P-10 Community Health and Disease Vector Management Plan

Aim and Objective

The purpose of **P-10 Community Health and Disease Vector Management Plan** (CHDVMP) is to protect the health, safety and wellbeing of the communities within the Project area. The plan also aims to control disease vectors and pests, namely mosquitoes and vermin. The specific objectives of the CHDVMP are to help reduce:

- exposure to communicable and vector borne diseases associated with the Project, taking in consideration differentiated exposure and the sensitivity of vulnerable groups
- exposure to hazardous materials and substances from the Project
- traffic related accidents as a result of the Project
- impacts associated with access to health services
- exposure to security related risks.

Summary of Impacts and Risks

Potential impacts on community health include:

- Noise and vibration
- Dust
- Hazardous materials
- Contaminated water
- Traffic hazards
- Influx of non-local people to the area consuming resources, using services, spreading vectors, pests and disease
- Spread of COVID-19
- Potential for increased vector habitat through storage of equipment, creation of ponds
- Personal security
- Sexual harassment, abuse and exploitation
- Increased demand on health services
- Benefits such as improved access to electricity, increased incomes, improved water supply.

Annex P-10-I Community Health Baseline Survey Report and **Annex P-10-II Community Health Context** provide a summary of the community health setting in which the Project is based.

Mitigation and Management Actions

#	Issue or Risk	Action	Timing / Frequency	Responsibility
P-10-1.	Cumulative impacts of the Project on households. Demand for resources due to in-migration and influx of non-local workers.	• Actions identified in **P-5 Influx Management Plan** (IMP) will mitigate impacts to some degree from influx of non-local people and families into local communities. • Actions identified in **P-4 Human Resources and Labour Management Plan** (HRLMP) for workers who visit local communities will help to limit harmful interactions with the local communities. • Actions identified in **C-7 Water Supply Replacement Plan** (WSRP) will ensure appropriate water resources and safe drinking water for the local community and households that have water supplies impacted by the construction activities. **M-2 Water Quality Monitoring Plan** (WQMP) will be implemented. • Actions identified in **C-13 Noise and Vibration Management Plan** (NVMP) will assist to reduce potential impacts from construction noise and vibration. • The differing needs of adults, children and people with special needs will be considered when implementing mitigation measures and/or corrective actions.	Throughout construction	HEC Construction Manager HEC HSE Manager
P-10-2.	Construction activities involving handling of soil and rock have potential to increase exposure to vectors for workers and communities; also potential for bacterial / fungal respiratory infection, exposure to toxic chemicals such as herbicides and pesticides (from historic land use, such as intensive cropping); and erosion and sedimentation impacting on water quality.	• The actions detailed in **C-9 Spoil and Topsoil Management Plan** (STMP), **C-3 Forest Clearance Plan** (FCP) and **C-4 Post-construction Rehabilitation and Revegetation Management Plan** (PCRRMP) will be implemented to eliminate or reduce contamination pathways by: – Minimising the time soils are exposed during construction. – Quickly in-fill and/or stabilise excavations following completion of construction activities, by planting and use of geotextile fabrics (where appropriate, as per **C-4 PCRRMP**). – Controlling access to open excavations, as per **P-7 Security Management Plan** (SMP) and **P-8 Workers' Health and Safety Plan** (WHSP), to minimise the risk that members of the public might come into contact with any contaminated soil that is disturbed). • Workers will be supplied with PPE such as gloves, protective clothing (long sleeves/trousers), eye protection and respiratory protection as required depending on the potential for contamination and level of risk, in accordance with the protocols outlined in **P-8 WHSP**. • Project-affected communities will be educated on the risks associated with the construction works, including the potential to be exposed to harmful substances. Awareness sessions will be conducted in accordance with community consultation protocols in **P-3 Stakeholder Engagement and Communications Plan**. • Records of soil excavation activities will be maintained including a checklist of contamination indicators. When soils are deemed to be contaminated, they shall be investigated and, if required, remediated or disposed of in accordance with good industry practice.	Throughout construction	HEC Construction Manager HEC HSE Manager HEC H&S Supervisor
P-10-3.	Increased risk to security and safety of locals due to construction activities and influx of non-locals.	Community access to the Project site and interaction with Project activities will be restricted by: • Implementing **P-7 Security Management Plan** (SMP) to ensure only authorised personnel are allowed onsite and in the Workers Accommodation Camp. • Implementing **P-11 Traffic Management Plan** (TMP) to manage traffic on access roads and transportation of machinery, goods and workers. • Installing two gates and Guard Posts, one at the core area and one at the workers camp, to limit non-Project access and ensure security measures to avoid trespassing. • Implementing warning signs at the perimeter of construction areas to notify public of hazardous areas. Guard rails will be installed on access roads.	Throughout construction	Construction Manager HEC HSE Manager HEC H&S Supervisor Security sub-contractor

		• All complaints and/or incidents relating to violence or sexual assault against minors will be referred to the Solomon Islands Police Force.		
P-10-4.	Potential contamination of water supplies may exacerbate current health conditions and result in increased number of people developing Typhoid or Hepatitis A, diarrhoea and gastrointestinal infections, and skin infections from contaminated water.	• Water supplies will be provided for villages where water supplies could be impacted by construction activities in accordance with **C-7 WSRP**. • Erosion and sediment controls will be implemented to minimise water contamination in accordance with **C-10 Drainage, Erosion and Sediment Control Plan** (DESCP). • Water quality management and monitoring will be undertaken in accordance with **M-2 WQMP** and additionally in response to complaints raised by communities. • Spill clean-up kits and appropriate training for workers will be available in accordance with **P-14 Spill Prevention and Emergency Response Plan** (SPERP). • The wastewater treatment and septic systems at the camp and Site Office will be maintained and operated according to manufacturer's instructions. • The number of incidences of water-borne diseases in the community and within the workforce will be reported separately.	Throughout construction	HEC HSE Manager HEC E&S Supervisor HEC Camp and Office Manager
P-10-5.	Increased dust as a result of construction activities leading to health impacts, including: • Increased incidences of chronic and/or acute respiratory infections, and increased risk of developing pneumonia (especially in children and infants); or • Worsening of existing health issues (non-communicable diseases, such as asthma).	• Actions and monitoring identified in **P-15 Air Quality Management and Dust Control Plan** (AQMDCP) will be implemented such as spraying water on roads and other active construction areas and during activities that generate dust. • Sealing access roads adjacent to villages, community facilities and food gardens will be considered. • **P-3 Stakeholder Engagement and Communications Plan** (SECP) to notify communities before dust-generating activities begin. • E&S Supervisors will carry out regular site inspections and observations.	Throughout construction	HEC Construction Manager HEC HSE Manager HEC E&S Supervisor
P-10-6.	Community health may be impacted by Increases in mosquito habitat from standing water and subsequent potential for vector-borne diseases, e.g. malaria and dengue. Increased generation of rubbish from the camp and influx of non-locals can create potential habitat for vermin, including the Pacific rat (Rattus exulans) - a vector of human diseases.	• **P-12 Waste Management and Point Source Pollution Plan** (WMPSPP) will be implemented including establishing waste sorting areas and regular removal of waste. • Construction site drainage, designed for site conditions, will be installed in accordance with **C-10 DESCP** to avoid standing water. • Mosquito fogging or spraying will be undertaken in consultation with the Ministry of Health and Medical Services (MHMS), using approved pesticides. Frequency will increase during the wet season. • Vector surveillance will be undertaken, particularly during the wet season (November to April) and reviewed annually to ensure best practice. • Vector-borne disease awareness programmes for the community will be provided every year, covering methods of preventing, transmitting, symptoms and treatment of vector-borne diseases. This will help increase public awareness of health issues and work towards preventing the spread of diseases. • Project information disclosure related to the community awareness campaign will be conducted as part of **P-3 SECP**.	Throughout construction	HEC Construction Manager HEC HSE Manager HEC E&S Supervisor
P-10-7.	Project workforce from outside the local community, mixing with the local community, potentially causing spread of COVID-19 and other communicable diseases. Increased income may cause an increase in alcohol consumption, use of drugs, gambling, sex workers, and processed foods. This could lead to family breakdowns due to domestic conflict and violence, unwanted pregnancies, sexual abuse, and/or the spread of STIs, such as HIV/AIDS, and declining health.	• Free condoms shall be available for workers at the medical facility established onsite • Community health awareness programmes on sexual health, healthy eating, vector-borne disease, and domestic violence will be conducted by a qualified third party, including NGOs, and the MHMS. The programme will be run annually, building on the content of previous years, across Bahomea. It is noted that Solomon Island Planned Parenthood Association (SIPPA) is an NGO that has been a key player on reaching communities by spreading awareness on issues like STI/AIDS. HEC has discussed with SIPPA to impart training to the communities on this sensitive topic. • HEC will assist SIG with COVID-19 awareness and education programmes amongst the community. • A range of provisions and controls that will minimise these impacts are described in other plans including: – **P-1 CESMP** (cultural awareness training) – **P-5 Influx Management Plans** (measures minimising influx of population to project areas) – **P-8 WHSP** (measures increase worker awareness and good practice). – **P-9 WCC** (bans on alcohol and drug use, sexual harassment, abuse and exploitation).	Throughout construction	HEC Administration Manager HEC HR Manager HEC Camp and Office Manager CLOs
P-10-8.	Increased pressure on health services from influx of people/workers from outside the local area. Primary health care services already under-resourced.	• A new six bed medical facility will be provided to support the Project. The medical facility will be permanently staffed by two nurses with a weekly visit from a doctor. The proposed layout of this facility is provided within Annex P-8-VI in P-8 WHSP. More complex health care for workers will be sought from Honiara. • The influx of non-local people and families to the area seeking work or improved livelihoods will be controlled through implementation of **P-4 HRLMP**, which has a hierarchy for recruitment giving priority to Guale people, and P-5 IMP, which controls influx of non-locals. • Pressure on basic services as a result of increased alcohol and drug dependency and associated family violence and sexual health. The Project area is not known to have any support services for drug and alcohol dependency, nor for family and sexual violence. In the event monitoring indicates reports of alcohol and drug dependency or violence is increasing, HEC will mitigate this impact through support including: – Formal communication with local level health authorities to understand the current capacities of local healthcare facilities and their ability to cater for additional patients. – Coordination with local health authorities in the case of emergencies including signing a memorandum of understanding (refer to **Annex P-10-III Vector Surveillance and Community Health Services**). Emergency procedure and hotlines will be shared with the local health authorities for ease of coordination. – Working with local stakeholders to ensure that the 'Seif Ples 132' hotline is widely communicated and available. The Royal Solomon Islands Police Force (RSIPF) provides specially trained nurses to provide essential services for family violence including medical aid, psychological first aid, emergency contraception pill, treatment for STIs and HIV, and vaccinations against hepatitis B and tetanus. – Working with THL, the PO and MHMS to ensure that all health care facilities within the Project area are open, staffed and have at least basic first aid and medical equipment.	Throughout construction	Construction Manager HEC HSE Manager CLOs

		– Working with THL and the PO to identify an appropriate external partner that can provide culturally appropriate drug, alcohol and family violence counselling services. The RSIPF Seif Ples Clinic is situated in Honiara and may not be easily accessible for residents of the area. • HEC has provided, and will continue to provide, training regarding sexual exploitation and abuse/sexual harassment control for employees. Training also includes gender, domestic violence, drugs and alcohol, Human Rights legislations, sexually transmitted infections and HIV.		
P-10-9.	Control actions described in this plan will provide positive benefits to communities.	• Construction of a permanent access road from the dam site through to Black Post Road and Kukum Highway will provide better access to local villages. • Reliable temporary water sources will be established that can be converted to supplementary sources following completion of construction, as per **C-7 WSRP**. • Permanent water supply packages, as part of the Community Share Benefit Project (as per the WSRP) will be installed. • Project employees will be encouraged and assisted to make contributions to the National Provident Fund (You-Save), providing a more secure financial future for individuals and their dependents. Arrangements for this programme are described in **P-4 HRLMP**.	Throughout construction	HEC Construction Manager HEC Administration Manager
P-10-10.	Complaints received from community members regarding impacts on health and lifestyle from construction activities.	All complaints received will be responded to systematically following the **P-6 Grievance Redress Mechanism**. Responses and corrective actions will be timely, culturally appropriate and monitored to assess their effectiveness.	Throughout construction	THL Governance Lead
P-10-11.	The risk of a COVID-19 outbreak affecting the workforce and/or camp population. Serious illness or fatality of employees who contract COVID-19 and don't respond well to treatment.	The controls detailed in **Annex P-10-IV COVID-19 Protocol** will be applied to prevent the spread of COVID-19, and to increase preparedness for an outbreak in the workforce and/or community. These include: • Reducing the numbers of people in buildings (no more than one person every four square metres of enclosed space). Manage occupancy of camp dormitories to strictly maintain this allowance for physical distancing. Use single-occupancy rooms as a priority - only use dormitories once all single-occupancy rooms are full, while the pandemic is ongoing. • Introduce measures to keep a distance of at least one metre between people and strict control over external access, queue management - markings on the floor in canteens, barriers, etc. • Avoid crowding by staggering catering times and working hours to reduce workers congregating at common spaces such as entrances or exits, and in canteens, bathrooms and laundries. • Restrict usage of shared areas, such as lounges and recreation facilities. • All common areas and hygiene facilities will be cleaned and disinfected at least daily and between shifts/scheduled eating times. • Disinfectant solutions must always be used in accordance with manufacturer's instructions, including instructions to protect the safety and health of disinfection workers, use of PPE, and avoiding mixing different chemical disinfectants. • High-touch surfaces should be identified for priority disinfection. • All linens and clothing will be laundered in the hottest water possible. • Waste receptacles will be emptied daily, and potential biologically contaminated waste disposed of in a dedicated receptacle with lid and no-touch access. • Provide posters, videos, and electronic message boards to increase awareness of COVID-19 among occupants and visitors and promote safe individual practices in the camp. • Keep detailed attendance and visitor's records for the camp to facilitate contact-tracing. Procedure to be developed by the Tina COVID-19 Working Group. • Set aside the HEC Local House as a dedicated isolation facility in the event of an outbreak, so camp occupants affected with COVID-19 can be separated from other occupants who are well, and can receive dedicated catering and medical care onsite. Develop a plan for the operation of this facility in consultation with the COVID-19 Working Group. • Limit trips of camp occupants and staff to populated areas to essential travel for necessities only. The following activities shall be considered as essential services and shall be allowed: – To get fuel, food and drinking water. – To buy medication, cleaning/medical supplies or to seek medical assistance. – To get items for emergency repairs (e.g. parts for generator, to make the site safe).	Throughout construction	HEC Project Manager HEC Camp and Office Manager HEC Administration Manager HEC HSE Manager

Monitoring Requirements

#	Title	Description	Target / Performance Indicator	Timing / Frequency	Responsibility
P-10-A.	Community Health Monitoring Methodology	HEC will extract health indicators from the public health information collected by MHMS through Guadalcanal Provincial Medical facilities (i.e. Area Health Centre, Rural Health Centres, Nurse Aid Posts). Targeted health monitoring needs to be undertaken as part of the first round of monitoring to further understand the underlying causes of health impacts. This includes: • The prevalence of pneumonia in communities living close to roads and areas where construction activities are proposed. • A culturally appropriate STI survey to determine the existing prevalence in the community. • An investigation into the nature and cause of the high prevalence of stomach pains in local communities to determine if there is any underlying causes that need to be accounted for in project execution and monitoring.	Preparation of Community Health Monitoring Methodology Prevalence of pneumonia, STIs, stomach problems	One off, prior to commencement of construction for Main Works	HEC HSE Manager
P-10-B.	Community Health Monitoring	Regular engagement with MHMS and RSIPF and quarterly collection and monitoring of local public health statistics to determine if there are any spikes in any illnesses reported. Parameters to be monitored (to be confirmed in the Community Health Monitoring Methodology) may include: • Number of respiratory illness and/or health incidences reported relating to dust. • Reporting on increases in prevalence of alcohol and drug dependency, domestic violence and STI's. It is noted that due to the often sensitive and underreporting of this data, anecdotal evidence (such as reports from church leaders) can be used for reporting.	No significant change in health statistics over time	Reported in HEC quarterly E&S Monitoring Reports	HEC HSE Manager CLOs

		• Number of vector-borne diseases e.g. malaria, dengue.			
P-10-C.	Community grievances related to health	• Monitoring and reporting of workers and community members health grievances (e.g. dust, water pollution, mosquitoes, vermin complaints) as per **P-6 Grievance Redress Mechanism**.	Zero (0) grievances related to community health raised each month.	Throughout construction Reported in HEC quarterly E&S Monitoring Reports	THL Governance Lead HEC E&S Manager
P-10-D.	Community education, training and awareness campaigns	• Training records of any community health awareness campaigns and related stakeholder engagement activities.	Training records kept, including names and numbers of attendees, including age and gender	Reported in HEC quarterly E&S Monitoring Reports	HEC E&S Manager HEC Training Manager Community Liaison Officers (CLOs)
P-10-E.	Socio-economic monitoring	Details on indicators and collection frequencies relevant to community health and disease vector management are provided in **Annex P-10-V TRHDP Socio-economic Monitoring Framework**. This monitoring will be implemented by PO.	Refer **Annex P-10-V**.	Once off and 6 monthly	PO

Supporting Documents

Annex	**Name**	**Description**
P-10-I.	Community Health Baseline Survey Report	Results of surveys undertaken in communities in 2020
P-10-II.	Community Health Context	Information from P10 CHVDMP prepared for Lots 2&3 incorporating most recent health statistics and results of household surveys.
P-10-III.	Vector Surveillance and Community Health Services (Agreements with MHMS)	Vector surveillance and emergency communication protocol
P-10-IV.	COVID-19 Protocol	Protocols to follow to prepare for COVID-19
P-10-V.	TRHDP Socio-economic Monitoring Framework	Indicators and collection frequencies relevant to community health and disease vector management

ANNEX - P-10-I Community Health Baseline Survey Report

ANNEX P-10-II COMMUNITY HEALTH CONTEXT

This annex provides a summary of the community health setting in which the project is based, including:

- The current status of public health services in Guadalcanal Province;
- Most recent population health statistics, including incidence of a range of communicable and non-communicable diseases and trends for relevant lifestyle factors; and
- The current status of communities affected by the Project gleaned from various household surveys commissioned by both HEC and PO in 2020 and 2021.

