (HP04, HP07, HP09, HP16). Community health workers were recognised as having contacts to the community, with one nurse described them as her "hands and eyes" in the community.

Across all tiers of service there is an expectation that health promotion will continue (ST03, ST04, ST05, ST06, HP03, HP14). As health promotion is embedded into health practitioner's practice, it is expected that the messages will be sustained over time. This widely-held expectation will promote continued demand for resources, as will the government expectation that RHD remains a priority. However, any additional resources, and further health promotion campaigns (e.g. Facebook, radio, tv) will incur a cost; future allocation of funding will need to consider these costs along with the recognition that more work was needed to raise awareness among the public (HP06, HP09, HP12, HP15, HP16, ST03).

4.4.5. Further considerations for health promotion activities moving forward

Health practitioners and stakeholders widely viewed the messengers as key contributors to success, delivering health messages across communities while advocates and champions attracted people's attention and make them listen (HP06, ST15). The current resources enable this task-shifting to occur. Although the messengers continue to deliver messages, barriers remain for RHD health promotion in Fiji. These are:

1. **Limited capacity**
    a. **among health practitioners:** Sustaining the health messages through practitioners is a risk given the limited capacity reported by stakeholders and practitioners (HP01, HP02, HP03, HP06, HP14, ST01). Further, practitioners reportedly lack the necessary time to sit down with the patient or caregiver to convey the required information and messages (HP12).
    b. **within MHMS:** MHMS does not currently have a communications unit to develop further communication strategies, campaigns and resources (SS1, ST03), although there remains a desire to extend health promotion in terms of forums and RHD events. This may be of particular importance if parents are getting tired of hearing the same message, as suggested in one interview (HP16).

The following recommendations are made in relation to these barriers as well as the broader findings relevant to the health promotion activities.

Table 6: Recommendations to enhance achievement from the health promotion activities

Findings	Recommendation
Limited capacity	Consider how to maximise existing structures to convey messages to the populations (e.g. adding messages into the education curriculum), and develop materials to support local use of resources, and identify opportunities within the community (e.g. church groups, community leaders) to expand on reach with limited capacity.
	Consider procurement to acquire relevant marketing skills to understand and further expand on the existing campaign
	Strengthen PLWRHD organisational support, and PLWRHD must be central in all program

	activities going forward.
Few broad benefits (yet realised) for the Activity	Undertake market research to understand motivators to change behaviours towards the desired behaviour, and identify and define segments of the at-risk audience groups (language, age group, location) and how best to reach them (messages, modes of communication, source and images of the messages, posters, child sticker calendars).
	Undertake market research to evaluate specific aspects of the current campaign in terms of reach and effectiveness.
	Design a health promotion campaign to maximise the impact of the money spent on campaign design and delivery, while promoting behaviour change in terms of antibiotic adherence as well as early identification of symptoms.

4.5. Output 5: Primary prevention guidelines

The overall performance of the primary prevention guidelines - *Fiji Sore Throat and Skin Disease Diagnosis and Treatment Guidelines* - is shown below. The following section provides the overview of evidence supporting this assessment.

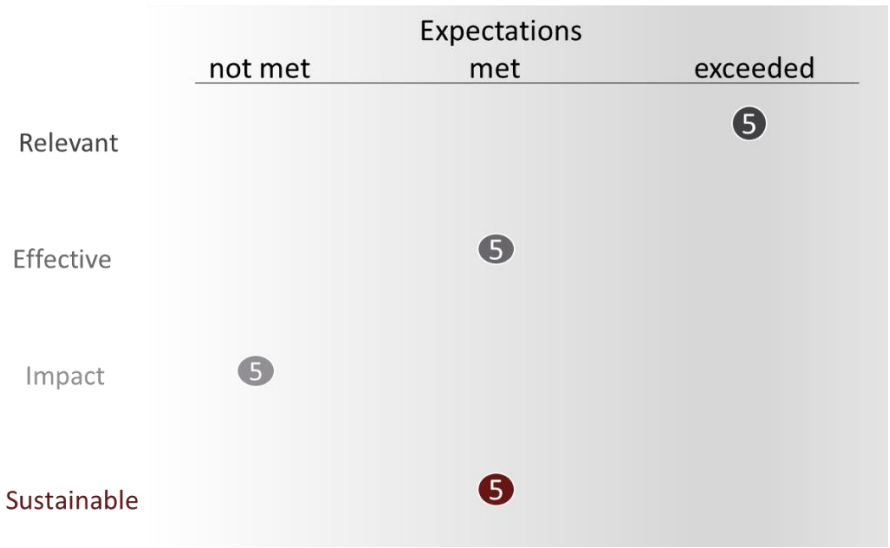


Figure 133: Overall performance of the primary prevention guidelines (weighted as a 'low value' output)

4.5.1. Output 5 exceeded expectations in terms of relevance, setting out guidelines that align to the Fiji context.

As with the ARF and RHD best practice guidelines (output 2), the primary prevention guidelines involved health experts and local advisers, went through an iterative process and have been approved by the NTMC (DOC8D). They were intended to improve the diagnosis and management of Group A streptococcal (GAS) sore throat to prevent ARF. The Fiji context resulted in unique challenges for setting out guidelines. The clinical decision rule for diagnosing GAS needed to align with best practice (e.g. throat swabs) but it was vital that the rule was feasible in the Fiji context (e.g. limited opportunity to undertake throat swabs). Coming to a consensus was a challenge.

The finalisation of the primary prevention guidelines were delayed (HP04, ST06, ST17). Nevertheless, the primary prevention guidelines are now available for download (http://www.health.gov.fj/wp-content/uploads/2019/08/Fiji-Guidelines-for-Sore-Throat-and-Skin-Disease.pdf), and available to an offline-ready app (ST03, ST06). As such, the guidelines are now available to all targeted at health professionals in community, public health, primary and secondary care settings, as it set out to do (DOC32). Further awareness raising will be required, to ensure uptake and use (see below).

4.5.2. Output 5 met expectations in terms of effectiveness[27], with expected outputs delivered and clear plans to train health care professional moving forward.