This information has been collated from predominantly secondary sources, aside from the household survey. Comprehensive statistics for public health trends in the immediate Project area are difficult to obtain, due to limited resourcing within the public health system and poor accessibility to some communities. However, this section presents as complete a baseline as is possible with the information available.

The key primary data reference point is the social survey commissioned by the PO, carried out during August and September 2020, with the final report being provided in April 2021. This was undertaken by Fitzgerald Applied Sociology and included analysis of key health determinants. In conjunction with the previous household survey undertaken by HEC in August 2020, provide an appropriately detailed record of baseline conditions in the Project-affected population.

Note: Definitions for key terms such as 'communicable' and 'non-communicable' used in this section have been provided in Section 1.2 above.

1.1 EXISTING PUBLIC HEALTH SERVICES

National health services are funded, managed and regulated across the Solomon Islands by the Ministry of Health and Medical Services (MHMS). The MHMS provides maternal and child health, family planning, dental services, mental health, and immunisation services. Health services are delivered in each Province by provincial health offices. MHMS has a health statistics unit that collects monthly reports from primary health facilities; this data is managed in the District Health Information System (DHIS) database. Data has been collected since at least 2005.

The country's only full-service hospital, the National Referral Hospital (NRH), is the largest in the Solomon Islands located in the capital Honiara. The NRH provides ear nose and throat, plastic surgery, paediatric surgery, vascular surgery, cardiology and cardiac surgery services. It also provides specialised services like Emergency Department, Orthopaedic Department, Ophthalmology Department, General Surgery Department and Obstetrics and Gynaecology. The hospital has over 300 beds and operates with over 50 doctors (Source: Specialised Medical Service – My SIG Services Portal (solomons.gov.sb). The NRH is the final pathway for patients requiring urgent emergency care. In the past, a system operated whereby seriously ill patients were transferred to St Vincent's Hospital in Sydney, Australia, however this was no longer operating effectively as of 2015 (WHO 2015, p77). As a result, waiting lists to receive specialist tertiary care for serious illness outside of the Solomon Islands are considerably long.

The National Medical Store is a central repository which supplies the NRH and all provincial health offices and clinics with pharmaceuticals, medical equipment and consumables.

The levels of care available to members of the public in the Solomon Islands are as follows (with '1' being the most basic of care):

- Level 1: Nurse aid post
- Level 2: Rural health clinic (supervise multiple nurse aide posts in rural areas; staffed by a registered nurse and a nurse aide)
- Level 3: Area health centre (typically staffed by at least two registered nurses, one of whom may be a trained midwife)
- Level 4: Provincial hospital
- Level 5: National Referral Hospital

The NRH also serves as the Provincial hospital for Guadalcanal Province. There is one other hospital in Guadalcanal, the Good Samaritan Hospital, which is a non-state service provider (build by Amici Missione Isole Solomon (AMIS) and supported by the Pieta Sisters of Solomons).

There are six areas in Guadalcanal Province across which health statistics are recorded and analysed by MHMS (known as 'Health Information System (HIS) units'), including:

1. Aola
2. Avuavu
3. **Grove (the Project is located in this area)**
4. Marara
5. Marau
6. Tangarare

Current known facilities within the Grove area are summarised in Table 1. While some of the distances between the Project area may seem convenient to persons unfamiliar with the area, in reality travel can be extremely challenging, especially for people living in the mid to upper reaches of the Tina River catchment. Guadalcanal Island has a mountainous interior, and roads and tracks are generally in very poor condition even in built-up areas. In the wet season, roads become even more treacherous and often impassable either due to landslides, loss of traction for vehicles, or flood waters. The PO social baseline survey evaluated household accessibility to the health facilities and are presented in detail within Chapter Three. The findings, expressed as minutes rather than kilometres, indicates that on average, it takes over one hour for residents within the Core Area of the Project to access the nearest nursing station, with a travel of nearly two hours required to access the nearest doctor.

Table 1 List of known health facilities in Grove area (obtained from Chief Medical Statistician, MHMS, November 2020)

Facility type	Location(s)	Comments	Approx. distance from Project area (straight line) in km
Level 3 (Area Health Centre)	Good Samaritan Hospital, Tetere	Privately operated (mission hospital)	15
Level 2 (Rural Health Clinic)	Turarana	Status unconfirmed	7
	Ngalimbiu	Operated by GPPOL	15
	Tetere	Operated by GPPOL	15
	Kolosulu	Status unconfirmed	30
Level 1 (Nurse Aid Post)	Haiparia	Status unconfirmed	30
	Konga	Non operational as of ~Feb 2020 (anecdotal)	10
	Lungga	Status unconfirmed	15
	Numbu	Status unconfirmed	25
	Tinagulu	Status unconfirmed	10
	Balasuna	Operated by GPPOL	20

To service the Project workforce, a health clinic will be established within the Project Direct Impact Area (DIA) precisely at the Project Office site. This service is provided in order to avoid placing an additional burden (i.e., the Project workforce) on the local health system, which is already under pressure. The clinic will not be open to the general public. It will be a six-bed medical facility staffed by a team of at least two registered nurses (certified by MHMS). The facility will be equipped to provide basic first aid and primary care; in the event of an emergency or severe injury, patients will be transported to the NRH by on-site ambulance. The facility will be supervised by a General Practitioner, Dr Churchill Pedical, who will visit at least weekly for scheduled appointments and to oversee the operations of the clinic. Dr Pedical has an established general practice in Honiara. Once it is constructed, the health clinic will be inspected by MHMS (Infrastructure Division) before becoming operational. Further details on the clinic are available in the Project Workers' Health and Safety Plan (WHSP).

With the ongoing pandemic situation due to COVID 19, The National Referral Hospital provides routine testing for incoming and outgoing passengers through its Molecular Laboratory, which specialises in performing RT PCR tests. The positive cases of COVID 19 are quarantined at the Isolation Unit of NRH.

The Ministry of Health and Medical services continue to provide the COVID 19 vaccines for the Guadalcanal Province at the Central Field Hospital, an extension facility of the National Referral Hospital.

1.2 TRENDS IN POPULATION HEALTH

This section provides a quantitative and qualitative assessment of baseline population health within the area local to the Project, Guadalcanal Province, and the Solomon Islands generally, prior to the start of construction. The assessment has been prepared on the basis of the best information publicly available at the time of writing, being August 2021. It is recognised that there are significant limitations around

the availability of some data, particularly for more socially sensitive topics such as mental health, sexual health, and domestic violence. These limitations are identified in the text below, where they are material to the interpretation provided.

Statistics on population health are collected by MHMS and the Guadalcanal Province Health Department and reported to local (sub-provincial) scale, but not to the scale of individual communities. National statistics for the Solomon Islands are also reported to and analysed by the World Health Organisation (WHO) and the World Bank, among other international organisations. Annual health report cards and online databases such as the WHO Global Health Observatory and World Bank data on health indicators also provide further sources of quantitative data. Overall trends across various metrics for communicable and non-communicable diseases have been identified on the basis of this secondary- or tertiary-sourced information.

Key resources referenced in the following sections include:

- UN ESCAP 2012 *Disability at a Glance 2012: Strengthening the evidence base in Asia and the Pacific*, United Nations Economic and Social Commission for Asia and the Pacific, Social Development Division, Bangkok, September 2012, 166pp.[1]
- WHO 2015 'Solomon Islands Health System Review', *Health Systems in Transition*, Vol. 5 No. 1, 2015, Asia Pacific Observatory on Health Systems and Policies, World Health Organisation, 146pp.
- United Nations Population Fund *Solomon Islands Sexual and Reproductive Health Rights Needs Assessment* April 2015
- Marks M, Kako H, Butcher R, et al *Prevalence of sexually transmitted infections in female clinic attendees in Honiara, Solomon Islands* BMJ Open 2015
- WHO 2018 'Solomon Islands' in *Noncommunicable Diseases Country Profiles 2018*, World Health Organisation, Geneva, 224pp.
- WHO 2020 'Solomon Islands' country page, *World Health Data Platform, The Global Health Observatory*, World Health Organisation, accessed online at https://www.who.int/data/gho/data/countries/country-details/GHO/solomon-islands?countryProfileId=b4905c96-38a0-4581-94aa-9248b10f9789 , 18 November 2020.
- MHMS 2019 *Guadalcanal Province Health Profile 2019*, obtained via personal communication from Chief Medical Statistician, Ministry of Health and Medical Services, Solomon Islands Government, to HEC on 17 November 2020, 26pp.

In addition to these validated data, a household-based health survey was completed by HEC's Project doctor (accompanied by staff from THL and the Project Office) during August 2020, and a social survey commissioned by the Project Office was also undertaken across all Project-affected communities in September 2020. The findings of both have been consolidated and are presented in Section 1.3 below

It is anticipated that further targeted community health surveys and longer term monitoring will be required against baseline conditions and to track any emerging health trend which could be attributable

[1] Majority of data for Solomon Islands sourced from MHMS Community Based Rehabilitation Unit, 2011

to the Project. The approach for these are largely driven by the Social Impact Monitoring Plan (SIMP) prepared by the Project Office and integrated into this plan as appropriate.

1.2.1 Demographics

This section provides a brief overview of the population in Guadalcanal Province, with a specific focus on factors contributing to trends in population health. An in-depth analysis of the demographics within the Project area is given in the Project Influx Management Plan (IMP), on the basis of information collected to inform the Environmental and Social Impact Assessment and from national census data.

The overall population within the Project area (including downstream communities) was approximately 1,800 people as of 2013. As identified by the PO-led socio-economic baseline assessment, given that the 2019 national census results have not yet been released, there is no reliable official data on the local population, its characteristics and trends. A useful overall indicator is the 2015 Tribal Register of all members of the 27 recognised Malango tribes, with a focus on the five tribes owning the Core Land acquired by SIG for the project. This tribal registration indicates a population of some 3,465 persons.

The population of Guadalcanal Province was 115,143 in 2019 (bearing in mind this also includes the nation's capital Honiara, which is densely populated). The national population was estimated at 642,000 in 2015.[2]

Nationally, the Solomon Islands has a predominantly young population, with 39.3% of the total population aged 14 or under in the 2013 national census.

In 2012, the life expectancy at birth was 66 years (males) and 69 years (females) (WHO 2012 and World Bank 2012a, in WHO 2015, Table 1-4, p11).

In approximately one third of households nationally, children under the age of 18 were living without the presence of their biological mother or father (SISO, 2007 in WHO, 2015, p3).

1.2.2 Maternal and new-born health

Maternal deaths are a widely used indicator of the quality and availability of health services to support mothers prior to, during, and after delivery, especially when looking at trends in a smaller population. A total of four maternal deaths were reported in Guadalcanal Province in each of 2018 and 2019; prior to this, there were only 1 or 2 deaths reported per year (2015 to 2017). According to MHMS, it is challenging to report maternal deaths, as it is highly likely that they are underreported by the community (compared with other causes of death). The same challenge is experienced for reporting of neonatal deaths (described below).

The following child mortality rates were elevated in 2019 compared to 2018 in Guadalcanal Province, with the Grove area accounting for a high proportion of deaths across all three metrics:

- **Neonatal Mortality Rate** (NMR; probability that a child will die during the first 28 days of life, per 1,000 live births) = 13 in 2019 (2018 = 8).
- **Infant Mortality Rate** (probability of dying between birth and age 1 year, per 1,000 live births) = 20 in 2019 (2018 = 16)

[2] Solomon Islands National Statistics Office website, accessed 18 November 2020; this estimate was formulated in between census years (2013 and 2019); census data not yet publicly available for 2019, as of Nov 2020.

- **Under-five Mortality Rate** (probability of dying before age 5 per 1,000 live births) = 29 in 2019 (2018 = 28)

Access to Antenatal Care dropped very slightly from 5.8 to 5.2 between 2018 and 2019. This means that a woman in Guadalcanal Province would complete an average of 5.2 visits to antenatal care services prior to giving birth in a given year. Of the six reporting areas, Grove has the lowest rate of access at only 3.7 visits on average prior to delivery (2019). It was estimated that 18% of births were unsupervised in Grove in 2019 (25.3% for Guadalcanal Province). These births were not attended by a skilled health worker such as a doctor, nurse, nurse aide or midwife. The proportion of unsupervised births was higher across the other five areas in Guadalcanal Province.

Based on the above, it appears that newborn and infant health declined between 2018 and 2019, particularly in Grove. This was likely related, at least in part, to the decline in access to suitable maternal health services, including antenatal and post-natal care. However, there are limitations within the dataset and so this trend should be considered as indicative only.

1.2.3 Nutrition and lifestyle

The first survey on non-communicable diseases was completed in the Solomon Islands during 2005 – 2006; undertaken by the WHO using a STEPwise Approach to NCD Risk Factor (STEPS) survey. In the survey, 31% of the population reported that they smoked daily, and approximately 94% of the population reported consuming less than five combined daily servings of fruit and vegetables (WHO 2010, in WHO 2015, p11). The mean salt intake of the population was estimated at 6 grams/day (adults aged 20+; WHO 2018). This is higher than the recommended daily intake of sodium (<2 grams/day of sodium; or 5 grams/day of salt).

The 2018 WHO country profile for the Solomon Islands stated that 25% of females and 16% of males over the age of 18 were considered to be obese; however, only 4% of all children aged 10-19 were obese.

In Guadalcanal Province, it has been estimated that 9.7% of children aged less than 2 years old were classified as 'malnourished' (weighing ≤80% of weight for age).

Sanitation and water supply

Extensive surveys have been conducted across Project-affected communities to inform a Water Supply Replacement Plan (WSRP; C7) for the Project; these surveys are ongoing. Detailed analysis of the demand and supply of potable and non-potable water across these communities can be found in the WSRP, but the findings to date can be briefly summarised as follows:

- None of the communities have a reticulated, treated water supply or reticulated wastewater collection and treatment system.
- Most villages use a combination of one or more water sources and collection methods, for different purposes, from wells and bores (hand pump, or solar or diesel-powered) to rainwater tanks, groundwater- and surface water-fed springs, streams, and the Tina River itself.
- Use of the Tina River is seasonally dependent; during periods of flooding, it is too dangerous to gain access, and water turbidity is poor.

- It was estimated that there could be up to 200 rainwater tanks across Central Guadalcanal, from field observations. Tanks of 5,000 L capacity are readily available and as such are most commonly used in villages either communally or for private dwellings.
- Collection of water is typically the responsibility of women and children.
- Access to water sources can be challenging, and the degree of challenge varies between villages. Risks identified by the communities included steep dirt tracks which become treacherous after rain; makeshift bridges and fallen trees; chronic musculoskeletal injuries caused by continual manual labour (particularly for women), and aggressive or poisonous animals including snakes and centipedes.
- The existing quality of water in the Tina River has been found to exceed WHO guidelines for drinking water (for faecal bacteria indicators) prior to construction. It can be reasonably expected that this has contributed to the incidence of gastro-intestinal illness in the communities using the Tina River as a source of drinking water.

In addition to the above, there is no municipal wastewater treatment plant on Guadalcanal Island. There are some on-site septic systems, mostly in the areas closest to Honiara or in more developed/modern settlements, but otherwise human waste is disposed of via ground soakage, or pit latrines and open defecation (particularly in very remote communities).

From these findings, it can be assumed that access to safe and reliable sources of drinking water, and water for non-potable uses (such as personal hygiene/bathing, laundry and cleaning) is by no means guaranteed, and is highly variable across the communities.

These conditions were reflected in national statistics for water and sanitation (WHO 2018), as follows:

- 9% of households (nationally) had access to a reticulated drinking water supply; the majority relied on a communal standpipe (35%) or a river/stream (25%).
- 12% of households had access to a flushing toilet (private or shared).

1.2.4 Disabilities and special needs

Detailed national statistics on the prevalence of disabilities and the health status of people with special needs in the Solomon Islands are extremely limited, because the national census has historically not included disability disaggregated data to a high level of detail. However, starting with the 2019 census, SIG will be including the Washington group Short Set of Questions on Disability, so it is anticipated that further data will become available in Years 1 and 2 of project construction (2021 – 2022) once the 2019 census results are publicly available.

From international reports (UN ESCAP 2012), it has been estimated that the Solomon Islands:

- Has a prevalence rate of 2.9% of the total population with some form of disability. This equated to approximately 14,403 people with disabilities in 2012; 45% of which were female.
- Of the people with disabilities:
    - 28.4% were physically disabled;
    - 27.4% were visually disabled;
    - 17.5% were hearing impaired;
    - 2.8% were mentally disabled;
    - 5.4% were intellectually disabled; and

- 18.7% had 'other' forms of disability.

The Solomon Islands has a typically had a very limited budget available for disability expenditure compared to other Pacific nations, at less than 0.002% of GDP (PDF 2015).[3] There is no formal system for long-term care of the elderly or disabled people in the Solomon Islands (WHO 2015, p79). Short term care is available via the Community Based Rehabilitation (CBR) programme, for people who have been disabled by disease, traumatic injury, or another cause. Care is typically provided through home visits by a team of field workers, and physiotherapists based out of the NRH in Honiara.

1.2.5 Non-communicable diseases

Drug addiction / dependency

Drug addiction and dependency, and related health issues, are recognised by health practitioners as a significant issue in the Solomon Islands anecdotally (refer to Section 2.3), however very little research has been conducted on this topic specifically regarding its impact on the health of the Solomon Islands population.[4]

Alcohol and marijuana are the primary drugs of concern. A 2011 survey found that a minority of the survey sample had ever used marijuana (14%; GSHS 2011 in Save the Children 2016, p13), however in another survey conducted by Save the Children in 2016, 48% of the total sample of young people had ever used the drug. According to the WHO 2018 country profile, total alcohol per capita consumption in the Solomon Islands equated to 1 litre of pure alcohol per year in 2016 (adults aged 15+). The worldwide average was 6.4 litres per person in the same year.

Alcohol can be legally purchased from bottleshops, bars, nightclubs and restaurants. This includes locally-brewed beer (e.g., Solbrew and the stronger Special Brew (SB)), imported beers, wine, hard liquor ('hotstaf' in Pijin; e.g. gin, vodka, whisky) and premixed drinks. Illegal forms of alcohol include homebrew, prepared from the fermentation of sugar, yeast and fruit juice in water, and *kwaso*, which is distilled from homebrew and as such as a very high alcohol concentration. Both of these illegal forms are popular with low-income earners, unemployed people and youths because they are cheaper than legal alcohol.