Now that the guidelines are available, it would be expected that these are understood and used to diagnose and treat GAS infection. There were established targets that 990 health care professionals were trained in ARF/RHD primary prevention. It is understood that these targets were not yet achieved due to the relatively late release of the guideline. This training is currently underway and planned for further delivery (ST01, ST04, ST06), while primary prevention content is already included in health promotion material for patients (e.g. calendar, DOC44) and education resources for health professionals (e.g. flip chart, DOC42) produced by the Activity (DOC8C).

4.5.3. Output 5 did not meet expectations in terms of impact, with no noticeable benefits yet realised for Fiji.

Across the interviews, few were aware of the guidelines and none noted any realised benefits in terms of the guidelines as yet; this result is unsurprising given the relatively recent release of the guidelines and the lack of primary prevention health promotion campaign.

4.5.4. Output 5 met expectations in terms of sustainability, as the available guidelines enabled primary prevention with plans in place to ensure ongoing buy-in.

It is expected that MHMS will continue to use and integrate the guidelines within the given capacity moving forward. Although early days, the guidelines provide evidence-based, clinically proven practices for Fiji. As noted above, the guidelines are available, and with sufficient health system capacity and overall awareness, they can enable primary prevention. Training is already planned, using the existing resource (i.e. divisional coordinators), demonstrating that Fiji is preparing to build awareness and use of the guidelines.

4.5.5. Further considerations for the primary prevention guidelines moving forward

The guidelines set standards relevant to Fiji, and it is important to ensure health professionals are aware of and comply with these standards. There are plans in place to support awareness and understanding. Just as done with the guidelines on best practice care, the Activity provided training to Year 5 medical students at Fiji National University, and Years 5 and 6 medical students at the University of Fiji, and this is planned to be formalised within the curriculum. It was further reported that the review cycle for the guidelines has been planned.

Nevertheless, barriers moving forward include:

1. **Capacity:** (as noted in 4.2.4) training is limited insofar as there are few trainers and they have little available capacity; use of guidelines requires sufficient capacity across the health system to learn and put these into practice; ongoing review cycles are important to ensure the recency of the guidelines in line with current research practice and needs, and this requires capacity and specific capabilities; considering the impact of primary prevention on the broader health system, capacity to address the potential demand will be key.

Recommendations to further enable the success relevant to the primary prevention guidelines are provided below.

Table 7: Recommendations to enhance achievement from the guidelines

Findings	Recommendation
	Secure the required capability for the working group to conduct regular reviews of the guidelines.
Limited capacity	Consider strategies to enhance training capacity, and continue training current health

[27] Health promotion activities are considered broadly in Output 4; however, it is important to note here that health promotion activities were planned and not delivered as part of the guidelines.

	practitioners as well as *future* health practitioner while formalising the guidelines into all relevant medical training curriculum.
	Consider the possible implications of primary prevention on the broader Fiji health system
No benefits realised for the Fiji population	Assess adherence to the guideline recommended practices, identifying gaps in practice and share these results with current practitioners.

4.6. Overall approach and structure of the Activity

The Activity designed and delivered outputs relevant to controlling RHD in Fiji, developing systems and human resource capacity across the health system across the five outputs summarised above. These overarching activities are summarised here.

4.6.1. The partnership approach with the Fiji Government, and the associated activities, promoted a local commitment and ownership to the activity moving forward (sustainability).

Taking an inclusive, partnership approach enables development outcomes by empowering the people it seeks to help, while local ownership promotes sustainability beyond the funding period. The Activity prioritised activities around achieving sustainable outcomes across the Fiji health system, and as such, partnership with central government was believed vital to their success.

As noted by the WHO regarding RF and ARF prevention and control:

> *"to ensure sustainability, these programmes should be integrated in national health development plans and delivered through the existing national infrastructure of the health ministries (including units concerned with women's, children's and adolescents' health and noncommunicable diseases) and education ministries, avoiding the establishment of a new administrative or delivery frameworks*."[28]

The partnership approach was evident across all aspects of the Activity, from developing and gaining agreement on the plan to designing and delivering on the outputs. The evidence demonstrated a clear objective to encourage local ownership through partnership with the in-country government (DOC3, ST06, ST13, SS2):

- Funding was provided by both overseas donors (Cure Kids and MFAT) and the in-country government (Fiji MHMS), with a defined transition-out strategy and increasing funding coming from MHMS over the five-year period.
- Decisions were made collectively, and for example, recruitment was decided and managed by the MHMS human resource department.
- A programme owner within MHMS was identified and confirmed.
- Staff were located within the MHMS building and structure, with Cure Kids staff being seconded to MHMS during the Activity; and capacity building focused on the current workforce.
- Existing structures provided the platform for Activity outputs (e.g. RFIS sitting on the MHMS server; case detection).
- Existing in-country agencies, such as the Fiji Ministry of Education and Fiji Pharmaceutical & Biomedical Services, and environment were considered when delivering activities that were expected to impact on the broader system (e.g. education, health and medicines, government budgets).

The RHD programme team also encouraged government commitment to RHD more broadly. For example, the team provided support towards Fiji MHMS sponsorship of the WHO resolution on rheumatic fever and rheumatic heart disease at the World Health Assembly in Geneva in 2018 (ST06, ST13, SS2). The resolution confirmed the urgent need to prevent and control ARF and RHD, and mandated the Fiji Government's commitment to address it.

The commitment from both the Fiji Government and MHMS are evident in recent decisions and actions taken by both. The Fiji Government allocated FJD150,000 in its 2019/20 budget for the RHD Prevention and Control

[28] WHO (12 April 2018), Rheumatic fever and rheumatic heart disease, seventy-first World Health Assembly, http://apps.who.int/gb/ebwha/pdf_files/WHA71/A71_25-en.pdf.

Program to "contribute to maintaining a high-skilled health workforce, trained in ARF and RHD diagnosis and management" (DOC61)[29].

Although the partnership approach and collaboration meant outputs and outcomes took longer to achieve than expected, these short-term outcomes were viewed as secondary, and sustainability of the work moving beyond the funded period.