The health risks associated with harmful alcohol use include a wide range of toxic effects on the digestive and cardiovascular systems, and increase risk of developing multiple types of cancer. Alcohol suppresses the immune system and can therefore increase the risk of contracting communicable diseases such as HIV and tuberculosis. The effects of alcohol on behaviour (e.g. impaired judgement, ability to react when driving) and mental health also have secondary effects such as increased road accidents (when drivers are under the influence of alcohol), risky behaviour and social harms (multiple sexual partners, unsafe sex, violence and self-harm), and adverse effects on the ability to work and maintain healthy relationships.

Betel nut is commonly used in the population; in a survey conducted by WHO in 2005-2006, it was reported that 78% of males aged 15-24 years old had chewed betel nut in the past year (compared to

[3] PDF 2015 Figure 2, in SDG-CRPD Monitoring report 2018: Full Report, From recognition to realisation of rights: Furthering effective partnership for an inclusive Pacific 2030, Pacific Disability Forum, Suva, Fiji, 2018.

[4] Save the Children 2016 Alcohol, other substance use and related harms among young people in the Solomon Islands, January 2016, Save the Children (study funded by Australian Aid / Australian Department of Foreign Affairs and Trade) and undertaken by the Burnet Institute), available online https://www.savethechildren.org.au/getmedia/420da8b2-c77b-4668-a1e4-0be8441dcc32/SLB_Substance-Use_2016.pdf.aspx, accessed 20 November 2020.

66% of females in the same age group). The average age of first betel nut use was approximately 21 years for males and 22 years for females. Betel nut is the seed of a fruit of the areca palm, which is widely grown in the Solomon Islands. It is a stimulant, and is typically ingested via chewing inside a betel leaf with slaked lime powder or crushed shells. Acute effects of betel nut use can include:

- Euphoria
- Increased alertness
- Increased heart rate and/or palpitations, high blood pressure
- Sweating

Long-term use can cause chronic health effects such as mouth ulcers; gum disease; oral cancers; stomach ulcer; heart disease; dependence, and associated work, financial and social problems.[5]

Family and Sexual Violence

The Solomon Islands has one of the highest rates of family and sexual violence (FSV) in the world, with a January 2016 study noting that 64% of women aged 15-49 have reported physical or sexual abuse by a partner[6]. This has been historically under reported and patients who have reported FSV were not treated or managed appropriately, largely due to time pressures and overcrowding within the hospital systems, including the National Referral Hospital in Honiara.

Strategies have recently commenced to improve reporting of FSV, and the medical and psychological treatment of FSV citims. This has also been accompanied by regulatory changes through the Family Protection Act (2014) and the role of the Royal Solomon Islands Police Force (RSIPF) in establishing Seif Ples. This clinic is based in Honiara and provides specially trained nurses to provide medical treatment and onward referral for clients.

Respiratory illnesses

Lower respiratory infections are the 3rd highest contributor to lower life expectancy (premature mortality) in the Solomon Islands.[7] Asthma is ranked ninth, and affects the younger population (people aged 24 years and under) more than the older population.

In 2019, 387 children per 1,000 people in the Grove area (aged 0-59 months) had acute respiratory infections and were taken to an appropriate health-care provider. This indicator is used as a proxy to measure the incidence of suspected Pneumonia in children aged under 5 years old. This was close to the average of 390 children per 1,000 population across the wider Province. Overall, this metric has reduced since 2015. Similar data for the adult populations is limited, particularly recent data (within five years prior to 2020).

[5] ADF 2020 'What is betel nut?', 6 October 2020, Alcohol and Drug Foundation (Australia), available online at https://adf.org.au/drug-facts/betel-nut/, accessed 20 November 2020

[6] (PDF) Domestic violence in the Solomon Islands (researchgate.net)

[7] Institute for Health Metrics and Evaluation 2010 Global Burden of Diseases (GBD) Profile: Solomon Islands, 2010, available online at http://www.healthdata.org/sites/default/files/files/country_profiles/GBD/ihme_gbd_country_report_solomon_islands.pdf, accessed 20 November 2020.

In August 2020, five new medical ventilators were donated to MHMS by the Australian Government, WHO, and the United Nations Development Program.[8] Ventilators provide artificial respiration via the mechanical movement of the lung, to treat patients who cannot breathe on their own as a result of severe respiratory conditions. This is a significant resource not previously held by MHMS, and is a huge step forward in the level of preparedness for COVID-19 (see Section 1.4).

Diabetes

Diabetes (Diabetes mellitus) is a chronic disease characterised by elevated blood glucose levels, caused by the body's reduced ability to make insulin (and regulate blood glucose). The two predominant types of diabetes are Type 1 (an incurable form of diabetes, where the pancreas produces little or no insulin by itself, and so patients are fully dependent on receiving synthetic insulin to manage the condition) and Type 2 (where the body becomes resistant to or doesn't make enough insulin). Type 2 is the most prevalent form of diabetes, and the development and treatment of the condition is predominantly influenced by lifestyle factors such as excess body weight and lack of physical activity.

Prolonged, elevated blood glucose leads to severe damage to the heart, blood vessels, eyes, kidneys and nervous system.[9] These complications can mean that patients require a higher level of health care, over a prolonged period.

The Non-communicable Disease Country Profile for Solomon Islands (WHO, 2018)[10] stated that 11% of all adults (aged 18+) had raised blood glucose levels. This is relatively high in comparison with the global average in 2014 (9%) and with other countries in 2018. The proportion of females with raised glucose was 2% higher than that of males.

On a local scale, 20.1% of non-communicable disease patients presented at health facilities with diabetes[11] in the Grove area (22.4% across Guadalcanal Province) in 2019. The presentation rate for diabetes has increased annually over the past five years from only 6.3% in Guadalcanal in 2015. This indicates the increasing significance of diabetes as a condition of concern for the local area (and the Solomon Islands in general), placing an additional burden on the health system.

Heart disease, hypertension and other cardiovascular conditions

17% of adults (aged 18+) across the Solomon Islands had raised blood pressure in 2018 (WHO). Similarly, 17% of all adults over 18 were physically inactive; the proportion was much higher for females (22% physically inactive) than for males (12%).

While data on blood pressure trends is not available at a local scale (to the Project area), statistics are available for patients presenting with hypertension. The Grove area has one of the highest proportions of non-communicable disease patients presenting with hypertension in 2019 (44.1%, compared with 37.2% across Guadalcanal Province). However, this was lower than reported in 2018. MHMS reported

[8] UNDP 2020 'Five new medical ventilators officially handed over to the Solomon Islands Ministry of Health', 20 August 2020, United National Development Programme, Pacific Office in Fiji, available online https://www.pacific.undp.org/content/pacific/en/home/presscenter/pressreleases/2020/five-new-medical-ventilators-officially-handed-over-to-the-ministry-of-health.html, accessed 20 November 2020.

[9] WHO 2020 'Diabetes', 8 June 2020, World Health Organisation, available online at https://www.who.int/news-room/fact-sheets/detail/diabetes, accessed 20 November 2020.

[10] WHO 2018 Noncommunicable diseases country profiles 2018, World Health Organisation, available online at https://www.who.int/nmh/publications/ncd-profiles-2018/en/, accessed 16 November 2020, 223 pp.

[11] Statistics do not distinguish between presentation of patients with Type 1 (Insulin dependent), Type 2, or other types of diabetes

that this metric does not indicate prevalence of hypertension as such, but is a proxy for indicating the burden of hypertension-related disease placed on workloads at health facilities.

This, combined with behaviours such as heavy smoking, obesity and alcohol consumption, means that the risk and prevalence of heart disease (and the burden this places on already limited health services) is significant in the local adult population.

1.2.6 Communicable diseases

Malaria

Malaria is a disease caused by *Plasmodium* spp. parasites, carried by infected female *Anopheles* mosquitoes. There are five parasite species that cause malaria in humans; of these, *P. falciparum* and *P. vivax* pose the greatest threat. *Anopheles* mosquitoes are typically most active during the night. Once the parasite is transmitted to a person through a bite from an infected mosquito, it attacks red blood cells. Symptoms can appear within 7 days of the bite, and include fever and chills, headache, joint pain, loss of appetite, vomiting, and convulsions. Malaria can become severe and even fatal if diagnosis and treatment are delayed beyond 24 hours of first symptoms.[12]

Historically the incidence of malaria in the Solomon Islands was very high in the 1990s, with Annual Parasite Incidence (API) rate of 442 people in every 1,000 contracting the disease. This rate was reduced in the subsequent decade, but due to civil unrest in the early 2000s, government-funded programs experienced significant interruption. In 2015, the rate was successfully lowered to 40.5.[13]

The API rate for Malaria has increased since 2016, with 149.3 positive blood samples per 1,000 population in Grove for 2019 (MHMS 2019). This was noticeably higher than in previous years. Figure 1 below shows the number of confirmed cases reported across all areas in Guadalcanal, where it is obvious that Malaria has been most prevalent in the Grove area for all years between 2015 – 2019.

Nationally, malaria incidence has reduced from a rate of over 591 people per 1,000 people at risk (2000 – 2006) to below 319 since 2007 (WHO 2020). Approximately 1% of all deaths nationwide can be attributed to malaria, since 2012 (MHMS 2016, p50).

Dengue virus

Dengue is a virus carried by mosquitos (predominantly female mosquitos of the species *Aedes aegypti*, and less commonly the *Aedes albopictus* mosquito) and transmitted to humans via mosquito bites. *Aedes* spp. Mosquitoes are typically most active during the day. Dengue is a flu-like illness with symptoms including fever, skin rash, vomiting, severe headache, muscular pain and pain behind the eyes. Symptoms can last for 2-7 days, after an incubation period (after a bite from an infected mosquito) of 4-10 days. Dengue can be fatal if it becomes severe; there is no specific treatment. There are four 'serotypes' of dengue virus (DENV), meaning that a person could be infected with the virus four times.

Both type 1 (DENV1) and type 2 (DENV2) dengue viruses have circulated in the Solomon Islands in the past, particularly in populated areas like Honiara. DENV1 circulated around 2002, meaning that people aged under 18 years are likely to be more susceptible. It is thought that DENV2 circulated around 1994.

[12] WHO 2020 'Malaria', 14 January 2020, available online at https://www.who.int/news-room/fact-sheets/detail/malaria, accessed 19 November 2020

[13] MHMS 2016 *Solomon Islands Annual Malaria Program Report (2016)*, Ministry of Health and Medical Services National Vector Borne Diseases Control Program, Monitoring and Evaluation Unit, 2016, 84pp.

The last outbreak of dengue fever was experienced in 2016, with cases concentrated in Honiara and Guadalcanal. There were up to 7,000 suspected cases nationwide.[14] During the outbreak, rapid diagnostic testing was undertaken via the National Medical Laboratory.

Zika virus

The Zika virus is also transmitted by *Aedes* spp. Mosquitoes. Symptoms last for 3-7 days and include fever, rash, headache, conjunctivitis, and muscular and joint pain. According to the WHO, "Zika virus infection during pregnancy can cause infants to be born with microcephaly and other congenital malformations, known as congenital Zika syndrome. Infection with Zika virus is also associated with other complications of pregnancy including preterm birth and miscarriage."[15] There is no specific treatment available for Zika.

Zika was first detected in the Solomon Islands in 2015; some surveillance studies have been undertaken in the population by James Cook University (according to MHMS), but the results of those studies are not publicly available.

The National Surveillance Unit (within MHMS) undertakes surveillance activities for malaria and dengue fever at six 'sentinel' sites across the country, including one site in Guadalcanal Province. Monitoring includes:

- Larva studies
- Grab traps (dengue)
- Light and Ovitrap methods (malaria)
- Insecticide resistance checks

Further information on vector surveillance is provided in Section 5 below.

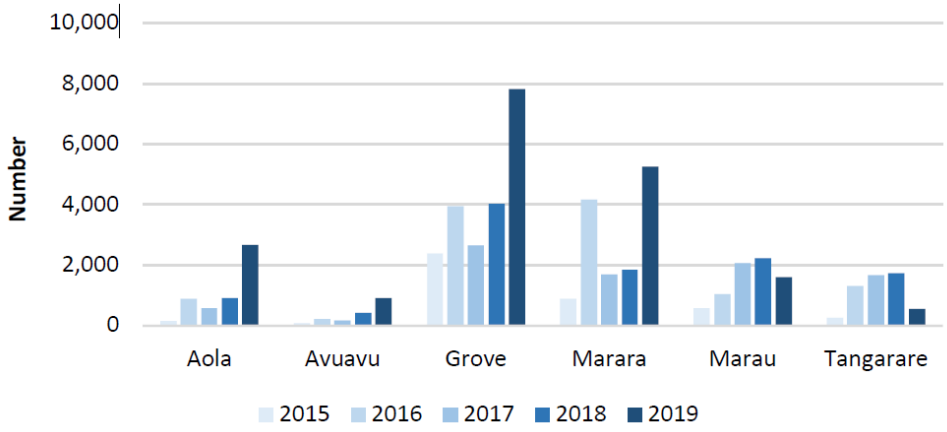

Figure 1 Total confirmed malaria cases by zone, Guadalcanal (2015-2016); Source: MHMS 2019, p11

[14] WHO 2020 'Dengue and severe dengue', available online at https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue, accessed 19 November 2020

[15] WHO 2018 ' Zika virus', 20 July 2018, available online at https://www.who.int/news-room/fact-sheets/detail/zika-virus, accessed 19 November 2020

Sexually Transmitted Diseases (STDs) and Sexually Transmitted Infections (STIs)

Data regarding the incidence of STDs and STIs at a local (provincial or lower) scale is very scarce. However, a report by UNAIDS (2018[16]) noted data provided by MHMS which recorded the following:

- 2,037 men reported urethral discharge, and 218 adults reported genital ulcers in 2014 (nationally)
- In a survey conducted in 2008, approximately 0.8% (from 240 total male respondents) reported having sex with other men in the previous 12 months.
- Guadalcanal Province reported the following incidence of STI cases via testing data in 2017:
    - 209 cases of Urethral Discharge Syndrome (plus 1,507 cases in Honiara)
    - 69 cases of Genital Ulcer Syndrome (plus 180 cases in Honiara)
    - 249 cases of Vaginal Discharge Syndrome (plus 1,713 cases in Honiara)
    - 230 Pregnancy VCCT (Voluntary Confidential Counselling and Testing) Pre-tests (plus 191 tests in Honiara)
    - It was noted that laboratory testing for Gonorrhoea was weak, with "syndromic management being the main course of management of the STI in the country" (p46)

In general, data regarding STIs, STDs, and sexual relationships is incredibly limited due to social stigma around sexual diversity, social desirability bias, and reluctance to self-report.

Knowledge of the symptoms and transmission pathways for HIV, STDs and STIs is limited, along with that of the consequences of unsafe sex practices (WHO 2013, in UNAIDS 2018).

MHMS implemented a human papillomavirus (HPV) vaccination programme for young females during 2015 and 2016, for the prevention of cervical cancer. In the Honiara City Council (HCC) administrative area, 71.8% of eligible girls were fully vaccinated; 11.6% only received a single dose. Coverage for girls in school at the time (in HCC area) was 77.4% (UNAIDS 2018, p48).

Human Immuno-deficiency Virus and Acquired Immune Deficiency Syndrome (HIV/AIDs)

Data relating to HIV/AIDs was not available from WHO (2020) for the Solomon Islands. The following information was obtained from a report published by UNAIDS (2018) using data provided by MHMS.[17]

UNAIDS classified Solomon Islands as having low prevalence of HIV (estimated at 0.002%) since 2010.[18] As of 2018, there were 12 people known to be living with HIV in the Solomon Islands (8 female, and 4 male). All of these people receive antiretroviral therapy.

In a Demographic Health Survey conducted by MHMS in 2015, 37% of female respondents and 49% of male respondents reported knowing where they could get an HIV test. This knowledge was found to increase with increasing levels of education and wealth, but was less common amongst people who had never married and had not yet become sexually active. The Guadalcanal province was identified as having the least levels of knowledge about where to get an HIV test, along with Malaita.

[16] UNAIDS 2018 Solomon Islands – Global AIDS Monitoring 2018, Monitoring the 2016 United National Political Declaration on Endings AIDS; Ministry of Health and Medical Services National HIV/STI Programme, Solomon Islands 50pp.

[17] UNAIDS 2018 Solomon Islands – Global AIDS Monitoring 2018, Monitoring the 2016 United National Political Declaration on Endings AIDS; Ministry of Health and Medical Services National HIV/STI Programme, Solomon Islands 50pp.

[18] UNAIDS 2018, p11

Tuberculosis

Tuberculosis is caused by the bacteria *Myobacterium tuberculosis* which is spread from person to person through the air. Symptoms include a productive cough (sometimes with blood contained in sputum), chest pains, weakness, weight loss, fever and night sweats. Symptoms can develop gradually, making it difficult to diagnose, particularly in children. Treatments are available and it is possible to be cured of tuberculosis through a standard 6-month course of antimicrobial drugs.[19]

In 2019, 66 people in every 100,000 lived with tuberculosis each year. Historically, the incidence rate has ranged between a minimum of 52.63 (2014) and maximum of 106 (2005) during the period 2000 – 2019 (WHO 2020).

In 2017, the Solomon Islands recorded an effective treatment coverage rate of 73.6% for tuberculosis.

Measles

Measles is caused by a highly contagious virus, with initial symptoms including a high fever, runny nose, cough, and red/watery eyes. After a few days (on average, 14 days after exposure to the virus), a rash appears and gradually spreads from face and upper neck to the hands and feet. The virus can cause serious complications and potentially death, particularly in children under 5 years old, or in adults aged over 30. These include blindness, encephalitis (causing brain swelling), ear infections, or pneumonia.

There have been several occasions in the past few years, namely since 2015, where the Solomon Islands have been at high risk of experiencing an outbreak, due to outbreaks elsewhere in the Pacific (such as Samoa). As such, there have been extensive campaigns to vaccinate the population, and particularly young children, against measles.

Across Guadalcanal Province, 96.3% of children aged 12-23 months old received one dose of measles-containing vaccine during 2019. Coverage for the measles vaccine increased during 2019 (compared to previous years) due to a targeted public campaign.

The Solomon Islands Government, Ministry of Health and Medical Services, on January 2020, issued a Travel Advisory that requires travellers arriving in the Solomon Islands to be vaccinated against measles and provide proof of vaccination upon entry.

Influenza-like illness

Various strains of influenza have affected the Solomon Islands population historically. Influenza-like illness is one of the five priority syndromes monitored monthly by the National Surveillance Unit (alongside acute fever and rash, diarrhoea, prolonged fever, and dengue-like illness) (WHO 2015). Both Influenza A and B were circulating in the western Pacific as of October 2020. Cases of Influenza-like illness fluctuated in the range of 200-400 cases in the Solomon Islands throughout 2020, after a peak of just under 500 in the latter months of 2019.[20]

[19] WHO 2020 'Tuberculosis', 14 October 2020, available online at https://www.who.int/news-room/fact-sheets/detail/tuberculosis, accessed 19 November 2020.

[20] WHO 2020 Pacific Island Countries and Areas (PICs) – ILIL Surveillance, PacNet Bulletin, Figure 12, in *Bi-weekly Influenza Situation Update*, p6, 21 October 2020, World Health Organisation, available online at https://www.who.int/docs/default-source/wpro---documents/emergency/surveillance/seasonal-influenza/influenza-20201021.pdf?sfvrsn=39dcc97a_38. Accessed 20 November 2020.

1.3 SUMMARY OF COMMUNITY HEALTH BASELINE SURVEY FINDINGS

The primary data pertaining to community health baseline within the Project area is derived from the outcomes of two separate surveys, being a dedicated Community Health Baseline Survey (CHBS) undertaking during April 2020 and the PO's 2020 social baseline survey. This section presents a summary of key findings from these surveys.

1.3.1 Overview and methodology

A Community Health Baseline Survey (CHBS) was undertaken during April 2020 with the support of HEC and the Project Office to investigate the baseline health status of the local communities and gain some understanding of their immediate health needs. The survey findings were reported in July 2020. Table 2 provides a timeline for the survey and a list of locations visited.

Table 2 Timeframe and spatial extent of survey

Date of Survey	Name of Village	Communities Residing	Number of Households Surveyed
7 April 2020	Vera'ande (Grasshill, Verabisi, Forest)	Bahomea, Malango, Central Guadalcanal	19
7 April 2020	Verakabikabi Village	Bahomea, Malango, Central Guadalcanal Province	21
8 April 2020	Ngongoti Village	Bahomea, Malango, Central Guadalcanal Province	3
8 April 2020	Marava Village	Bahomea, Malango, Central Guadalcanal	11
8 April 2020	Valele Village	Bahomea, Malango, Central Guadalcanal	8
15 April 2020	Managikiki & Verakuji Village	Bahomea, Malango, Central Guadalcanal	29
16 April 2020	Antioch & Valesala Village	Bahomea, Malango, Central Guadalcanal Province	9

The survey included an assessment of the following factors:

- Source and quality of water
- Types of sanitation used by the communities
- Accessibility of healthcare centres in Guadalcanal Province, and in the immediate vicinity of the Project
- Health risk factors
- Identify common/recent illnesses affecting individuals and households
- Identify any existing medical conditions
- Identity any diseases emerging due to poor living conditions

The survey was restricted to communities located within 1km Access Road for the Project; which include traditional land owners of the Tina River (as per the Land Acquisition and Livelihoods Restoration plan, and the Community Benefit Share Project (CSBP), and people over the age of 18.

Interviews were conducted with 99 households across the following villages (number of households in parentheses):

- Antioch (12)
- Managikiki (29)
- Ngongoti (3)
- Marava (11)
- Valele (8)
- Vera'ande (6)
- Verabisi (9)
- Verakambikambi (21)
- Forest area (no formal settlement) (4)

The PO-led social survey was intended to describe the conditions within the Project's area of impact before the start of major construction and benefit sharing activity. It was a mixed methods study which, in addition to a representative random sample survey of 245 households in the Malango cultural area, included key informant interviews, focus group discussions and analysis of existing secondary data. The household survey captured 134 households within the Bahomea cultural area, 86 within the Malango/Belaha and 25 from the settler households, and covered a wide range of topics, including aspects relating to community health.

1.3.2 Access to Health Services

The HEC survey comprised a total sample of 450 people, with the majority averaging between the ages of 16-39 years old. **There are no healthcare centres or clinical operations within the communities surveyed**. As a result, 71% of the households must travel to Honiara, while 29% must travel to Good Samaritan Hospital in Guadalcanal Plains for medical attention. The majority travel to these healthcare centres via public transport if they can afford it. There is no proper treatment for first aid or emergencies available within the communities.

The PO's social survey also looked at access to health services**.** Across the area, it takes an average of 67 minutes for people to get to their nearest nursing station, and 94 minutes to get to a doctor. Those in the Malango district appear to be closest to nursing stations, on average 28 minutes away, while Bahomea residents have the furthest to travel (92 minutes). The Settlers are typically 54 minutes from a nursing station and Belaha residents 42 minutes. Based on the survey responses, the nursing stations most visited are at Verakabikabi in Bahomea, the Good Samaritan Hospital at Nguvia, Chichinge in Malango, and Relocation Village in Belaha.

Malango, Belaha and Settler households must travel about 75 minutes to see a doctor, while the Bahomea residents, who are more remote from Honiara, must travel for about 110 minutes. Based on the survey responses, doctors appear to be available at the Good Samaritan Hospital at Nguvia, and the National Referral Hospital and private clinics in Honiara.

The general lack of access to medical and health services was also listed as one of the main difficulties faced by households. The PO-led household survey noted that over 80% of households reported lack of access to medical services being of high concern, behind only crop damage in frequency. Health services

was also listed as being high on local development preferences for vulnerable households, behind only provision of water supply systems and hygienic latrines (both of which are also community health driven concerns)

1.3.3 Health seeking behaviours

The PO-led survey evaluated health seeking behaviour through questions aimed at determining how households treated illnesses in the family. The majority (66%) noted that they make the journey to the nurse aide post of health clinic, with 30% reporting as treating it themselves using a traditional cure or medicine. Only 11% of respondents noted that they had utilised prayer at some stage, and a smaller number (4%) had sought help from a knowledgeable local person. These statistics indicate in general people will try to seek formal medical treatment where available.

However, communities need to balance this with the financial burden associated with travelling to the medical facilities, paying for treatment, and having family members both support them while away and to ensure the household remains functioning. The April 2020 survey found that cost and travel is always an issue and if there is not sufficient cash, then they cannot travel to the health care centres in Honiara for treatment of more complex conditions. This leads to disease progression and reduced health outcomes.

1.3.4 Water, sanitation, and hygiene practices

Most of the households are using man made springs as their source of water for drinking and cooking, followed by natural springs, streams, and rainwater tanks. Streams and natural springs are often used for showering and washing. A minimal number of households use water tanks, wells, and boreholes as their source of water for drinking, washing and shower. This was clearly demonstrated within the PO-led survey which indicated that more than half of the surveyed households source their drinking water from an unprotected surface source, such as a river (46.57%) or spring (9.80%). In addition to this, 10.78% sourced from unprotected wells. Compounding the issue of drinking water from unprotected sources, is the fact that a large portion of surveyed household (60.42%) do not treat water before consuming it, however the remainder undertake processing through means such as boiling, sand filtration or a commercial filter. 55% of households reported that they purchase bottled water, but only 1% stated that they utilise this as their primary drinking water supply.

The PO-led household survey looks comprehensively at accessibility to sanitation systems. Pit latrines were the most common arrangement, with 50.4% of households having access to a private pit latrine. However, 27.5% of households reported as practicing open defecation, with only 15% of households have access to a modern flush or water sealed toilet. The widespread use of pit latrines without any form of primary or tertiary treatment of effluent, has the potential to further pollute groundwater systems and unprotected water sources.

1.3.5 Nutrition

Nutrition was a focus of the PO social survey, with data on access to nutrition among households gathered using a 24-hour meal recall question. In general, the diet of local households is largely comprised of:

- Carbohydrates in the form of imported rice (eaten at least once in the 24-hour period by 94% of households), root crops such as potatoes, kumara, and cassava (eaten by 65% of households), and bread and cake eaten mainly at breakfast
- Green-leafed vegetables eaten daily by 89% of households.

These are supplemented by a range of vegetables, fruits, and nuts. Only 33% of households in the survey reported as having eaten fish or animal protein in the past 24 hours. The protein comes largely as canned tuna fish, though some reported as having eaten chicken, pork, or shop-bought sausages, mince or corned beef.

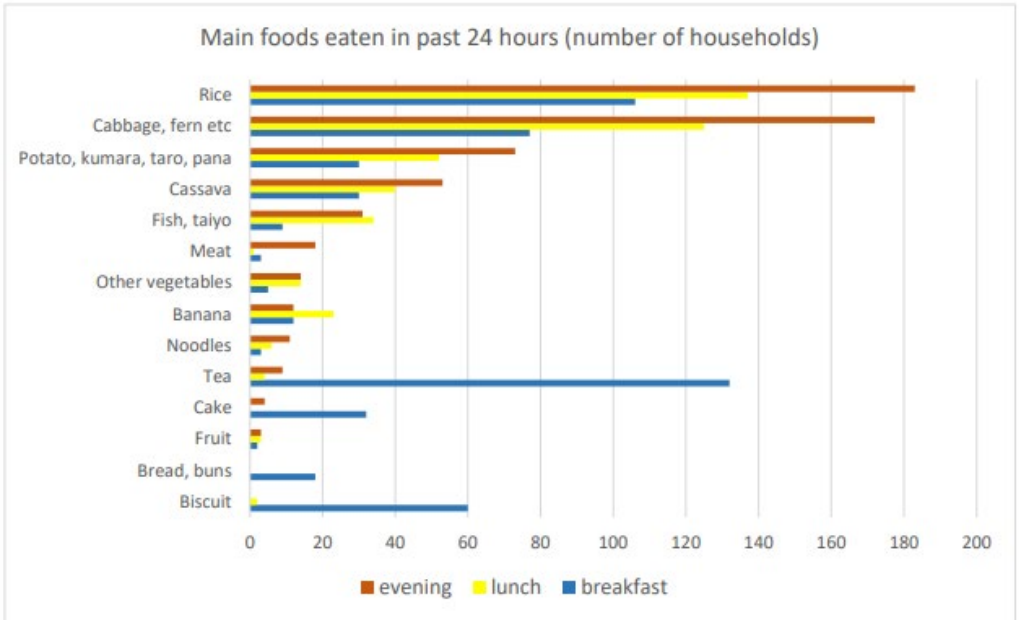

Figure 2 Main Foods Eaten in Past 24 hours (number of households)

1.3.6 Non-communicable health issues

Smoking, chewing betel nut, and alcohol consumption were identified as the main health hazards along with poor rubbish disposal and poor hygiene due to the lack of a safe potable (and accessible) water supply. Poor rubbish disposal (e.g., empty cans, tins along roadsides and around villages) exacerbates the breeding of disease vectors such as mosquitoes and houseflies, which can contribute to increased cases of malaria and diarrhoea.

The April 2020 community health survey investigated in detail common and chronic illnesses, summarised in Figure 3 and Figure 4 respectively.

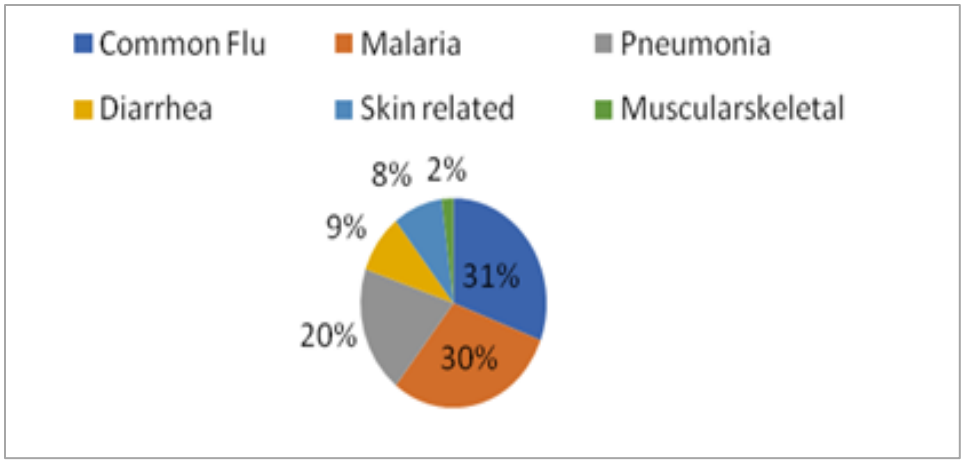

Figure 3 Common illnesses affecting surveyed communities (April 2020)

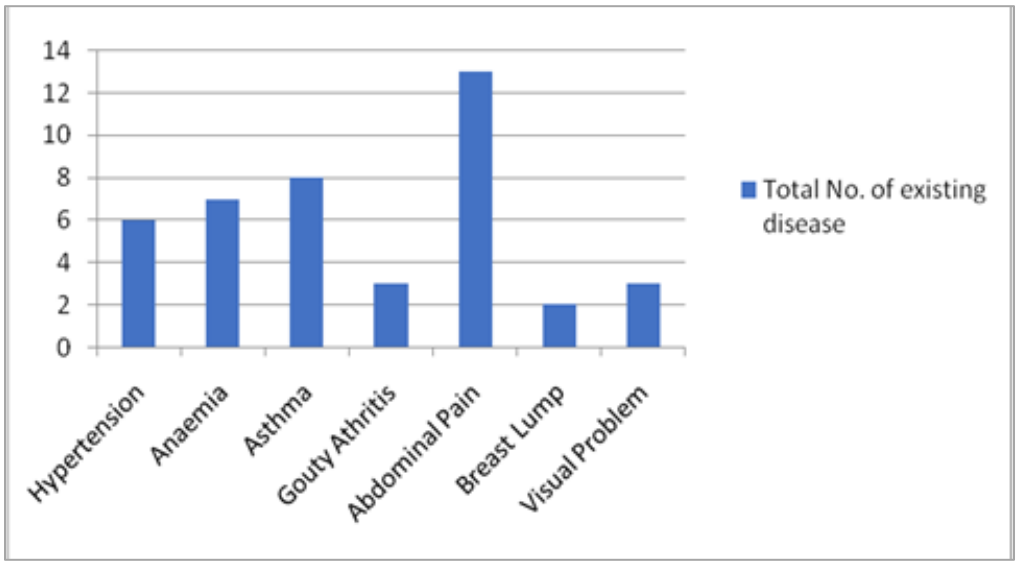

Figure 4 Chronic illnesses affecting surveyed communities (April 2020)

The most common illnesses were found to be common flu, malaria, pneumonia, diarrhoea, skin-related diseases, and muscular pain. The following basic trends have been extrapolated from this data:

- The high prevalence of the reported common flu (31%) and pneumonia (20%) is postulated to be caused by a multitude of factors. This includes poor personal hygiene (due to no taps being available to regulatory wash hands), children being exposed to smokers, smoking rates of 19% within the adult population, communities residing in proximity to dusty roads, and the issues of affordable access to health care meaning that simple cases often develop into pneumonia
- 30% of the surveyed households had experienced episodes of malaria in the previous 12 months. It is unknown whether this is clinically diagnosed malaria, however it appears that there are many opportunities for the primary disease vector (ie mosquitos) to breed in the area

- 9% of the interviewed households reported as having experienced diarrhoea, which is noted in the report to be linked to risk factors associated with the low availability of sanitation facilities and overland flooding leading to primary sources of drinking water being easily contaminated with *E.coli* bacteria. 33 households (14%) report that at least one person in their household was believed to have been sick in the previous week due to the drinking water.
- 8% of the population also reports skin rash, reportedly connected with streams contended to be contaminated by oil. Given the reliance on unprotected water sources, this is likely to present an ongoing health concern.
- 31% of the interviewed households reported as experiencing chronic abdominal pain. The nature of these chronic pains was not established or further evaluated from a clinical perspective. Given the prevalence of unprotected water sources and other illnesses generally linked to poor water quality, these pains may be linked to other water borne illnesses such as giardia.

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No cases of diabetes, malnutrition, mental illness, and childhood diseases like epilepsy, low birth weight, Cerebral Palsy or congenital heart problems were reported in this survey.

The survey concluded that there is a high risk to these communities for non-communicable diseases as 22% of the adult population surveyed were found to be smokers and heavy alcohol consumers. Additionally, this risk factor has been thought to contribute to social problems (detailed below).

1.3.7 Communicable diseases

The survey found that the most prevalent communicable disease was influenza (common flu), and 20% of interviewees had experienced pneumonia in the two months prior to the survey. There is a high prevalence of malaria cases (30% of households has experienced malaria in the preceding two months) and communities have a high risk of dengue outbreaks (also a vector-borne disease) given the availability of potential mosquito breeding grounds.

Other communicable diseases such as Sexually Transmitted Infections (STIs) were not covered within the scope of either survey. This was largely due to the nature of the surveys (open households surveys and focus group discussions) making it an inappropriate setting to attain any information/response regarding STI's. It is recommended that a follow-up survey is undertaken with individuals only (rather than entire households at one time) to gather more information on these more personal conditions, and to determine specific parameters such as Body mass Index (including height and weight); nutritional status; sexual history and practices, and blood pressure. However, it is still to be decided (in consultation with the SIG and Lenders) whether this type of survey is appropriate, and through what mechanism or collaborative setting (eg with a health care NGO) it is best undertaken. This is recognised as being important baseline data given the spread of STI's has been identified as a potential impact both in the ESIA and the Influx Management Plan (IMP).

1.3.8 Disabilities and Long-term Health Problems

Households who are vulnerable and/or contain members with disabilities or long-term chronic health problems can have a higher degree of susceptibility to loss, with any potential loss resulting in a negative impact on wellbeing or livelihood for the person. In the case of community health, these households can be vulnerable due to underlying health conditions (eg disabled family members) or have poor access to

sanitation or drinking water such that minor changes to existing systems can have catastrophic health impacts (eg pollution of drinking water sources)

35% of households had a least one member with a long-term health problem or disability. These are mainly physical disabilities and long-term chronic illness. The overall disability rate (being the percentage of total persons in surveyed households with a reported disability) was 5.9%.