4.6.2. Governance and leadership are required for ongoing sustainability

From the outset, the Activity's governance arrangements were designed to provide active direction, periodically review interim results and reports, and identify and execute adjustments to ensure achievement of the Activity's outcomes. During the period of grant funding, the Activity steering group provided additional advisory and oversight of the Activity, supporting MHMS capacity (ST02, ST04, ST06, ST12). More specifically, the function of the group was to monitor and make decisions in handling delivery, political, organisational, technical, cost, management, cultural, and sustainability issues (DOC13).

The group worked with the Activity through the MHMS National Technical Advisory Committee (TAC). TAC met regularly during the Activity, and administration for the group was intended to be provided by the (currently unfilled role of) national RHD coordinator. TAC contributes to ensuring ongoing governance and oversight of RHD efforts and a multi -stakeholder approach reflecting (in its membership) different levels and domains of care and service. The group was viewed by several stakeholders as key to ongoing guidance and decision making moving forward, and the provided high-level support, technical guidance and governance was viewed as crucial for future sustainability of the Activity (SS1, ST13). However, the future of the governance structure is unclear, and there remains a risk that the Activity will not be sustained without clear guidance and direction. The evaluation therefore recommends:

Table 8: Recommendations to enhance achievement of the Activity (governance)

Findings	Recommendations
Unclear governance structure moving forward	1. Clarify role and composition of TAC within MHMS moving forward. 2. Ensure TAC is actively engaged during the end of the Activity transitional phase, and there is active governance on an ongoing basis to help ensure sustainable outcomes are achieved, and technical support is provided (e.g. review of guidelines, accountability).

[29] MHMS funding allocation does not include the salaries of the District Coordinators nor the National Coordinator.

5. Summary and Conclusions

To assess the performance of the Activity, each output was given a weighting, and this weighting estimated the perceived value of each output towards reducing ARF/RHD morbidity and mortality in Fiji (c.f. Section 3). These weighted values, assigned by the Steering Group, were:

- high value, shown below as large bubbles (e.g. register-based programme and health promotion activities)
- medium value, shown below as mid-sized bubbles (e.g. the best practice guidelines)
- low value, shown below as small bubble (e.g. early case detection programme and primary prevention guidelines).

The evaluation team found that the Activity was worthwhile in delivering activities that work towards reducing ARF/RHD morbidity and mortality in Fiji. Figure 14 below shows the greatest weighted achievement was sustainability, followed by relevance, effectiveness, and then impact.

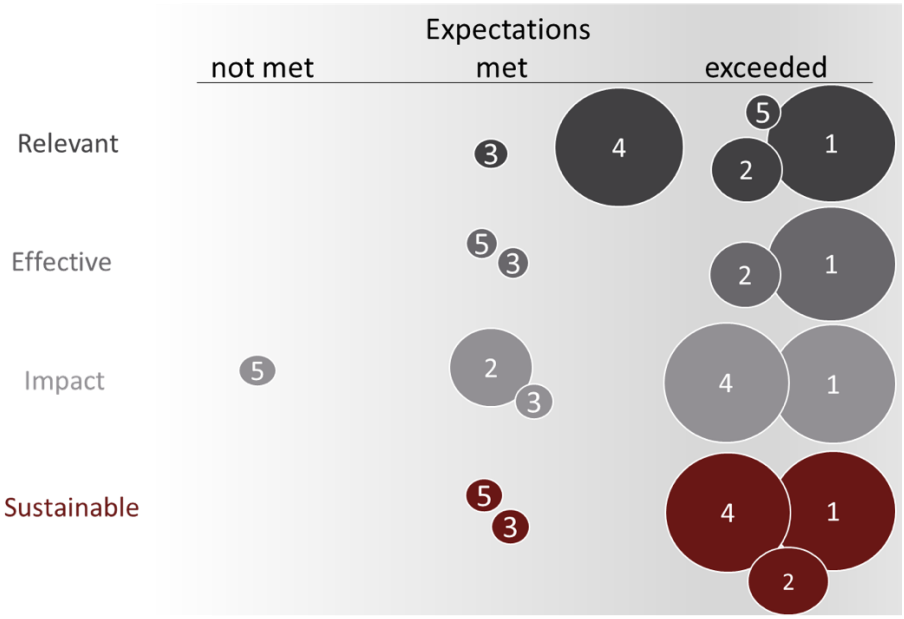


Figure 14: Overall assessment of the Activity, highlighting achievements according to the weighted value of each output towards reducing ARF/RHD morbidity and mortality in Fiji ("1" refers to the national register-based secondary prevention programme; "2" refers to the best practice guidelines for the clinical care of patients with ARF/RHD; "3" refers to the model for RHD early case detection; "4" refers to the health promotion activities; "5" refers to the primary prevention guidelines).

The Activity was relevant to Fiji's context and needs.

The Activity aligned well with the overall health system and the local context in order to address RHD in Fiji. In particular, the register-based programme and the best practice clinical guidelines flawlessly integrated into the existing services across all tiers of service, and support groups and other related activities were relevant to PLWRHD. The guidelines are easily accessible and relevant to Fiji, enabling access irrespective of the context many health practitioners find themselves in (such as lack of computer hardware and internet). The echo-screening programme aligned to the local needs, but was limited insofar as capacity to reach the population of Fiji and detect cases of RHD early, as well as low adherence rates to secondary prophylaxis impacting of the ability to improve health outcomes for those diagnosed through screening. Nevertheless there are plans in place to address these limitations. The resources designed for health promotion encompass clear and simple messages supported by catchy narrative cartoons that demonstrate messages and people relevant to Fiji. They are used widely by practitioners and enable task-shifting (demonstrating the relevance for the health sector). There was insufficient evidence to determine if there were gaps in the messages or reach of the population, as well as gaps in understanding of the specified target markets (from the evidence provided). Primary

prevention has been designed to promote best practice within the Fiji context and has been integrated into the downloadable app to enable uptake given the noted barriers (e.g. internet connectivity, equipment) in Fiji.

The Activity was effective

The World Health Organisation suggests that the "most successful GAS control activities have combined strategies including primary prophylaxis, treatment of skin infections, health promotion, secondary prophylaxis and RHD registers"[30]. The Activity aligns well with 'what works', and the outputs serve as enablers to the overall health system to address RHD in Fiji.

All outputs mostly or fully achieved what was planned in terms of output delivery, quality and demonstrated uptake. The activities related to register-based programme are contributing to improved adherence rates, and enabling the planning and provision of the required medicines and treatment of RHD. The guidelines not only showed achievements of outcomes, but also broad acceptance, trust and reference to them, as well as demonstrated understanding of the key changes brought about. Further, initial indications suggest that the echo-screening programme is resulting in early diagnosis of RHD. Apart from numbers of RHD diagnosed, it was expected that having additional early detection capability will enable earlier identification of less severe RHD; this achievement could not be determined with the current data. The register-based programme is also demonstrating significant success in terms of achieving improved rates of secondary prophylaxis. Access remains an issue for some for RFIS to expand beyond the expected uptake, whereas system capacity is serving as the barrier to wider echo screening (rather than auscultation) and the relatively late release of the guidelines has delayed any realised outcomes towards an effective register-based programme.

The Activity was sustainable

The inclusive partnership approach and support has, in some cases, affected the deliverable timelines but had ensured an enduring commitment that will live beyond the funded period (ending in 2019). There have been significant wins for the sustainability, including but not limited the secured budget increase for addressing RHD in Fiji in addition to MHMS positions, and the ratification of the WHO resolution and Fiji's commitment to it. The Activity has also made progress towards integrating ARF and RHD services into all aspects of the health system (as set out in the national RHD policy). These collective factors will be key to maintaining the progress made by the Activity moving forward.

Through the outputs, the Activity provided critical foundations for Fiji's health system around ARF and RHD. There is a clear commitment and expectation that the register-based programme and both guidelines will continue across all tiers of service now that they are integrated into the system, with staff secured to support this ongoing training as well as plan to integrate training into current medical school curriculum. Further buy-in and awareness is required to ensure primary prevention is sustainable within the given context. There is also the expectation to continue meeting echo-screening needs, and a plan in place to build the required capacity. The combination of targeted training (including both nurses and medical officers), the inclusion of the community (through community health workers and support groups) and the provision of resources are all supporting the sustainability of health promotion among the population. Further ongoing specialist resourcing would be required to ensure this health promotion can be maintained.

[30] World Health Organization. A Review of the Technical Basis for the Control of Conditions Associated with Group A Streptococcal Infections. Geneva: World Health Organization; 2005., pg. v.

The Activity demonstrated impact, and some broad benefits for Fiji

The Activity had resulted in some significant and broad benefits for Fiji. The design and management of RFIS helped understand and respond to needs in relation to RHD, ensuring the health system is able to more effectively and consistently trace and treat RHD patients, towards reducing morbidity. The guidelines are beginning to change the way health practitioners work together and the echo screening is having an effect on targeted groups (school children in Suva), but these are occurring in small pockets at this stage. There is emerging evidence relevant to the impact of the health promotion activities and primary prevention guidelines, but these are not yet realised (or evidenced) across the population and health system.

6. LESSONS LEARNED

Partnership approach, weaving together key technical experts, capacity support and local staff within the delivery and established structures of the Fiji Ministry of Health was a key contributor to the overall success of the Activity.

Status and respect are key in Fiji, and working within these values is essential to navigate change. The Activity sought to enable an existing system and used a strategic and sustainability-conscious approach which focused on partnership and cooperation with the Fiji Government. The approach demonstrated clear examples of inclusive partnership approach, weaving together support and capacity into existing services[31]. MHMS and other local stakeholders had embedded roles in the design and implementation of activities towards outputs. MHMS staff, systems (including IT systems) and decisions have shaped the Activity. The partnership set up staged transition of funding, ownership and responsibilities from Cure Kids to the MHMS over the course of the Activity with the goal of MHMS's ownership of the outputs and the Activity. This approach has proven highly successful, albeit challenging in terms of delivery timelines, integrating the activities within the existing system and ultimately enabling sustainability moving forward.

Technical expertise alongside contextual knowledge holders supported the delivery from the outset. What was notable was the strong relationship between the researchers (originally formed as part of GrASP) and the delivery teams, with experts and practitioners often being one in the same. Publications and presentations were delivered and staff were invited to speak at international forums (e.g. WHO Forum on RHD), placing Fiji firmly on the international stage in terms of RHD control and prevention (see section 4.5). The best practice was woven into the local context, building upon the relevant expertise and existing systems. Staff were invited to speak at international forums. The integrity, relevance and international attention was believed to promote focus on RHD within Fiji.

7. RECOMMENDATIONS

The following recommendations are provided to further enhance ARF/RHD control and prevention in Fiji through the established outputs. The recommendations are expected to be considered by the Activity's Governance Group, as part of the broader activities, system and capacities. Cost estimates and timelines are provided as considerations only, and roles and responsibilities to implement any agreed recommendations would be the responsibility of the Governance Group to assign. A management response (Appendix 5) is provided to support this process.

[31] OECD. (2014). Inclusive development partnership. In Making development co-operation more effective: 2014 Progress Report. Paris: OECD, UNDP

Table 9: Recommendations based on the evaluation evidence. Relative cost estimates and timelines (where possible) are indicative only.