1.3.9 Gender and Vulnerability Aspects

The disaggregation of gender based on vulnerable household categorisation and gender is not complete, primarily due to the surveys being aimed at HH level understanding with the HH head generally answering on behalf of other family members. However, there are some important features that can be gathered from the information at hand:

- The PO-led survey did note that there is little difference in the reported drinking water quality between female HHH and male HHH, with there also being no difference in the reported incidences of water-related sickness.
- Regardless of the above, Female HHHs have a higher reliance on unprotected water sources such as streams and rivers for drinking water, with 57% using these compared with 38% for male HHHs. It can be reasonably linked that female HHHs would be more vulnerable to any changes in water quality.
- Water quality was rated highest by the Malango and Belaha respondents, where 96 and 95% of the respondents described their water as clear. The Bahomea (80%) and Settler (68%) were lower. The Settlers were most likely to have discoloured water especially at Verakabikabi
- The PO-led survey found that there were 67 males and 65 females with a disability or serious illness recorded, being no significant difference across genders

Additional information is required to further understand vulnerabilities and how these are related to exposure to communicable and non-communicable diseases. For example, poorer households may generally live closer to the road networks, which in turn places them at higher risk of exposure to dust.

In order to understand the Project's impacts on different genders throughout the implementation of the Project, evidence-based evaluation of Project's impact on different genders will need to be conducted. This will require the implementation of monitoring regime and indicators. All monitoring should be conducted in a way that gender disaggregate data can be compiled to support the evaluation of Project's impact on different genders.

1.3.10 Social issues

The surveys also provided some insight into social issues experienced in the community, which could also impact on the health and wellbeing of individuals. These included:

- Extra-marital affairs, leading to poor health (from stress) and financial difficulties for women left alone (especially with children)
- Excessive alcohol consumption, contributing to social disturbances/arguments, sexual harassment, unwanted pregnancies and 'disharmony among youth'.
- Poor waste disposal practices, contributing to increased incidence of malaria and dengue fever.

As with the poor availability of medical facilities, the area is exceptionally poorly equipped with facilities and support services to manage alcohol and drug dependency and domestic violence. Summary of Trends

Based on the above information, it is apparent that the communities within the Project area face a number of health challenges that, if not addressed, can be impacted by Project activities. Large proportions of households have at least one member with a long-term health problem or disability. Key trends from the baseline data include:

- While people will tend to seek access to healthcare, the lack of appropriately resourced facilities within the area and the cost of transport required to reach facilities such as those in Honiara, place a high burden on people's limited financial resources. Simple illnesses can quickly progress without health interventions. The lack of health facilities extends to support facilities for dealing with alcohol and drug dependency and domestic violence.
- It is well established that lack of access to protected drinking water sources and use of pit latrines are widespread across the community. This has manifested in waterborne illnesses being common across the community. There is also a high proportion of people reporting undiagnosed chronic stomach pain which may also be linked. Any impacts to water quality will be in the context of any already vulnerable population
- Large proportions of interviewed households reported as having experienced either flu or pneumonia like symptoms in the previous 12 months. This indicates an already high prevalence of respiratory illnesses in the area, which need to be managed to further reduce dust exposure of communities in proximity to access roads in Lot 1, Lot 2 and Lot 3.
- Malaria is widely reported in the area
- There is low levels of protein within peoples diets, with only 33% of interviewed households reporting having eaten any fish or animal protein in the previous 24 hours.

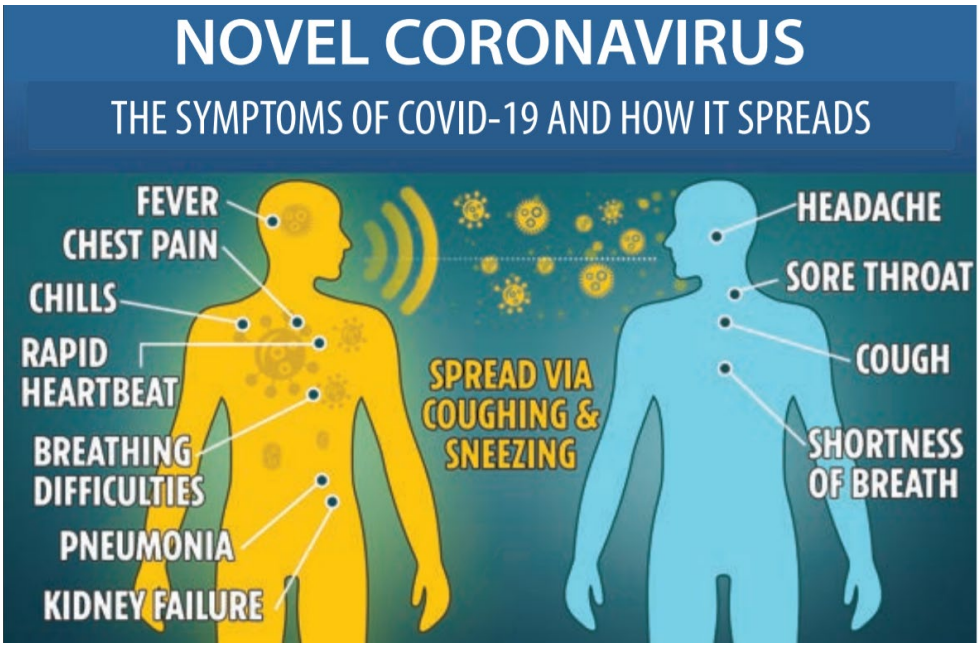
1.4 GLOBAL COVID-19 PANDEMIC

1.4.1 Context

On 30 January 2020, the World Health Organisation declared an outbreak Coronavirus disease (COVID-19) a "public health emergency of international concern". The outbreak was declared a global pandemic on 11 March 2020. As a result, international travel has been severely restricted, and movement within the Solomon Islands is also subject to limitations set by the national government.

COVID-19 is an infectious viral respiratory illness[21] spread via droplets of saliva or discharge from the nose when an infected person coughs or sneezes. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

[21] Information on COVID-19 presented in this section has been sourced from the official World Health Organisation Health Topic online resource available at https://www.who.int/health-topics/coronavirus#tab=tab_1 , current as of 11 September 2020.



Graphic source: MHMS 2020 Coronavirus Fact Sheet

On average, it takes 5–6 days from when someone is infected with the virus for symptoms to show, however it can take up to 14 days.

At the time of writing, there had been 20 reported cases within the Solomon Islands, all imported from overseas (in quarantine), with no community transmission[22]. The last reported case was in March 2021. The vaccination programme in the Solomon Islands has seen a total of 56,621 doses administered to 6 August 2021, which in a population of approximately 670,000 indicates that the vast majority of the population remain unprotected.

The table below provides a guideline to key terminology used in this plan (and related ESMPs) regarding the ongoing COVID-19 pandemic. Definitions have been sourced by various World Health Organisation resources, and pamphlets (e.g. on quarantine procedures) published by MHMS.

Table 3 Definition of terms commonly used in association with the COVID-19 pandemic

Term	Definition
Confirmed COVID-19 case	A person who has positive laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.
Probable COVID-19 case	A person who meets clinical criteria (as for 'suspected' case below) AND is a contact of a probable or confirmed case, or epidemiologically linked to a cluster with at least one confirmed case.
Suspected COVID-19 case	A person who meets the clinical and epidemiological criteria as follows: **Clinical criteria:** Acute onset of fever AND cough;

[22] WHO 2020 Coronavirus Disease (COVID-19) Dashboard, as of 19 November 2020

Term	Definition
	OR Acute onset of ANY THREE OR MORE of the following signs or symptoms: Fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnoea, anorexia/nausea/vomiting, diarrhoeas, altered mental status. **AND Epidemiological Criteria:** Residing or working in an area with high risk of transmission of virus: closed residential settings, humanitarian settings such as camp and camp-like settings for displaced persons; anytime within the 14 days prior to symptom onset; OR • Residing or travel to an area with community transmission anytime within the 14 days prior to symptom onset; OR • Working in any health care setting, including within health facilities or within the community; any time within the 14 days prior of symptom onset. *Note: A patient with severe acute respiratory illness (SARI: acute respiratory infection with history of fever or measured fever of ≥ 38 C°; and cough; with onset within the last 10 days; and requires hospitalization can also be considered a suspected case)*
Community transmission	Where larger outbreaks of local transmission are experienced, defined through an assessment of factors including, but not limited to: • large numbers of cases not linkable to transmission chains • large numbers of cases from sentinel lab • surveillance or increasing positive tests through sentinel samples (routine systematic testing of respiratory samples from established laboratories), multiple unrelated clusters in several areas of the country/territory/area.
Contact	A person who has experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case: 1. face-to-face contact with a probable or confirmed case within 1 metre and for at least 15 minutes 2. direct physical contact with a probable or confirmed case 3. direct care for a patient with probable or confirmed COVID-19 disease without using recommended personal protective equipment OR 4. Other situations as indicated by local risk assessments.
Cluster	Where cases are clustered in time, geographic location and/or by common exposures
Face mask	A medical grade face mask will have the following attributes: • Good breathability • Internal and external faces are clearly identified (e.g. blue on one side, white on other, or shaped to face) • 98% droplet filtration, preferably fluid resistant (this can be achieved by a mask meeting ASTM F2100 Level 1, 2 or 3, EN14683 Type II R, or equivalent standard). **Any personnel undertaking a 'front line' health and safety, security or medical role for this Project shall be given priority for supply of medical grade face masks.**

Term	Definition
	Reusable cloth face coverings can also be effective in reducing the transmission of COVID-19, for the general public (not engaged in one of the roles specified above). However these masks will not be as effective as a medical-grade mask. WHO guidance on the use of homemade face masks in low-resource communities is attached as Annex D, and this advice will be used as part of community-based awareness training.
Hand sanitiser	Alcohol-based liquid hand sanitiser (with between 60-80% alcohol content) in spray, gel or liquid form. Used to cleanse skin when hand washing facilities are not available, and if hands are not visibly soiled.
Lockdown	An emergency protocol that requires citizens, residents or workers within a defined zone to stay at home (or in a designated location/zone) except for essential and emergency purposes. It is a measure employed to restrict the movement of people during emergency conditions. Entry and exit points to any lockdown zone established by SIG will be secured and monitored by the Royal Solomon Islands Police Force (RSIPF). A lockdown may also include curfews, where people must stay in their home or premises during the declared curfew time (e.g. during the night). Curfews can be enforced through the Solomon Islands Emergency Powers (COVID-19) Regulations 2020.
Mandatory quarantine	People who are well but may have been exposed to COVID-19 are kept separate from the rest of the population, to monitor their condition. People in quarantine are restricted from moving outside the facility. If they become sick during quarantine, they will be immediately transferred to an isolation centre.
Isolation	Sick people with the disease are physically separated and cared for separately from those who are not sick. An isolation centre will generally be established as a dedicated ward in a hospital, or some other designated venue.
Physical distancing	Maintaining a distance of at least one metre between people, at all times

1.4.2 Risks to community health

There could be serious adverse outcomes (including high numbers of cases, community transmission, and fatalities attributed to respiratory failure and related complications) if COVID-19 was to spread within the Solomon Islands, given the current status of primary health care in the country. Several factors would hinder the speed and efficacy of any public health response to an outbreak of COVID-19, including:

- There are very low vaccination rates in the Solomon Islands, with only 56,621 doses of vaccine being administered to date, from a total population of 670,000. The entire population therefore remains at high—risk of being infected and overwhelming the public health system
- Poor access to safe and reliable drinking water supply, and water for sanitation, especially in informal urban settlements and rural communities,
- Households are typically large and multi-generational; accommodation is often over-crowded and does not allow for adequate physical distancing between occupants.

- The public health system is already under-resourced, particularly with a lack of operational rural health clinics in the Grove area. This means that in the event of an outbreak, which is likely to be concentrated in Honiara (due to it being the major port of entry for Solomon Islands, and having a higher population density than outlying areas), it is likely to be difficult for the public to get assistance in the Grove area.

The following risks have been identified in relation to COVID-19, the impacts of a potential outbreak on the Project, and risks generated by a combination of Project activities and a COVID-19 outbreak to the community:

- The Project Office, THL and HEC all have corporate offices in Honiara, where the majority of the workforce will be based. After the start of construction, the project workers shall shift to the Project Office site.. Honiara is the most densely populated municipality in the Solomon Islands.
- While the majority of workers required for the Project are being sourced from the Solomon Islands, there is a proportion of the workforce (namely in skilled/managerial roles) which are being sourced from other countries such as the Republic of Korea, India, Pakistan, Fiji, Srilanka, Philippines and Australia. All of these countries have had active COVID-19 cases (including community transmission as of August 2020.
- The Project Direct Impact Area and workers' camp are located close to a major access route (Black Post Road) connecting many villages from the upper Tina River catchment through to the Kukum Highway and Honiara.
- Up to 214 workers will be accommodated in the workers' camp at any one time during construction. The risk of a COVID-19 outbreak in the camp is higher if appropriate mitigation measures (such as those outlined in the HRLMP) are not proactively and effectively implemented.
- The risk of any COVID-19 outbreak spreading is also higher when locally-employed workers are living in their own homes, in the local communities. This is especially relevant for this Project, where the recruitment hierarchy gives first priority to Guale people living in Project-affected communities. Local workers will be interacting with staff from overseas.
- Access to health services is poor in Project-affected communities. This means that people may also experience difficulties in obtaining information from health authorities about the risks of COVID-19, preventative measures and related responses. They may also be vulnerable to misinformation disseminated through informal channels (word of mouth, social media).
- Respiratory conditions are known to exist in the local community (as per Section 2.2.5); as such there could be a number of people at high risk of developing severe respiratory infections if they contract COVID-19, requiring hospitalisation and intensive care. This would place a further burden on an already under-resourced health system, and could lead to elevated mortality rates.

1.4.3 National and Project-specific COVID-19 response

A Project-specific risk assessment and policy for the management of any COVID-19 related risks to (and from) the Project, and related response, has been developed by the Project Office and THL (Annex C). This policy incorporates the requirements of SIG (including those from the Consolidated National Preparedness and Response Plan for COVID-19, issued 12 March 2020). Similarly, HEC have also developed a specific protocol targeted at managing the workforce and Project assets and operations both in terms of preparedness, and in the event of an outbreak during construction. The approach

outlined in both documents is summarised here, but the original documentation and a full impact assessment is appended in Annex C for reference. This Covid-19 plan has been reviewed and approved by the Lenders and has been approved for implementation

Implementation of the Project-specific COVID-19 management policy is primarily the responsibility of the Project Office's Deputy Project Manager, who will be assisted and supported by other SIG agencies, SIEA, the PO E&S Safeguards Manager, THL and HEC as required.

National or provincial measures (implemented via direction from SIG):

- Mandatory quarantine of all travellers (including Solomon Island nationals and foreign nationals) on entry to the country, in a government-approved facility
- COVID-19 testing program to screen in-migrants, and to investigate any suspected cases of COVID-19
- Lockdown drills in Honiara (the first of which was held between 20-22 May 2020) to test the city's response in the event a lockdown is required to contain the population prevent or slow down the rate of community transmission

Measures specific to the Project and/or Project-affected communities (implemented by THL and HEC, with support from PO where necessary):

- A TRHDP COVID-19 Working Group will be established, with representatives from the PO, other SIG agencies, SIEA, THL and HEC to share information, develop procedures, and coordinate preventative actions, mitigation and monitoring activities. The remit of this group is further outlined in Annex C.
- Deliver training to workers and in communities to raise awareness about the symptoms and risks of COVID-19, preventative measures, and emergency response protocols in the event of an outbreak.
- Promote good hygiene practices in the workplace, the camp, and in communities/at home such as hand washing (with clean / boiled and cooled water and soap, for at least 20 seconds), regular cleaning and disinfection of surfaces, use of hand sanitisers, and coughing or sneezing into elbows, and avoiding touching eyes, nose and mouth.
- Assist SIG in educating the community on the symptoms of COVID-19 (in a manner consistent with public health messaging), including how to decide whether or not to go to work/school/leave home, or stay home and seek help.
- Stockpile Personal Protective Equipment (PPE) (e.g. N95 rated face masks and surgical face masks; disposable gloves and coveralls; face shields; hand sanitiser; rapid COVID-19 testing kits) to supply the Project workforce for at least one month
- Prepare and communicate a plan to seek additional health assistance, and establish communication hierarchies to keep people informed in the event of an outbreak. This could potentially be developed further for communities via the Community Benefit Share Project (CBSP), including gaining access to PPE and cleaning supplies, clean water etc. Opportunities to use Project networks to assist communities with the COVID-19 response will be discussed and evaluated by the TRHDP COVID-19 Working Group (described further in Annex C).
- Set aside temporary facilities to house workers who contract the virus, so that they can be isolated from the rest of the workforce and community populations.

- Restrict access to and from the Project DIA and workers' camp, through security measures such as barrier gates at the entrance to the DIA, security patrols around active work areas, and limiting visitor access to the camp and work site (with strict records kept to allow for rapid contact tracing where required).
- Prepare a plan to lockdown the Project DIA and workers' camp in the event of an outbreak in nearby communities, or in the Project workforce.
- Provide ways for workers to continue working remotely from off-site, in the event of a Project or local/regional lockdown. This would only apply to office-based workers or skilled workers who are able to carry out their duties (such as administrative tasks) remotely, rather than on site.
- Establish a contingency plan for unskilled workers/construction labourers who could be unable to work on site in the event of a lockdown. This includes setting expectations for continued remuneration/financial support, or options for retrenchment (and the conditions under which this would be necessary), and a plan to communicate messages relating to employment to the workforce when they are located remotely from the site (e.g. at home).
- Scheduling work shifts and meetings to a) minimise the number of people gathering at any one time (and to maximise the chances of successful physical distancing) and b) to build in a contingency of 'back up' shifts to keep the Project operational in the event that multiple workers contract COVID-19 at once.
- Consistent with the requirements of the SIG, all foreign workers (including contractors, sub-contractors and consultants) are required to have been through the full COVID-19 vaccination course prior to leaving their home country. This includes any period after the second vaccination required for it to be fully effective and vaccination considered complete. All workers are encouraged to get vaccinated. Workers will be entitled for paid time off for break from work to get vaccination as well as rest after dose.

1.4.4 Identified health services

The following locations have been identified as approved quarantine facilities, managed by SIG:

- National Referral Hospital Isolation Unit is being used for positive cases.
- King Solomon Hotel, Point Cruz
- Heritage Park Hotel, Mendana Avenue
- Pacific Casino Hotel, Kukum Highway
- Guadalcanal Beach Resort, Henderson
- Vimo Apartment, Henderson
- Access Unit, Henderson
- Airport Motel, Henderson
- Chengs, Henderson

COVID-19 testing is also being done at these facilities during the quarantine tenure. Further testing of outgoing passengers is conducted at National Referral Hospital before departure.

This information was current as of November 2020 but is subject to change as the situation develops.

1.4.5 Mobilisation, quarantine and testing protocols

It is anticipated that quarantine and testing requirements may change as the pandemic evolves. The following protocols have been established by SIG, and HEC has agreed the approach with SIG in relation

to screening, testing, quarantine and/or isolation of Project workers. These testing arrangements changes from time to time depending upon the enforcement of travel advisories and risk evaluation by the Oversight Committee (OSC) of Solomon Island Government.

Prior to mobilisation of HEC employees (from overseas to Solomon Islands)

The HEC Administration Team (led by HR and Administration Managers) shall ensure that every practical effort has been made to provide for the following:

- That personnel are healthy and ready for work before being brought in to Solomon Islands. As of now, The Solomon Island Government has stated conditions of being tested with Rapid Testing (RT) Polymerase Chain Reaction (PCR) test prior to entering. For High risk countries[23], three negative RT PCR tests needs to be endorsed (first-18 to 21days, second-8 to 11days third-72 hours prior to departure), while low risk countries require two(second and third only)
- All necessary housing and transportation have been arranged. Since the personnel being brought in are to be in paid Quarantine centres, arrangements have to be made with the Hotel and the authorities for accommodation. The Booking information is provided to the OSC as a part of pre departure information.
- Availability of food service to the personnel in quarantine is ensured in communication with the Quarantine Centre/Hotel. Further, delivery of water, dry food for emergency use and other essentials like sim card, toiletries, sanitizers are delivered to the Quarantine Centre and kept at the respective rooms prior to their arrival.
- For the regular food materials, HEC has secured 6 months' worth of food supplies through cargo ship, imported from Korea. The canteen will be operated only for non-local workers. The Administration Team can organised for packed meals to be made available to local workers from the canteen if required.
- Further, HEC is procuring vegetables and perishable foods from Korean restaurants/Food supplier in Honiara, and they get their supplies from a number of local suppliers and open market. They can meet HEC's requirements for food materials in terms of quantity and availability. The suppliers have been well informed about this kind of scenario which may arise.
- Acquisition of all required PPE, First-Aid response kits and consumables

Quarantine of workers arriving in the Solomon Islands from overseas

- The HEC HSE Manager shall maintain contact with Guadalcanal Province - Health Promotion team and the MHMS Emergency Health and Surveillance Unit regarding the rapidly changing COVID-19 protocols and COVID-19 testing arrangements and locations.
- Prior approval will be sought from the Prime Minister's Office for entry of foreign employees into the Solomon Islands through scheduled repatriation flights. A list of approved travellers will be published in the Official Gazzette, after which a ticket can be booked on a scheduled flight.
- It is mandatory for people arriving into the country to be quarantined at the government approved Quarantine facility for between 14 to 24 days depending on the risk category of Countries from which the passenger travelled or transited

[23] The high risk and low risk countries are changed from time to time, the list is governed by Travel Advisories enacted by the Solomon Islands Government. The risk level is set by the SI government Ministry of Health and is reviewed on a fortnightly basis.

- People quarantined in an approved facility will be tested by MHMS according to the 'Quarantine period and testing requirements' as per Part 3 Section 20-23 of Emergency Powers(COVID-19)(No 3) (Amendment No 2) Regulation 2020. Currently the usual approach for personnel travelling from high risk countries is to quarantine for 3 weeks, with testing conducted as follows:
    - Test No 1upon entry into a quarantine facility
    - Test No 2: after 1 week from start of quarantine period
    - Test No 3: after 2 weeks from start of quarantine period
    - Test No 4: 2 ~ 3 days before end of quarantine period

Screening before starting work (after quarantine is complete)

- After the quarantine period, and prior to being deployed to remote job sites, personnel shall be screened for any current symptoms (i.e. fever, dry cough, difficulty in breathing, and/or fatigue) and body temperature (shall be less than 37.5°C).
- Personnel who do not pass the screening criteria shall not be allowed to mobilize to the Project work site and shall remain in isolation at an accommodation secured by HEC, located near Henderson airport. This accommodation facility can house three people at any one time, until they are clear from any symptoms, and have tested negative and have been deemed safe to return to work by a medical professional (e.g. the Project Doctor, Dr. Pedical).
- When the workers' camp is occupied and seeing an increased occupancy after the start of construction, a dedicated building within the workers' camp (likely the HEC Local House, which will not be occupied until peak dam construction) can be used for isolation of suspected cases within the camp.
- Dr. Pedical can be called on for consultation and support during isolation; if further assistance is required, it shall be sought from the National Referral Hospital. Until the health clinic is established on-site at the temporary office, Project employees will be sent to Dr Pedical's existing practice clinic located at Capital Park, Honiara for regular health check-up and consultations (whenever required). This is in the same building as HEC's office (pre-construction).

Ongoing monitoring of the workforce

- Site Supervisors shall remain diligent in ensuring that personnel are healthy and fit for work and shall remove, quarantine and report any employee who exhibits the above symptoms.
- Two thermal imaging cameras have been installed at the HEC office (Honiara, and eventually the temporary site office) which monitor body temperature automatically. Every morning all the employees are scanned for temperature using a contactless Infra-red thermometer prior to entering into the office.

Protocols for everyone in the Solomon Islands (including general public):

People who have travelled to an area where COVID-19 has been reported (e.g. if community transmission begins to occur in the Solomon Islands); or who have been in close contact with someone who has travelled to any affected location or had symptoms of COVID-19 are instructed to **phone the Public Health Emergency Surveillance Unit on 23650 or 7522202**, avoid using public transport, and maintain physical distance of at least 1 m from other people at all times.

1.5 *Interaction between the Project and Public Health Services*

Throughout the socio-economic baseline survey conducted at the end of October to early November 2021, baseline health conditions, healthcare services and its access have been collected to support the impact assessment and development of Socio-economic Monitoring Framework. Various key informants were consulted including healthcare workers in order to identify community's current socio-economic status and priority needs, which include healthcare systems.

HEC had joined several meetings and workshops to build linkages with the stakeholders covering a wide range of subjects like Malaria prevention, COVID-19 and to discuss about issues related to emergency communications during an outbreak. It is noted that HEC is not only focusing on workers health but also on the community health aspects. HEC engaged with MHMS in August and September 2020 to gain an understanding of the current information available about the health of the local population affected by the Project, and available health services. As a result, two agreements between HEC/THL/PO with MHMS have been made, namely:

- COVID-19 Protocol for Workplace; and
- Vector Surveillance.

The COVID-19 Protocol provides a detailed procedure for preparation against COVID-19, which will require the Project to collaborate with all stakeholders as well as public health partners to respond to the situation. It also has information on Community Awareness Programme conducted by the Guadalcanal Provincial Health Emergency Operations Centre (HPHEOC).

The Vector Surveillance Agreement has been signed between HEC/THL/PO with MHMS, particularly the Vector Surveillance divisions of Centre and Guadalcanal Province. Information exchange throughout the discussion process with MHMS includes:

- The various vector surveillance arrangement in place;
- The monitoring measures that are being carried out at various levels;
- The control measures, frequency and its effectiveness.

The agreement also sets out the Project participation on Vector Surveillance, Monitoring and Control in various aspects such as:

- Awareness to communities and workers;
- Monitoring of diseases of workers;
- Monitoring of community health;
- Control measures for Malaria and vector borne diseases in workers camp;
- Control measures for communities;
- Community health infrastructure development programme.

Both the agreements include detailed emergency contact information of various potential involving stakeholders including:

- Ministry of Health and Medical Services;
- HEC;
- PO; and
- THL.

Much of the information gleaned through these discussions has been incorporated into the CHVDMP. It has been agreed that HEC will maintain regular communications with MHMS, predominantly with Dr Churchill Pedical and his nursing staff acting as an intermediary.

A similar relationship will be maintained with St John Ambulance Service (for the provision of paramedic care and transport services in the event of multiple casualties/catastrophic incident amongst the Project workforce or affected communities) . HEC will operate its own ambulance from the health clinic at the office site, which will be on stand by for emergencies involving only one or two patients.

HEC and THL (with occasional support by Project Office, namely to utilise existing networks within SIG) will also liaise with the following agencies from time to time, for various activities such as to develop community awareness training programmes (as described in the IMP, HRLMP and WHSP):

- Solomon Islands Red Cross (first aid training and emergency response advice)
- Solomon Islands Planned Parenthood Association (advising on sexual health and contraceptive use education/preventative actions; hygiene behaviour)
- Seif Ples (gender-based violence crisis and referral centre in Honiara, supported by the Royal Solomon Islands Police Force)
- Ministry for Women, Youth, Children and Family Affairs (training, awareness and support programs targeted to women and young people in Project-affected communities, and women in the workforce)
- Guadalcanal Provincial Health Department: Malaria Department (malaria-related controls and information) and Field Officers (general community health support and advice to inform the practical and appropriate implementation of the controls detailed in this CHDVMP)
- National Vector Surveillance Unit (preventative measures and communicable disease incidence monitoring)

ANNEX P-10-II Community Health Context

ANNEX P-10-II COMMUNITY HEALTH CONTEXT

This annex provides a summary of the community health setting in which the project is based, including:

- The current status of public health services in Guadalcanal Province;
- Most recent population health statistics, including incidence of a range of communicable and non-communicable diseases and trends for relevant lifestyle factors; and
- The current status of communities affected by the Project gleaned from various household surveys commissioned by both HEC and PO in 2020 and 2021.

This information has been collated from predominantly secondary sources, aside from the household survey. Comprehensive statistics for public health trends in the immediate Project area are difficult to obtain, due to limited resourcing within the public health system and poor accessibility to some communities. However, this section presents as complete a baseline as is possible with the information available.

The key primary data reference point is the social survey commissioned by the PO, carried out during August and September 2020, with the final report being provided in April 2021. This was undertaken by Fitzgerald Applied Sociology and included analysis of key health determinants. In conjunction with the previous household survey undertaken by HEC in August 2020, provide an appropriately detailed record of baseline conditions in the Project-affected population.

Note: Definitions for key terms such as 'communicable' and 'non-communicable' used in this section have been provided in Section 1.2 above.

1.1 EXISTING PUBLIC HEALTH SERVICES

National health services are funded, managed and regulated across the Solomon Islands by the Ministry of Health and Medical Services (MHMS). The MHMS provides maternal and child health, family planning, dental services, mental health, and immunisation services. Health services are delivered in each Province by provincial health offices. MHMS has a health statistics unit that collects monthly reports from primary health facilities; this data is managed in the District Health Information System (DHIS) database. Data has been collected since at least 2005.

The country's only full-service hospital, the National Referral Hospital (NRH), is the largest in the Solomon Islands located in the capital Honiara. The NRH provides ear nose and throat, plastic surgery, paediatric surgery, vascular surgery, cardiology and cardiac surgery services. It also provides specialised services like Emergency Department, Orthopaedic Department, Ophthalmology Department, General Surgery Department and Obstetrics and Gynaecology. The hospital has over 300 beds and operates with over 50 doctors (Source: Specialised Medical Service – My SIG Services Portal (solomons.gov.sb). The NRH is the final pathway for patients requiring urgent emergency care. In the past, a system operated whereby seriously ill patients were transferred to St Vincent's Hospital in Sydney, Australia, however this was no longer operating effectively as of 2015 (WHO 2015, p77). As a result, waiting lists to receive specialist tertiary care for serious illness outside of the Solomon Islands are considerably long.

The National Medical Store is a central repository which supplies the NRH and all provincial health offices and clinics with pharmaceuticals, medical equipment and consumables.

The levels of care available to members of the public in the Solomon Islands are as follows (with '1' being the most basic of care):

- Level 1: Nurse aid post
- Level 2: Rural health clinic (supervise multiple nurse aide posts in rural areas; staffed by a registered nurse and a nurse aide)
- Level 3: Area health centre (typically staffed by at least two registered nurses, one of whom may be a trained midwife)
- Level 4: Provincial hospital
- Level 5: National Referral Hospital

The NRH also serves as the Provincial hospital for Guadalcanal Province. There is one other hospital in Guadalcanal, the Good Samaritan Hospital, which is a non-state service provider (build by Amici Missione Isole Solomon (AMIS) and supported by the Pieta Sisters of Solomons).

There are six areas in Guadalcanal Province across which health statistics are recorded and analysed by MHMS (known as 'Health Information System (HIS) units'), including:

1. Aola
2. Avuavu
3. **Grove (the Project is located in this area)**
4. Marara
5. Marau
6. Tangarare

Current known facilities within the Grove area are summarised in Table 1. While some of the distances between the Project area may seem convenient to persons unfamiliar with the area, in reality travel can be extremely challenging, especially for people living in the mid to upper reaches of the Tina River catchment. Guadalcanal Island has a mountainous interior, and roads and tracks are generally in very poor condition even in built-up areas. In the wet season, roads become even more treacherous and often impassable either due to landslides, loss of traction for vehicles, or flood waters. The PO social baseline survey evaluated household accessibility to the health facilities and are presented in detail within Chapter Three. The findings, expressed as minutes rather than kilometres, indicates that on average, it takes over one hour for residents within the Core Area of the Project to access the nearest nursing station, with a travel of nearly two hours required to access the nearest doctor.

Table 1 List of known health facilities in Grove area (obtained from Chief Medical Statistician, MHMS, November 2020)

Facility type	Location(s)	Comments	Approx. distance from Project area (straight line) in km
Level 3 (Area Health Centre)	Good Samaritan Hospital, Tetere	Privately operated (mission hospital)	15
Level 2 (Rural Health Clinic)	Turarana	Status unconfirmed	7
	Ngalimbiu	Operated by GPPOL	15
	Tetere	Operated by GPPOL	15
	Kolosulu	Status unconfirmed	30
Level 1 (Nurse Aid Post)	Haiparia	Status unconfirmed	30
	Konga	Non operational as of ~Feb 2020 (anecdotal)	10
	Lungga	Status unconfirmed	15
	Numbu	Status unconfirmed	25
	Tinagulu	Status unconfirmed	10
	Balasuna	Operated by GPPOL	20

To service the Project workforce, a health clinic will be established within the Project Direct Impact Area (DIA) precisely at the Project Office site. This service is provided in order to avoid placing an additional burden (i.e., the Project workforce) on the local health system, which is already under pressure. The clinic will not be open to the general public. It will be a six-bed medical facility staffed by a team of at least two registered nurses (certified by MHMS). The facility will be equipped to provide basic first aid and primary care; in the event of an emergency or severe injury, patients will be transported to the NRH by on-site ambulance. The facility will be supervised by a General Practitioner, Dr Churchill Pedical, who will visit at least weekly for scheduled appointments and to oversee the operations of the clinic. Dr Pedical has an established general practice in Honiara. Once it is constructed, the health clinic will be inspected by MHMS (Infrastructure Division) before becoming operational. Further details on the clinic are available in the Project Workers' Health and Safety Plan (WHSP).

With the ongoing pandemic situation due to COVID 19, The National Referral Hospital provides routine testing for incoming and outgoing passengers through its Molecular Laboratory, which specialises in performing RT PCR tests. The positive cases of COVID 19 are quarantined at the Isolation Unit of NRH.

The Ministry of Health and Medical services continue to provide the COVID 19 vaccines for the Guadalcanal Province at the Central Field Hospital, an extension facility of the National Referral Hospital.

1.2 TRENDS IN POPULATION HEALTH

This section provides a quantitative and qualitative assessment of baseline population health within the area local to the Project, Guadalcanal Province, and the Solomon Islands generally, prior to the start of construction. The assessment has been prepared on the basis of the best information publicly available at the time of writing, being August 2021. It is recognised that there are significant limitations around

the availability of some data, particularly for more socially sensitive topics such as mental health, sexual health, and domestic violence. These limitations are identified in the text below, where they are material to the interpretation provided.

Statistics on population health are collected by MHMS and the Guadalcanal Province Health Department and reported to local (sub-provincial) scale, but not to the scale of individual communities. National statistics for the Solomon Islands are also reported to and analysed by the World Health Organisation (WHO) and the World Bank, among other international organisations. Annual health report cards and online databases such as the WHO Global Health Observatory and World Bank data on health indicators also provide further sources of quantitative data. Overall trends across various metrics for communicable and non-communicable diseases have been identified on the basis of this secondary- or tertiary-sourced information.

Key resources referenced in the following sections include:

- UN ESCAP 2012 *Disability at a Glance 2012: Strengthening the evidence base in Asia and the Pacific*, United Nations Economic and Social Commission for Asia and the Pacific, Social Development Division, Bangkok, September 2012, 166pp.[1]
- WHO 2015 'Solomon Islands Health System Review', *Health Systems in Transition*, Vol. 5 No. 1, 2015, Asia Pacific Observatory on Health Systems and Policies, World Health Organisation, 146pp.
- United Nations Population Fund *Solomon Islands Sexual and Reproductive Health Rights Needs Assessment* April 2015
- Marks M, Kako H, Butcher R, et al *Prevalence of sexually transmitted infections in female clinic attendees in Honiara, Solomon Islands* BMJ Open 2015
- WHO 2018 'Solomon Islands' in *Noncommunicable Diseases Country Profiles 2018*, World Health Organisation, Geneva, 224pp.
- WHO 2020 'Solomon Islands' country page, *World Health Data Platform, The Global Health Observatory*, World Health Organisation, accessed online at https://www.who.int/data/gho/data/countries/country-details/GHO/solomon-islands?countryProfileId=b4905c96-38a0-4581-94aa-9248b10f9789 , 18 November 2020.
- MHMS 2019 *Guadalcanal Province Health Profile 2019*, obtained via personal communication from Chief Medical Statistician, Ministry of Health and Medical Services, Solomon Islands Government, to HEC on 17 November 2020, 26pp.