Findings	Recommendation	Likely cost	Immediate	Year 1	Year 2-3	Year 4+
Unclear governance structure moving forward	1. Clarify role and composition of TAC within MHMS moving forward	-				
	2. Ensure TAC is actively engaged during the end of the Activity transitional phase, and there is active governance on an ongoing basis to help ensure sustainable outcomes are achieved, and technical support is provided (e.g. review of guidelines, accountability).	$				
Register-based programme						
Constrained capacity; Accuracy and recency of data	3. Make RFIS available to more health facilities, first focusing on those facilities with internet connectivity and computers, and then planning for greater roll out.	$$$				
	4. Transition practitioners to record and monitor patient information directly on the web-based platform, including updating patient contact details, (preferred) health facility and treatment information while the patient is present.					
Constrained capacity	5. Modify RFIS to automatically flag duplicate patient data (for checking) or similar patient data (to verify).	$$				
Lack of trust in and use of data	6. Modify reporting to include adherence rates for all patients for each facility to reflect on-the-ground experiences (i.e. monthly adherence rates) as well as clinical success (80% compliance).	-				
	7. Consider changing calculation of monthly adherence rates to rolling totals rather than statistics based on fixed quarters or years.	-				
Constrained capacity	8. Modify RFIS so reporting allows practitioners to monitor individual patient's adherence (for tracing) and overall success relevant to their facility as well as nationally, at any point.	$$				
Constrained capacity	9. Consider strategies to provide greater support and capacity should be directed to poor performing facilities (those with lowest compliance).	$$				
Guidelines (output 2 and 5)						
	10. Secure the required capability for the working group to conduct regular reviews of the guidelines.	$				
Limited capacity	11. Consider strategies to enhance training capacity, and continue training current health practitioners as well as future health practitioner while formalising the guidelines into all relevant medical training curriculum.					
	12. Consider the possible implications of primary prevention on the broader Fiji health system					
Few realised broad benefits (to date) for Fiji	13. Assess adherence to the guideline recommended practices, identifying gaps in practice and share these results with current practitioners.	$$				
Early case detection programme						
Limited capacity to diagnose and counsel	14. Consider strategies necessary to enable training greater numbers of health practitioners and community workers to recognise symptoms of ARF and RHD; and greater numbers of health practitioners, in particular nurses, to undertake echo screening to identify RHD, in particular in regions where there is limited capacity.	$				
	15. Secure capacity required to work with patients, particularly at diagnosis stage.	$$$				
Significant distances	16. Once secondary prophylaxis rates are reasonable, procure additional portable machines, and ideally machines that can either record or print images.	$$$				
Few realised broad	17. Once secondary prophylaxis rates are reasonable, consider broadening the pilot to include further schools, and greater	$$$				

Findings	Recommendation	Likely cost	Immediate	Year 1	Year 2-3	Year 4+
benefits (to date) for Fiji	numbers of classes and ages being screened while already at the school.					
	18. Consider prioritising echo screening for vulnerable communities (i.e. pregnant women, communities with poor housing) and how to implement a broader open-door policy to echo screening (i.e. open days, RHD hub).	-				
Health Promotion						
Limited capacity	19. Consider how to maximise existing structures to convey messages to the populations (e.g. adding messages into the education curriculum), and develop materials to support local use of resources, and identify opportunities within the community (e.g. church groups, community leaders) to expand on reach with limited capacity.	$				
	20. Strengthen PLWRHD organisational support, and PLWRHD must be central all program activities going forward.	$				
	21. Consider procurement to acquire relevant marketing skills to understand and further expand on the existing campaign					
Few broad benefits (yet realised) for the Activity	22. Following recommendation 21, undertake market research to understand motivators to change behaviours towards the desired behaviour, and identify and define segments of the at-risk audience groups (language, age group, location) and how best to reach them (messages, modes of communication, source and images of the messages, posters, child sticker calendars).	$$$				
	23. Following recommendation 21, undertake market research to evaluate specific aspects of the current campaign in terms of reach and effectiveness.					
	24. Following recommendation 21, design and deliver a health promotion campaign to maximise the impact of the money spent on campaign design and delivery, while promoting behaviour change in terms of antibiotic adherence as well as early identification of symptoms.					

Fiji Rheumatic Heart Prevention and Control Program

Project Brief/Terms of Reference

Project Title	Fiji RHD Prevention and Control Program
Final deliverable date	By June 30, 2019
Key Deliverable(s)	Evaluation Report
Location(s)	Home based with at least one in-country (Fiji) visit (various locations)
Evaluation sponsor	Cure Kids New Zealand

Reports to	Mr Tim Edmonds/Liz Kennedy

Background

Acute Rheumatic Fever (ARF) and Rheumatic heart disease (RHD) causes a significant burden of disease in Fiji. Nearly 1% of all Fijians have evidence of RHD, with confirmed prevalence of RHD in school-aged children estimated at 8.2 per 1000 population[32].

The MFAT/MHMS/Cure Kids funded Activity aimed to facilitate the expansion and strengthening of the existing Fiji Rheumatic Heart Disease (RHD) Control Programme; providing new models of Acute Rheumatic Fever (ARF)/RHD care and prevention. The Activity has four key outputs which together aim to contribute to improved ARF/RHD control in Fiji comprising;
(1) a national register-based secondary prevention programme
(2) best practice guidelines for the clinical care of patients with ARF/RHD
(3) a model for RHD early case detection including a national echo screening programme (4) ARF primary prevention and health promotion strategy

These components are recognised as necessary for successful ARF/RHD control[33] and each output has a number of associated activities.

The Activity aimed to facilitate co-ordination of all ARF/RHD activities under the strategic direction of the MHMS, integration into existing services and models of care, and development of new models of care with the aim of creating sustainable and effective ARF/RHD control in Fiji.

The desired long-term goal of the Activity is to contribute to a reduction in ARF/RHD morbidity and mortality through reducing RHD prevalence and ARF incidence.

---

[32] Colquhoun S, Kado J, Remenyi B, Wilson N, Carapetis J, Steer A. Cardiology in the Young. 2014
[33] Jackson C and Lennon D. Rheumatic Fever Register: Scoping the Development of a National Web-Based Rheumatic Fever Register. (2009) Auckland. New Zealand Ministry of Health

The four year, *plus one year extension,* Activity *officially commenced* in *June* 2014 with activities *commencing in November 2014.* Activity partners are the Fiji Ministry of Health (Fiji RHD Control Program) and Cure Kids (Fiji). The Activity lead is Cure Kids (NZ) with the Auckland District Health Board, Murdoch Children's Research Institute Fiji Group A Streptococcal Project [Fiji GrASP] and Counties Manukau District Health Board as key partners.

Scope

Cure Kids is looking to commission a process and outcome evaluation of the Fiji Rheumatic Heart Disease (RHD) Control Programme to specifically understand the enablers and barriers to establishing the programme as well as the impact of the work that has been undertaken.

The RHD Program has been monitored over the past five years via short and medium term indicators associated with each of the aforementioned programme components. There is information and data available about the key aspects of the programme that the evaluation team will be able to use to answer the key evaluation questions (see data sources below). In addition to analysing existing data, key informant interviews will be need to be undertaken to gain insights into process aspects of the programme.

In partnership with the Fiji MHMS, we are seeking to recruit a consultant to conduct a Program evaluation. This includes:

a. Confirm the key evaluation questions in discussion with the evaluation steering group (using OECD-DAC evaluation criteria to measure effectiveness, impact and sustainability of the program as a basi and evaluation framework

b. Developing an evaluation plan (using MFAT template) which will highlight the evaluation approach and design, and considers a mix of the following methodologies. It will also reflect on stakeholders and evaluation utility:

   - Key literature and document review
   - Conducting key informant interviews
   - Analysing all activity level data for the past four year
   - Consolidating and triangulating all available and gathered qualitative and quantitative data

c. Presenting to the steering group on initial findings

d. Using MFAT templates completing a draft evaluation report for review and a two pager insights document

e. Finalising the Evaluation report complete with recommendations

Key Deliverables

The key deliverables will be an evaluation plan, a presentation on initial findings, a complete and comprehensive Program Evaluation report and a 2 pager insights document.

Key advisors to the Program including Steering Group members

i. Associate Professor/Dr Joseph Kado – Fiji National University/Paediatrician (Chair, Activity Steering Group)

ii. Dr Isimeli Tukana– Head of Wellness Unit, Ministry of Health and Medical Services

iii. MFAT representatives (M&E Advisor)

iv. Ms Liz Kennedy, Cure Kids New Zealand (Suva based)

v. Mr Tim Edmonds, Cure Kids New Zealand

vi. Dr Sai Boladuadua, Cure Kids New Zealand (Suva based)

vii. Ms Maria Mow, Cure Kids New Zealand (Suva based)

viii. Ms Laisiana Matatolu, Scientific and Technical Support Officer (STSO/data officer)

ix. Dr Nigel Wilson, Starship Hospital

x. Dr Andrew Steer, Murdoch Children's Research Institute (MCRI)

xi. Dr Pip Anderson, Counties Manukau District Health Board

xii. Ms Erini Tokarua, community engagement officer

Activities/ Tasks	Number of days	Deadline
1. Develop and confirm key evaluation questions		April 29
2. Develop evaluation framework rubrics and plan and share with steering group, along with key evaluation questions.		April 29
Collation and preliminary analysis of existing program data /reports		May 6
3. Key informant interviews and consolidate available data – in-country		May 27
4. Analysis and triangulate all data including latest available adherence data		June 13
5. Presentation on initial findings		June 17
6. Submit complete **draft report and two page insights report** for review		June 22
7. Finalize Evaluation Report and obtain endorsement from the Steering Groups		June 30

Key sources of data available

- Situation Analysis report (2014) – background document
- Annual donor reports including risk matrix
- Monthly Divisional Coordinator reports
- Annual MHMS activity updates
- Baseline Knowledge, Attitude and Practices Survey report (health worker)
- Baseline Knowledge, Attitude and Practices Survey report (community)
- KAP follow up study report for community (linked to Output 4)
- Activity tracking document
- Adherence to secondary prophylaxis reports
- Pre and post training tests (some of which are collated)
- School screening pilot report and associated data
- Mid-term Review of the Impact of RHD Training for Nurses
- Patient feedback forms (not collated) – post support group activities (qualitiative)
- Data specifications document for the Rhuematic Fever Information System (RFIS)

Key sources of data available

- Phase 1 and phase 2 echo workforce development reports
- Steering Group Minutes

Evaluation Steering Group

The Steering Group and operational advisor will meet three times over the course of the evaluation:

Meeting 1: MFAT and Cure Kids representative to meet and discuss short list applicants

Meeting 2: Following selection of the consultant to discuss scope of work and expectations, general planning

Meeting 3: Mid point touch base (e.g. while in country – ensure process on track

Meeting 4: Evaluation consultant to present on initial findings and feedback

Inputs

The Project Steering Group and operational advisor will be responsible for:

- Briefing the consultant; and providing guidance and feedback as required.
- Arranging and facilitating times and places for interviews / meetings/ workshops;
- Facilitating access to appropriate databases and records at health facilities if so requested to strengthen the evidence base;
- Providing appropriate workspace, internet and phone access during the inc-country visit

APPENDIX 2: INTERVIEW GUIDE (TEMPLATE)

The following interview guide demonstrates question prompts addressing the key evaluation questions, and was adapted for each stakeholder depending on their relationship and relevance to each output. The high-level questions that guided the discussions are set out below.

The protocol included introductions, sharing the information sheet, addressing any questions and reviewing/signing the consent form, as well as providing contact details if there are any questions or concerns.

1. Can you briefly tell us what your relationship is with the RHD control and prevention programme?

2. What was the context of ARF/RHD in Fiji before the programme?

3. In your experience, what progress has been made in delivering the intended outputs? Has this progress been documented / Can you show us any of the outputs?

4. How do you or your staff use the outputs? (probe to RFIS, guidelines, echo-screening, health promotion, guidelines)

5. In the past four years, have you witnessed these outputs contribute to any changes in ARF incidence and RHD prevalence? (what did you witness / how do you know)?

6. Any other changes (capability, sense of community)?

7. In the past four years, have you witnessed any unintended /unexpected / surprising outcomes?

8. What factors enabled or hindered progress for the RHD programme (internet, systems, capability, infrastructure, costs, relationships)?

9. How would you know if the local systems and capacity are able to carry forward the delivery of the Activity? Do you see any of this evidence? Anything missing? Probe to: Commitment of government / expectations of staff; Dedicated positions and local leadership

10. What are your expectations in terms of the current/ future of the programme (probe to RFIS, guidelines, echo-screening, health promotion, guidelines)

11. Do you have any recommendations to improve the activities and reduce rates of RF and RHD in Fiji?

APPENDIX 3: DOCUMENTS PROVIDED BY CURE KIDS

The initial documents provided by Cure Kids will support the answering of the evaluation questions. Documents will be added to the list as the evaluation progresses.