In addition to these validated data, a household-based health survey was completed by HEC's Project doctor (accompanied by staff from THL and the Project Office) during August 2020, and a social survey commissioned by the Project Office was also undertaken across all Project-affected communities in September 2020. The findings of both have been consolidated and are presented in Section 1.3 below

It is anticipated that further targeted community health surveys and longer term monitoring will be required against baseline conditions and to track any emerging health trend which could be attributable

[1] Majority of data for Solomon Islands sourced from MHMS Community Based Rehabilitation Unit, 2011

to the Project. The approach for these are largely driven by the Social Impact Monitoring Plan (SIMP) prepared by the Project Office and integrated into this plan as appropriate.

1.2.1 Demographics

This section provides a brief overview of the population in Guadalcanal Province, with a specific focus on factors contributing to trends in population health. An in-depth analysis of the demographics within the Project area is given in the Project Influx Management Plan (IMP), on the basis of information collected to inform the Environmental and Social Impact Assessment and from national census data.

The overall population within the Project area (including downstream communities) was approximately 1,800 people as of 2013. As identified by the PO-led socio-economic baseline assessment, given that the 2019 national census results have not yet been released, there is no reliable official data on the local population, its characteristics and trends. A useful overall indicator is the 2015 Tribal Register of all members of the 27 recognised Malango tribes, with a focus on the five tribes owning the Core Land acquired by SIG for the project. This tribal registration indicates a population of some 3,465 persons.

The population of Guadalcanal Province was 115,143 in 2019 (bearing in mind this also includes the nation's capital Honiara, which is densely populated). The national population was estimated at 642,000 in 2015.[2]

Nationally, the Solomon Islands has a predominantly young population, with 39.3% of the total population aged 14 or under in the 2013 national census.

In 2012, the life expectancy at birth was 66 years (males) and 69 years (females) (WHO 2012 and World Bank 2012a, in WHO 2015, Table 1-4, p11).

In approximately one third of households nationally, children under the age of 18 were living without the presence of their biological mother or father (SISO, 2007 in WHO, 2015, p3).

1.2.2 Maternal and new-born health

Maternal deaths are a widely used indicator of the quality and availability of health services to support mothers prior to, during, and after delivery, especially when looking at trends in a smaller population. A total of four maternal deaths were reported in Guadalcanal Province in each of 2018 and 2019; prior to this, there were only 1 or 2 deaths reported per year (2015 to 2017). According to MHMS, it is challenging to report maternal deaths, as it is highly likely that they are underreported by the community (compared with other causes of death). The same challenge is experienced for reporting of neonatal deaths (described below).

The following child mortality rates were elevated in 2019 compared to 2018 in Guadalcanal Province, with the Grove area accounting for a high proportion of deaths across all three metrics:

- **Neonatal Mortality Rate** (NMR; probability that a child will die during the first 28 days of life, per 1,000 live births) = 13 in 2019 (2018 = 8).
- **Infant Mortality Rate** (probability of dying between birth and age 1 year, per 1,000 live births) = 20 in 2019 (2018 = 16)

[2] Solomon Islands National Statistics Office website, accessed 18 November 2020; this estimate was formulated in between census years (2013 and 2019); census data not yet publicly available for 2019, as of Nov 2020.

- **Under-five Mortality Rate** (probability of dying before age 5 per 1,000 live births) = 29 in 2019 (2018 = 28)

Access to Antenatal Care dropped very slightly from 5.8 to 5.2 between 2018 and 2019. This means that a woman in Guadalcanal Province would complete an average of 5.2 visits to antenatal care services prior to giving birth in a given year. Of the six reporting areas, Grove has the lowest rate of access at only 3.7 visits on average prior to delivery (2019). It was estimated that 18% of births were unsupervised in Grove in 2019 (25.3% for Guadalcanal Province). These births were not attended by a skilled health worker such as a doctor, nurse, nurse aide or midwife. The proportion of unsupervised births was higher across the other five areas in Guadalcanal Province.

Based on the above, it appears that newborn and infant health declined between 2018 and 2019, particularly in Grove. This was likely related, at least in part, to the decline in access to suitable maternal health services, including antenatal and post-natal care. However, there are limitations within the dataset and so this trend should be considered as indicative only.

1.2.3 Nutrition and lifestyle

The first survey on non-communicable diseases was completed in the Solomon Islands during 2005 – 2006; undertaken by the WHO using a STEPwise Approach to NCD Risk Factor (STEPS) survey. In the survey, 31% of the population reported that they smoked daily, and approximately 94% of the population reported consuming less than five combined daily servings of fruit and vegetables (WHO 2010, in WHO 2015, p11). The mean salt intake of the population was estimated at 6 grams/day (adults aged 20+; WHO 2018). This is higher than the recommended daily intake of sodium (<2 grams/day of sodium; or 5 grams/day of salt).

The 2018 WHO country profile for the Solomon Islands stated that 25% of females and 16% of males over the age of 18 were considered to be obese; however, only 4% of all children aged 10-19 were obese.

In Guadalcanal Province, it has been estimated that 9.7% of children aged less than 2 years old were classified as 'malnourished' (weighing ≤80% of weight for age).

Sanitation and water supply

Extensive surveys have been conducted across Project-affected communities to inform a Water Supply Replacement Plan (WSRP; C7) for the Project; these surveys are ongoing. Detailed analysis of the demand and supply of potable and non-potable water across these communities can be found in the WSRP, but the findings to date can be briefly summarised as follows:

- None of the communities have a reticulated, treated water supply or reticulated wastewater collection and treatment system.
- Most villages use a combination of one or more water sources and collection methods, for different purposes, from wells and bores (hand pump, or solar or diesel-powered) to rainwater tanks, groundwater- and surface water-fed springs, streams, and the Tina River itself.
- Use of the Tina River is seasonally dependent; during periods of flooding, it is too dangerous to gain access, and water turbidity is poor.

- It was estimated that there could be up to 200 rainwater tanks across Central Guadalcanal, from field observations. Tanks of 5,000 L capacity are readily available and as such are most commonly used in villages either communally or for private dwellings.
- Collection of water is typically the responsibility of women and children.
- Access to water sources can be challenging, and the degree of challenge varies between villages. Risks identified by the communities included steep dirt tracks which become treacherous after rain; makeshift bridges and fallen trees; chronic musculoskeletal injuries caused by continual manual labour (particularly for women), and aggressive or poisonous animals including snakes and centipedes.
- The existing quality of water in the Tina River has been found to exceed WHO guidelines for drinking water (for faecal bacteria indicators) prior to construction. It can be reasonably expected that this has contributed to the incidence of gastro-intestinal illness in the communities using the Tina River as a source of drinking water.

In addition to the above, there is no municipal wastewater treatment plant on Guadalcanal Island. There are some on-site septic systems, mostly in the areas closest to Honiara or in more developed/modern settlements, but otherwise human waste is disposed of via ground soakage, or pit latrines and open defecation (particularly in very remote communities).

From these findings, it can be assumed that access to safe and reliable sources of drinking water, and water for non-potable uses (such as personal hygiene/bathing, laundry and cleaning) is by no means guaranteed, and is highly variable across the communities.

These conditions were reflected in national statistics for water and sanitation (WHO 2018), as follows:

- 9% of households (nationally) had access to a reticulated drinking water supply; the majority relied on a communal standpipe (35%) or a river/stream (25%).
- 12% of households had access to a flushing toilet (private or shared).

1.2.4 Disabilities and special needs

Detailed national statistics on the prevalence of disabilities and the health status of people with special needs in the Solomon Islands are extremely limited, because the national census has historically not included disability disaggregated data to a high level of detail. However, starting with the 2019 census, SIG will be including the Washington group Short Set of Questions on Disability, so it is anticipated that further data will become available in Years 1 and 2 of project construction (2021 – 2022) once the 2019 census results are publicly available.

From international reports (UN ESCAP 2012), it has been estimated that the Solomon Islands:

- Has a prevalence rate of 2.9% of the total population with some form of disability. This equated to approximately 14,403 people with disabilities in 2012; 45% of which were female.
- Of the people with disabilities:
    - 28.4% were physically disabled;
    - 27.4% were visually disabled;
    - 17.5% were hearing impaired;
    - 2.8% were mentally disabled;
    - 5.4% were intellectually disabled; and

- 18.7% had 'other' forms of disability.

The Solomon Islands has a typically had a very limited budget available for disability expenditure compared to other Pacific nations, at less than 0.002% of GDP (PDF 2015).[3] There is no formal system for long-term care of the elderly or disabled people in the Solomon Islands (WHO 2015, p79). Short term care is available via the Community Based Rehabilitation (CBR) programme, for people who have been disabled by disease, traumatic injury, or another cause. Care is typically provided through home visits by a team of field workers, and physiotherapists based out of the NRH in Honiara.

1.2.5 Non-communicable diseases

Drug addiction / dependency

Drug addiction and dependency, and related health issues, are recognised by health practitioners as a significant issue in the Solomon Islands anecdotally (refer to Section 2.3), however very little research has been conducted on this topic specifically regarding its impact on the health of the Solomon Islands population.[4]

Alcohol and marijuana are the primary drugs of concern. A 2011 survey found that a minority of the survey sample had ever used marijuana (14%; GSHS 2011 in Save the Children 2016, p13), however in another survey conducted by Save the Children in 2016, 48% of the total sample of young people had ever used the drug. According to the WHO 2018 country profile, total alcohol per capita consumption in the Solomon Islands equated to 1 litre of pure alcohol per year in 2016 (adults aged 15+). The worldwide average was 6.4 litres per person in the same year.

Alcohol can be legally purchased from bottleshops, bars, nightclubs and restaurants. This includes locally-brewed beer (e.g., Solbrew and the stronger Special Brew (SB)), imported beers, wine, hard liquor ('hotstaf' in Pijin; e.g. gin, vodka, whisky) and premixed drinks. Illegal forms of alcohol include homebrew, prepared from the fermentation of sugar, yeast and fruit juice in water, and *kwaso*, which is distilled from homebrew and as such as a very high alcohol concentration. Both of these illegal forms are popular with low-income earners, unemployed people and youths because they are cheaper than legal alcohol.

The health risks associated with harmful alcohol use include a wide range of toxic effects on the digestive and cardiovascular systems, and increase risk of developing multiple types of cancer. Alcohol suppresses the immune system and can therefore increase the risk of contracting communicable diseases such as HIV and tuberculosis. The effects of alcohol on behaviour (e.g. impaired judgement, ability to react when driving) and mental health also have secondary effects such as increased road accidents (when drivers are under the influence of alcohol), risky behaviour and social harms (multiple sexual partners, unsafe sex, violence and self-harm), and adverse effects on the ability to work and maintain healthy relationships.

Betel nut is commonly used in the population; in a survey conducted by WHO in 2005-2006, it was reported that 78% of males aged 15-24 years old had chewed betel nut in the past year (compared to

[3] PDF 2015 Figure 2, in SDG-CRPD Monitoring report 2018: Full Report, From recognition to realisation of rights: Furthering effective partnership for an inclusive Pacific 2030, Pacific Disability Forum, Suva, Fiji, 2018.

[4] Save the Children 2016 Alcohol, other substance use and related harms among young people in the Solomon Islands, January 2016, Save the Children (study funded by Australian Aid / Australian Department of Foreign Affairs and Trade) and undertaken by the Burnet Institute), available online https://www.savethechildren.org.au/getmedia/420da8b2-c77b-4668-a1e4-0be8441dcc32/SLB_Substance-Use_2016.pdf.aspx, accessed 20 November 2020.

66% of females in the same age group). The average age of first betel nut use was approximately 21 years for males and 22 years for females. Betel nut is the seed of a fruit of the areca palm, which is widely grown in the Solomon Islands. It is a stimulant, and is typically ingested via chewing inside a betel leaf with slaked lime powder or crushed shells. Acute effects of betel nut use can include:

- Euphoria
- Increased alertness
- Increased heart rate and/or palpitations, high blood pressure
- Sweating

Long-term use can cause chronic health effects such as mouth ulcers; gum disease; oral cancers; stomach ulcer; heart disease; dependence, and associated work, financial and social problems.[5]

Family and Sexual Violence

The Solomon Islands has one of the highest rates of family and sexual violence (FSV) in the world, with a January 2016 study noting that 64% of women aged 15-49 have reported physical or sexual abuse by a partner[6]. This has been historically under reported and patients who have reported FSV were not treated or managed appropriately, largely due to time pressures and overcrowding within the hospital systems, including the National Referral Hospital in Honiara.

Strategies have recently commenced to improve reporting of FSV, and the medical and psychological treatment of FSV citims. This has also been accompanied by regulatory changes through the Family Protection Act (2014) and the role of the Royal Solomon Islands Police Force (RSIPF) in establishing Seif Ples. This clinic is based in Honiara and provides specially trained nurses to provide medical treatment and onward referral for clients.

Respiratory illnesses

Lower respiratory infections are the 3rd highest contributor to lower life expectancy (premature mortality) in the Solomon Islands.[7] Asthma is ranked ninth, and affects the younger population (people aged 24 years and under) more than the older population.

In 2019, 387 children per 1,000 people in the Grove area (aged 0-59 months) had acute respiratory infections and were taken to an appropriate health-care provider. This indicator is used as a proxy to measure the incidence of suspected Pneumonia in children aged under 5 years old. This was close to the average of 390 children per 1,000 population across the wider Province. Overall, this metric has reduced since 2015. Similar data for the adult populations is limited, particularly recent data (within five years prior to 2020).

[5] ADF 2020 'What is betel nut?', 6 October 2020, Alcohol and Drug Foundation (Australia), available online at https://adf.org.au/drug-facts/betel-nut/, accessed 20 November 2020

[6] (PDF) Domestic violence in the Solomon Islands (researchgate.net)

[7] Institute for Health Metrics and Evaluation 2010 Global Burden of Diseases (GBD) Profile: Solomon Islands, 2010, available online at http://www.healthdata.org/sites/default/files/files/country_profiles/GBD/ihme_gbd_country_report_solomon_islands.pdf, accessed 20 November 2020.

In August 2020, five new medical ventilators were donated to MHMS by the Australian Government, WHO, and the United Nations Development Program.[8] Ventilators provide artificial respiration via the mechanical movement of the lung, to treat patients who cannot breathe on their own as a result of severe respiratory conditions. This is a significant resource not previously held by MHMS, and is a huge step forward in the level of preparedness for COVID-19 (see Section 1.4).

Diabetes

Diabetes (Diabetes mellitus) is a chronic disease characterised by elevated blood glucose levels, caused by the body's reduced ability to make insulin (and regulate blood glucose). The two predominant types of diabetes are Type 1 (an incurable form of diabetes, where the pancreas produces little or no insulin by itself, and so patients are fully dependent on receiving synthetic insulin to manage the condition) and Type 2 (where the body becomes resistant to or doesn't make enough insulin). Type 2 is the most prevalent form of diabetes, and the development and treatment of the condition is predominantly influenced by lifestyle factors such as excess body weight and lack of physical activity.

Prolonged, elevated blood glucose leads to severe damage to the heart, blood vessels, eyes, kidneys and nervous system.[9] These complications can mean that patients require a higher level of health care, over a prolonged period.

The Non-communicable Disease Country Profile for Solomon Islands (WHO, 2018)[10] stated that 11% of all adults (aged 18+) had raised blood glucose levels. This is relatively high in comparison with the global average in 2014 (9%) and with other countries in 2018. The proportion of females with raised glucose was 2% higher than that of males.

On a local scale, 20.1% of non-communicable disease patients presented at health facilities with diabetes[11] in the Grove area (22.4% across Guadalcanal Province) in 2019. The presentation rate for diabetes has increased annually over the past five years from only 6.3% in Guadalcanal in 2015. This indicates the increasing significance of diabetes as a condition of concern for the local area (and the Solomon Islands in general), placing an additional burden on the health system.

Heart disease, hypertension and other cardiovascular conditions

17% of adults (aged 18+) across the Solomon Islands had raised blood pressure in 2018 (WHO). Similarly, 17% of all adults over 18 were physically inactive; the proportion was much higher for females (22% physically inactive) than for males (12%).

While data on blood pressure trends is not available at a local scale (to the Project area), statistics are available for patients presenting with hypertension. The Grove area has one of the highest proportions of non-communicable disease patients presenting with hypertension in 2019 (44.1%, compared with 37.2% across Guadalcanal Province). However, this was lower than reported in 2018. MHMS reported

[8] UNDP 2020 'Five new medical ventilators officially handed over to the Solomon Islands Ministry of Health', 20 August 2020, United National Development Programme, Pacific Office in Fiji, available online https://www.pacific.undp.org/content/pacific/en/home/presscenter/pressreleases/2020/five-new-medical-ventilators-officially-handed-over-to-the-ministry-of-health.html, accessed 20 November 2020.

[9] WHO 2020 'Diabetes', 8 June 2020, World Health Organisation, available online at https://www.who.int/news-room/fact-sheets/detail/diabetes, accessed 20 November 2020.

[10] WHO 2018 Noncommunicable diseases country profiles 2018, World Health Organisation, available online at https://www.who.int/nmh/publications/ncd-profiles-2018/en/, accessed 16 November 2020, 223 pp.

[11] Statistics do not distinguish between presentation of patients with Type 1 (Insulin dependent), Type 2, or other types of diabetes

that this metric does not indicate prevalence of hypertension as such, but is a proxy for indicating the burden of hypertension-related disease placed on workloads at health facilities.

This, combined with behaviours such as heavy smoking, obesity and alcohol consumption, means that the risk and prevalence of heart disease (and the burden this places on already limited health services) is significant in the local adult population.

1.2.6 Communicable diseases

Malaria

Malaria is a disease caused by *Plasmodium* spp. parasites, carried by infected female *Anopheles* mosquitoes. There are five parasite species that cause malaria in humans; of these, *P. falciparum* and *P. vivax* pose the greatest threat. *Anopheles* mosquitoes are typically most active during the night. Once the parasite is transmitted to a person through a bite from an infected mosquito, it attacks red blood cells. Symptoms can appear within 7 days of the bite, and include fever and chills, headache, joint pain, loss of appetite, vomiting, and convulsions. Malaria can become severe and even fatal if diagnosis and treatment are delayed beyond 24 hours of first symptoms.[12]

Historically the incidence of malaria in the Solomon Islands was very high in the 1990s, with Annual Parasite Incidence (API) rate of 442 people in every 1,000 contracting the disease. This rate was reduced in the subsequent decade, but due to civil unrest in the early 2000s, government-funded programs experienced significant interruption. In 2015, the rate was successfully lowered to 40.5.[13]

The API rate for Malaria has increased since 2016, with 149.3 positive blood samples per 1,000 population in Grove for 2019 (MHMS 2019). This was noticeably higher than in previous years. Figure 1 below shows the number of confirmed cases reported across all areas in Guadalcanal, where it is obvious that Malaria has been most prevalent in the Grove area for all years between 2015 – 2019.