	Document	Year
DOC1	Results Measurements Table – Baseline	2014
DOC2	Situational report	2014
DOC3	Project design document	2014
DOC4	RHD Global Status Report 2015-17	2016
DOC5	Project logic documents (PP format)	2016
DOC6	Main Programme monitoring tracking document	2016-19
DOC7	Monitoring and evaluation matrix	2015
DOC8 A-D	Annual reports to donor (MFAT)	2015, 2016, 2017, 2018
DOC9	Technical update	2016
DOC10	Global RHD resolution	2018
DOC11	Conference abstracts (published)	2017
DOC12	Speech, Minister for Health and Medical Services	2017
DOC13	Steering group ToR	2015
DOC14 A-B	Steering group minutes	2015, 2016
DOC15	Proposal/s for establishment of permanent RHD positions within the MHMS	2016
DOC16	NHEC memorandum	2016
DOC17	Baseline report – "Exploring system-level barriers to improved patient adherence (to secondary prophylaxis)."	2015
DOC18	Baseline report "To evaluate health care system barriers to delivery of effective clinical care to inform development of best practice Fiji specific ARF and RHD clinical management guidelines."	2015
DOC19	Sustainability and Integration Plan	2015
DOC20	Draft Engagement Strategy	2015
DOC21	Example of Divisional Coordinator monthly reports	2018
DOC22	RFIS overarching document	Not specified
DOC23	RFIS specifications document	2015
DOC24	Fiji Island Rheumatic Fever Register Briefing Paper – Steering Group	2015
DOC25	Example of Divisional Coordinator monthly reports II	2017
DOC26	WHO: A Review of the Technical Basis for the Control of Conditions Associated with Group A Streptococcal Infections	2005
DOC27	Rheumatic Fever Information System – sub-contract	2016
DOC28	Data manager position description	2014

DOC29	Benza update – letter to director of FPBS from RHD Program	2016
DOC30	Launch schedule for 'Take your Benza…. Even if you feel well' campaign / Minister launch speech	2016
DOC31	Terms of reference – RHD liaison role	2016
DOC32	Sore throat and skin disease and treatment clinical guidelines	2018
DOC33	Information from scoping exercise for output 2.2	2015
DOC34	Mid-term review of health professional training	2017 (possible)
DOC35	Post-support group patient feedback form	2016 - 2019
DOC36	Community health worker training manual	2017
DOC37	Screening-detected rheumatic heart disease can progress to severe disease (Echo follow up study)	2016 (possible)
DOC38	Phase 1 echo training report	2016
DOC39	SG discussion paper "Fiji MoHMS / CK RHD Control Programme"	Not specified
DOC40	Nurse-led echo (in schools) proposal	2017
DOC41	Conference posters	2016
DOC42	Nurse educational flip chart	2018
DOC43	Fiji Health Professionals Knowledge, Attitude and Perception Survey Report	2016
DOC44	RHD Calendar for patients and carers	2017, 2018
DOC45	Baseline report – KAP Survey (sample 400)	2016
DOC46	Standard Operation Procedure for gathering follow up data from non-health professionals (Community)	2019
DOC47	Outline of campaign	Not specified
DOC48	Business case RHD programme 2019/20 budget Fiji	2019
DOC49	Mass media national activities tracking sheet	2017-2019
DOC50	FPBS stock transfer list	2015-2019
DOC51	RHD / ARF notifications	2015-2019
DOC52 A+B	RFIS Bugs and changes	2018, 2019
DOC53	RFIS entries	2019
DOC54	Ministry allocations 2019/20 National Budget	2019
DOC55	National RHD Policy	2015
DOC56 A+B	Pre and post nurse training feedback forms	2016 - 2019
DOC57 A-N	Nurse training materials	Not specified
DOC58	Community health worker training	Not specified
DOC59 A-C	Notifiable disease report	2015, 2018, 2019
DOC60	Community health worker awareness package	2018
DOC61	Fiji Government 2019-20 budget highlights	2019
DOC62	Fiji guidelines for Acute Rheumatic Fever and Rheumatic Heart Disease Diagnosis, Management and Prevention	2017

APPENDIX 4: EVALUATION RUBRICS

The evaluation needed to make judgements about performance of the Activity. The following ratings were used to guide judgement on the worth of each output. Each output is given a weighting, and this weighting estimates *the perceived value of each output towards reducing ARF/RHD morbidity and mortality in Fiji.*

The qualitative weight allowed the team to make objective views about the overall worth of the Activity. No judgement will be made if there is insufficient evidence available.

Activity component: *weighted value*	Did not meet expectations	Met expectations	Exceeded expectations
Output 1: ***high value***	The output was flawed in terms of alignment, or the setting was not right at the time (relevant). Output not achieved or advanced. Unresolved challenges with no plan to address them (effective). The output cannot continue in its current form; no commitment, funding or capability to ensure the work will continue (sustainable). No noticeable benefits for Fiji; negative impact on the intended users and beneficiaries (impact).	RFIS was mostly integrated into systems, processes and services, with any misalignments easily accommodated by the system or staff. Expected outputs and outcomes achieved, or clear plans to address any unresolved challenges. Expectation to continue RFIS, and a plan in place to build the required further buy-in for ongoing sustainability. No (or few) positive unintended benefits for Fiji; any negative unintended outcomes are able to be resolved.	RFIS development and output aligned with local health systems and processes, flawlessly integrating into the existing services across all tiers of service. Output achieved better than originally planned in terms of quality and demonstrated uptake and use of RFIS. All aspirational results measurement table (RMT) targets met or exceeded, and expected outcomes achieved or exceeded. Demonstrated ongoing commitment to output across all tiers of service. Local ownership of output provision is planned, and broad and consistent expectation that the output will continue to be used. Significant positive unintended and broad benefits for Fiji.
Output 2: ***moderate value***	As above	Guidelines mostly aligned, with any misalignments easily accommodated. Expected outputs and outcomes achieved, or clear plans to address any few unresolved challenges. Expectation to continue capacity development to manage and prescribe Benzathine, and a plan in place to build the required further buy-in for ongoing sustainability. No (or few) positive unintended benefits for Fiji; any negative unintended outcomes are able to be resolved.	Guidelines aligned to Fiji systems and people; easily understood and integrated the practices of all relevant staff, with no significant challenges. Output achieved better than originally planned in terms of quality and demonstrated improvement to management and prescribing Benzathine. All RMT targets met or exceeded, and expected outcomes achieved or exceeded. Demonstrated commitment across the system to sustain workforce capacity, and ability to ensure quality of management and prescriptions. Significant positive unintended and broad benefits for Fiji.
Output 3: ***low value***	As above	Output mostly aligned, with clear plans to address any misalignments. Expected outputs and outcomes achieved, or clear plans to address any few unresolved challenges. Expectation to continue meeting echo-screening needs, and a plan in place to build the required further buy-in for ongoing sustainability. No (or few) positive unintended benefits for Fiji; any negative unintended outcomes are able to be resolved.	Echo-screening process and output aligns local capacity needs, with no gaps. Output achieved better than originally planned in terms of quality and demonstrated improved capacity to carry out screening. All RMT targets met or exceeded, and expected outcomes achieved or exceeded. Demonstrated integration of capacity and machines, and ability to ensure continued use. Significant positive unintended and broad benefits for Fiji.

Output 4 (awareness raising): ***high value***	As above	Messages aligned and relevant to Fiji; gaps in messages, but plans are clear to address these. Expected outputs and outcomes achieved, or clear plans to address any few unresolved challenges. Expectation to continue primary prevention and health promotion messages, and a plan in place to build the required further buy-in for ongoing sustainability. No (or few) positive unintended benefits for Fiji; any negative unintended outcomes are able to be resolved.	Primary prevention and health promotion messages align to Fiji's context, with no gaps in provision of messages to key beneficiaries. Output achieved better than originally planned in terms of quality and uptake of health messages. All RMT targets met or exceeded, and expected outcomes achieved or exceeded. Demonstrated long-term commitment to health messages. Significant positive unintended and broad benefits of health promotion messages for Fiji.
Output 5 (primary prevention): ***low value***	As above	Primary prevention approach aligned and relevant to Fiji; gaps in delivery, but plans are clear to address these. Expected outputs and outcomes achieved, or clear plans to address any few unresolved challenges. Expectation to continue primary prevention, and a plan in place to build the required further buy-in for ongoing sustainability. No (or few) positive unintended benefits for Fiji; any negative unintended outcomes are able to be resolved.	Primary prevention align to Fiji's context, with no gaps in provision of messages to key beneficiaries. Output achieved better than originally planned in terms of quality and delivery. All RMT targets met or exceeded, and expected outcomes achieved or exceeded. Demonstrated long-term commitment to primary prevention. Significant positive unintended and broad benefits of health promotion messages for Fiji.

APPENDIX 5: MANAGEMENT RESPONSE

Report recommendations	**Response** (agree, partially agree, reject) and **Action**	**Responsibility** (who is responsible for the action)	**When**
1. Clarify role and composition of TAC within MHMS moving forward	**Agree.** In principle we agree …. **Action** The Group will ...		
2. 2.Ensure TAC is actively engaged during the end-of-Activity, transitional phase, and active governance on ongoing basis to help ensure sustainable outcomes are achieved.			
3. Make RFIS available to more health facilities, first focusing on those facilities with internet connectivity and computers, and then planning for greater roll out.			
4. Transition practitioners to record and monitor patient information directly on the web-based platform, including updating patient contact details, (preferred) health facility and treatment information while the patient is present.			
5. Modify RFIS to automatically flag duplicate patient data (for checking) or similar patient data (to verify).			
6. Modify reporting to include adherence rates for all patients for each facility to reflect on-the-ground experiences (i.e. monthly adherence rates) as well as clinical success (80% compliance).			
7. Consider changing calculation of monthly adherence rates to rolling totals rather than statistics based on fixed quarters or years.			
8. Modify RFIS so reporting			

allows practitioners to monitor individual patient's adherence (for tracing) and overall success relevant to their facility as well as nationally, at any point.			
9. Consider strategies to provide greater support and capacity should be directed to poor performing facilities (those with lowest compliance).			
10. Secure the required capability for the working group to conduct regular reviews of the guidelines.			
11. Secure the required capability for the working group to conduct regular reviews of the guidelines.			
12. Consider strategies to enhance training capacity, and continue training current health practitioners as well as future health practitioner while formalising the guidelines into all relevant medical training curriculum.			
13. Consider the possible implications of primary prevention on the broader Fiji health system			
14. Assess adherence to the guideline recommended practices, identifying gaps in practice and share these results with current practitioners.			
15. Consider strategies necessary to enable training greater numbers of health practitioners and community workers to recognise symptoms of ARF and RHD; and greater numbers of health practitioners, in particular nurses, to undertake echo screening to identify RHD, in particular in regions where there is limited capacity.			
16. Secure capacity required to work with patients, particularly at diagnosis stage.			
17. Once secondary prophylaxis			

rates are reasonable, procure additional portable machines, and ideally machines that can either record or print images.			
18. Once secondary prophylaxis rates are reasonable, consider broadening the pilot to include further schools, and greater numbers of classes and ages being screened while already at the school.			
19. Consider prioritising echo screening for vulnerable communities (i.e. pregnant women, communities with poor housing) and how to implement a broader open-door policy to echo screening (i.e. open days, RHD hub).			
20. Consider how to maximise existing structures to convey messages to the populations (e.g. adding messages into the education curriculum), and develop materials to support local use of resources, and identify opportunities within the community (e.g. church groups, community leaders) to expand on reach with limited capacity.			
21. Strengthen PLWRHD organisational support, and PLWRHD must be central all program activities going forward.			
22. Consider procurement to acquire relevant marketing skills to understand and further expand on the existing campaign			
23. Following recommendation 21, undertake market research to understand motivators to change behaviours towards the desired behaviour, and identify and define segments of the at-risk audience groups (language, age group, location) and how best to reach them (messages, modes of communication, source and images of the messages, posters, child sticker calendars).			

24. Following recommendation 21, undertake market research to evaluate specific aspects of the current campaign in terms of reach and effectiveness.			
25. Following recommendation 21, design and deliver a health promotion campaign to maximise the impact of the money spent on campaign design and delivery, while promoting behaviour change in terms of antibiotic adherence as well as early identification of symptoms.			