Nationally, malaria incidence has reduced from a rate of over 591 people per 1,000 people at risk (2000 – 2006) to below 319 since 2007 (WHO 2020). Approximately 1% of all deaths nationwide can be attributed to malaria, since 2012 (MHMS 2016, p50).

Dengue virus

Dengue is a virus carried by mosquitos (predominantly female mosquitos of the species *Aedes aegypti*, and less commonly the *Aedes albopictus* mosquito) and transmitted to humans via mosquito bites. *Aedes* spp. Mosquitoes are typically most active during the day. Dengue is a flu-like illness with symptoms including fever, skin rash, vomiting, severe headache, muscular pain and pain behind the eyes. Symptoms can last for 2-7 days, after an incubation period (after a bite from an infected mosquito) of 4-10 days. Dengue can be fatal if it becomes severe; there is no specific treatment. There are four 'serotypes' of dengue virus (DENV), meaning that a person could be infected with the virus four times.

Both type 1 (DENV1) and type 2 (DENV2) dengue viruses have circulated in the Solomon Islands in the past, particularly in populated areas like Honiara. DENV1 circulated around 2002, meaning that people aged under 18 years are likely to be more susceptible. It is thought that DENV2 circulated around 1994.

[12] WHO 2020 'Malaria', 14 January 2020, available online at https://www.who.int/news-room/fact-sheets/detail/malaria, accessed 19 November 2020

[13] MHMS 2016 *Solomon Islands Annual Malaria Program Report (2016)*, Ministry of Health and Medical Services National Vector Borne Diseases Control Program, Monitoring and Evaluation Unit, 2016, 84pp.

The last outbreak of dengue fever was experienced in 2016, with cases concentrated in Honiara and Guadalcanal. There were up to 7,000 suspected cases nationwide.[14] During the outbreak, rapid diagnostic testing was undertaken via the National Medical Laboratory.

Zika virus

The Zika virus is also transmitted by *Aedes* spp. Mosquitoes. Symptoms last for 3-7 days and include fever, rash, headache, conjunctivitis, and muscular and joint pain. According to the WHO, "Zika virus infection during pregnancy can cause infants to be born with microcephaly and other congenital malformations, known as congenital Zika syndrome. Infection with Zika virus is also associated with other complications of pregnancy including preterm birth and miscarriage."[15] There is no specific treatment available for Zika.

Zika was first detected in the Solomon Islands in 2015; some surveillance studies have been undertaken in the population by James Cook University (according to MHMS), but the results of those studies are not publicly available.

The National Surveillance Unit (within MHMS) undertakes surveillance activities for malaria and dengue fever at six 'sentinel' sites across the country, including one site in Guadalcanal Province. Monitoring includes:

- Larva studies
- Grab traps (dengue)
- Light and Ovitrap methods (malaria)
- Insecticide resistance checks

Further information on vector surveillance is provided in Section 5 below.

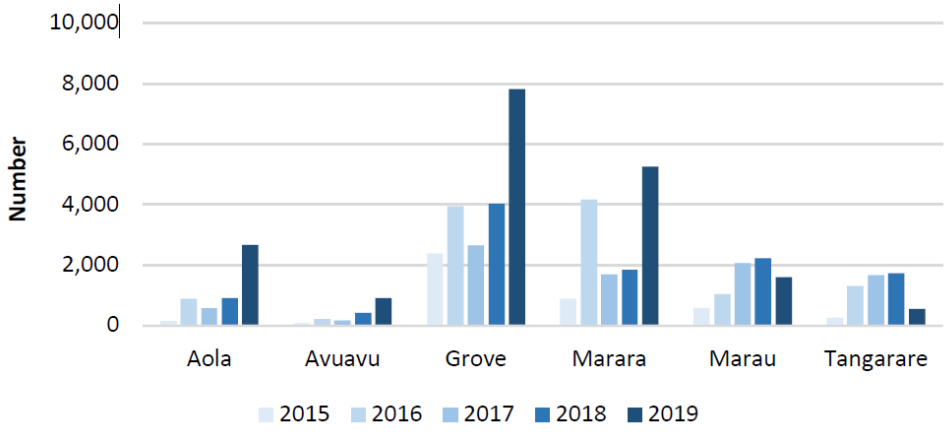


Figure 1 Total confirmed malaria cases by zone, Guadalcanal (2015-2016); Source: MHMS 2019, p11

[14] WHO 2020 'Dengue and severe dengue', available online at https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue, accessed 19 November 2020

[15] WHO 2018 ' Zika virus', 20 July 2018, available online at https://www.who.int/news-room/fact-sheets/detail/zika-virus, accessed 19 November 2020

Sexually Transmitted Diseases (STDs) and Sexually Transmitted Infections (STIs)

Data regarding the incidence of STDs and STIs at a local (provincial or lower) scale is very scarce. However, a report by UNAIDS (2018[16]) noted data provided by MHMS which recorded the following:

- 2,037 men reported urethral discharge, and 218 adults reported genital ulcers in 2014 (nationally)
- In a survey conducted in 2008, approximately 0.8% (from 240 total male respondents) reported having sex with other men in the previous 12 months.
- Guadalcanal Province reported the following incidence of STI cases via testing data in 2017:
    - 209 cases of Urethral Discharge Syndrome (plus 1,507 cases in Honiara)
    - 69 cases of Genital Ulcer Syndrome (plus 180 cases in Honiara)
    - 249 cases of Vaginal Discharge Syndrome (plus 1,713 cases in Honiara)
    - 230 Pregnancy VCCT (Voluntary Confidential Counselling and Testing) Pre-tests (plus 191 tests in Honiara)
    - It was noted that laboratory testing for Gonorrhoea was weak, with "syndromic management being the main course of management of the STI in the country" (p46)

In general, data regarding STIs, STDs, and sexual relationships is incredibly limited due to social stigma around sexual diversity, social desirability bias, and reluctance to self-report.

Knowledge of the symptoms and transmission pathways for HIV, STDs and STIs is limited, along with that of the consequences of unsafe sex practices (WHO 2013, in UNAIDS 2018).

MHMS implemented a human papillomavirus (HPV) vaccination programme for young females during 2015 and 2016, for the prevention of cervical cancer. In the Honiara City Council (HCC) administrative area, 71.8% of eligible girls were fully vaccinated; 11.6% only received a single dose. Coverage for girls in school at the time (in HCC area) was 77.4% (UNAIDS 2018, p48).

Human Immuno-deficiency Virus and Acquired Immune Deficiency Syndrome (HIV/AIDs)

Data relating to HIV/AIDs was not available from WHO (2020) for the Solomon Islands. The following information was obtained from a report published by UNAIDS (2018) using data provided by MHMS.[17]

UNAIDS classified Solomon Islands as having low prevalence of HIV (estimated at 0.002%) since 2010.[18] As of 2018, there were 12 people known to be living with HIV in the Solomon Islands (8 female, and 4 male). All of these people receive antiretroviral therapy.

In a Demographic Health Survey conducted by MHMS in 2015, 37% of female respondents and 49% of male respondents reported knowing where they could get an HIV test. This knowledge was found to increase with increasing levels of education and wealth, but was less common amongst people who had never married and had not yet become sexually active. The Guadalcanal province was identified as having the least levels of knowledge about where to get an HIV test, along with Malaita.

[16] UNAIDS 2018 Solomon Islands – Global AIDS Monitoring 2018, Monitoring the 2016 United National Political Declaration on Endings AIDS; Ministry of Health and Medical Services National HIV/STI Programme, Solomon Islands 50pp.

[17] UNAIDS 2018 Solomon Islands – Global AIDS Monitoring 2018, Monitoring the 2016 United National Political Declaration on Endings AIDS; Ministry of Health and Medical Services National HIV/STI Programme, Solomon Islands 50pp.

[18] UNAIDS 2018, p11

Tuberculosis

Tuberculosis is caused by the bacteria *Myobacterium tuberculosis* which is spread from person to person through the air. Symptoms include a productive cough (sometimes with blood contained in sputum), chest pains, weakness, weight loss, fever and night sweats. Symptoms can develop gradually, making it difficult to diagnose, particularly in children. Treatments are available and it is possible to be cured of tuberculosis through a standard 6-month course of antimicrobial drugs.[19]

In 2019, 66 people in every 100,000 lived with tuberculosis each year. Historically, the incidence rate has ranged between a minimum of 52.63 (2014) and maximum of 106 (2005) during the period 2000 – 2019 (WHO 2020).

In 2017, the Solomon Islands recorded an effective treatment coverage rate of 73.6% for tuberculosis.

Measles

Measles is caused by a highly contagious virus, with initial symptoms including a high fever, runny nose, cough, and red/watery eyes. After a few days (on average, 14 days after exposure to the virus), a rash appears and gradually spreads from face and upper neck to the hands and feet. The virus can cause serious complications and potentially death, particularly in children under 5 years old, or in adults aged over 30. These include blindness, encephalitis (causing brain swelling), ear infections, or pneumonia.

There have been several occasions in the past few years, namely since 2015, where the Solomon Islands have been at high risk of experiencing an outbreak, due to outbreaks elsewhere in the Pacific (such as Samoa). As such, there have been extensive campaigns to vaccinate the population, and particularly young children, against measles.

Across Guadalcanal Province, 96.3% of children aged 12-23 months old received one dose of measles-containing vaccine during 2019. Coverage for the measles vaccine increased during 2019 (compared to previous years) due to a targeted public campaign.

The Solomon Islands Government, Ministry of Health and Medical Services, on January 2020, issued a Travel Advisory that requires travellers arriving in the Solomon Islands to be vaccinated against measles and provide proof of vaccination upon entry.

Influenza-like illness

Various strains of influenza have affected the Solomon Islands population historically. Influenza-like illness is one of the five priority syndromes monitored monthly by the National Surveillance Unit (alongside acute fever and rash, diarrhoea, prolonged fever, and dengue-like illness) (WHO 2015). Both Influenza A and B were circulating in the western Pacific as of October 2020. Cases of Influenza-like illness fluctuated in the range of 200-400 cases in the Solomon Islands throughout 2020, after a peak of just under 500 in the latter months of 2019.[20]

[19] WHO 2020 'Tuberculosis', 14 October 2020, available online at https://www.who.int/news-room/fact-sheets/detail/tuberculosis, accessed 19 November 2020.

[20] WHO 2020 Pacific Island Countries and Areas (PICs) – ILIL Surveillance, PacNet Bulletin, Figure 12, in *Bi-weekly Influenza Situation Update*, p6, 21 October 2020, World Health Organisation, available online at https://www.who.int/docs/default-source/wpro---documents/emergency/surveillance/seasonal-influenza/influenza-20201021.pdf?sfvrsn=39dcc97a_38. Accessed 20 November 2020.

1.3 SUMMARY OF COMMUNITY HEALTH BASELINE SURVEY FINDINGS

The primary data pertaining to community health baseline within the Project area is derived from the outcomes of two separate surveys, being a dedicated Community Health Baseline Survey (CHBS) undertaking during April 2020 and the PO's 2020 social baseline survey. This section presents a summary of key findings from these surveys.

1.3.1 Overview and methodology

A Community Health Baseline Survey (CHBS) was undertaken during April 2020 with the support of HEC and the Project Office to investigate the baseline health status of the local communities and gain some understanding of their immediate health needs. The survey findings were reported in July 2020. Table 2 provides a timeline for the survey and a list of locations visited.

Table 2 Timeframe and spatial extent of survey

Date of Survey	Name of Village	Communities Residing	Number of Households Surveyed
7 April 2020	Vera'ande (Grasshill, Verabisi, Forest)	Bahomea, Malango, Central Guadalcanal	19
7 April 2020	Verakabikabi Village	Bahomea, Malango, Central Guadalcanal Province	21
8 April 2020	Ngongoti Village	Bahomea, Malango, Central Guadalcanal Province	3
8 April 2020	Marava Village	Bahomea, Malango, Central Guadalcanal	11
8 April 2020	Valele Village	Bahomea, Malango, Central Guadalcanal	8
15 April 2020	Managikiki & Verakuji Village	Bahomea, Malango, Central Guadalcanal	29
16 April 2020	Antioch & Valesala Village	Bahomea, Malango, Central Guadalcanal Province	9

The survey included an assessment of the following factors:

- Source and quality of water
- Types of sanitation used by the communities
- Accessibility of healthcare centres in Guadalcanal Province, and in the immediate vicinity of the Project
- Health risk factors
- Identify common/recent illnesses affecting individuals and households
- Identify any existing medical conditions
- Identity any diseases emerging due to poor living conditions

The survey was restricted to communities located within 1km Access Road for the Project; which include traditional land owners of the Tina River (as per the Land Acquisition and Livelihoods Restoration plan, and the Community Benefit Share Project (CSBP), and people over the age of 18.

Interviews were conducted with 99 households across the following villages (number of households in parentheses):

- Antioch (12)
- Managikiki (29)
- Ngongoti (3)
- Marava (11)
- Valele (8)
- Vera'ande (6)
- Verabisi (9)
- Verakambikambi (21)
- Forest area (no formal settlement) (4)

The PO-led social survey was intended to describe the conditions within the Project's area of impact before the start of major construction and benefit sharing activity. It was a mixed methods study which, in addition to a representative random sample survey of 245 households in the Malango cultural area, included key informant interviews, focus group discussions and analysis of existing secondary data. The household survey captured 134 households within the Bahomea cultural area, 86 within the Malango/Belaha and 25 from the settler households, and covered a wide range of topics, including aspects relating to community health.

1.3.2 Access to Health Services

The HEC survey comprised a total sample of 450 people, with the majority averaging between the ages of 16-39 years old. **There are no healthcare centres or clinical operations within the communities surveyed**. As a result, 71% of the households must travel to Honiara, while 29% must travel to Good Samaritan Hospital in Guadalcanal Plains for medical attention. The majority travel to these healthcare centres via public transport if they can afford it. There is no proper treatment for first aid or emergencies available within the communities.

The PO's social survey also looked at access to health services**.** Across the area, it takes an average of 67 minutes for people to get to their nearest nursing station, and 94 minutes to get to a doctor. Those in the Malango district appear to be closest to nursing stations, on average 28 minutes away, while Bahomea residents have the furthest to travel (92 minutes). The Settlers are typically 54 minutes from a nursing station and Belaha residents 42 minutes. Based on the survey responses, the nursing stations most visited are at Verakabikabi in Bahomea, the Good Samaritan Hospital at Nguvia, Chichinge in Malango, and Relocation Village in Belaha.

Malango, Belaha and Settler households must travel about 75 minutes to see a doctor, while the Bahomea residents, who are more remote from Honiara, must travel for about 110 minutes. Based on the survey responses, doctors appear to be available at the Good Samaritan Hospital at Nguvia, and the National Referral Hospital and private clinics in Honiara.

The general lack of access to medical and health services was also listed as one of the main difficulties faced by households. The PO-led household survey noted that over 80% of households reported lack of access to medical services being of high concern, behind only crop damage in frequency. Health services

was also listed as being high on local development preferences for vulnerable households, behind only provision of water supply systems and hygienic latrines (both of which are also community health driven concerns)

1.3.3 Health seeking behaviours

The PO-led survey evaluated health seeking behaviour through questions aimed at determining how households treated illnesses in the family. The majority (66%) noted that they make the journey to the nurse aide post of health clinic, with 30% reporting as treating it themselves using a traditional cure or medicine. Only 11% of respondents noted that they had utilised prayer at some stage, and a smaller number (4%) had sought help from a knowledgeable local person. These statistics indicate in general people will try to seek formal medical treatment where available.

However, communities need to balance this with the financial burden associated with travelling to the medical facilities, paying for treatment, and having family members both support them while away and to ensure the household remains functioning. The April 2020 survey found that cost and travel is always an issue and if there is not sufficient cash, then they cannot travel to the health care centres in Honiara for treatment of more complex conditions. This leads to disease progression and reduced health outcomes.

1.3.4 Water, sanitation, and hygiene practices

Most of the households are using man made springs as their source of water for drinking and cooking, followed by natural springs, streams, and rainwater tanks. Streams and natural springs are often used for showering and washing. A minimal number of households use water tanks, wells, and boreholes as their source of water for drinking, washing and shower. This was clearly demonstrated within the PO-led survey which indicated that more than half of the surveyed households source their drinking water from an unprotected surface source, such as a river (46.57%) or spring (9.80%). In addition to this, 10.78% sourced from unprotected wells. Compounding the issue of drinking water from unprotected sources, is the fact that a large portion of surveyed household (60.42%) do not treat water before consuming it, however the remainder undertake processing through means such as boiling, sand filtration or a commercial filter. 55% of households reported that they purchase bottled water, but only 1% stated that they utilise this as their primary drinking water supply.

The PO-led household survey looks comprehensively at accessibility to sanitation systems. Pit latrines were the most common arrangement, with 50.4% of households having access to a private pit latrine. However, 27.5% of households reported as practicing open defecation, with only 15% of households have access to a modern flush or water sealed toilet. The widespread use of pit latrines without any form of primary or tertiary treatment of effluent, has the potential to further pollute groundwater systems and unprotected water sources.

1.3.5 Nutrition

Nutrition was a focus of the PO social survey, with data on access to nutrition among households gathered using a 24-hour meal recall question. In general, the diet of local households is largely comprised of:

- Carbohydrates in the form of imported rice (eaten at least once in the 24-hour period by 94% of households), root crops such as potatoes, kumara, and cassava (eaten by 65% of households), and bread and cake eaten mainly at breakfast
- Green-leafed vegetables eaten daily by 89% of households.

These are supplemented by a range of vegetables, fruits, and nuts. Only 33% of households in the survey reported as having eaten fish or animal protein in the past 24 hours. The protein comes largely as canned tuna fish, though some reported as having eaten chicken, pork, or shop-bought sausages, mince or corned beef.

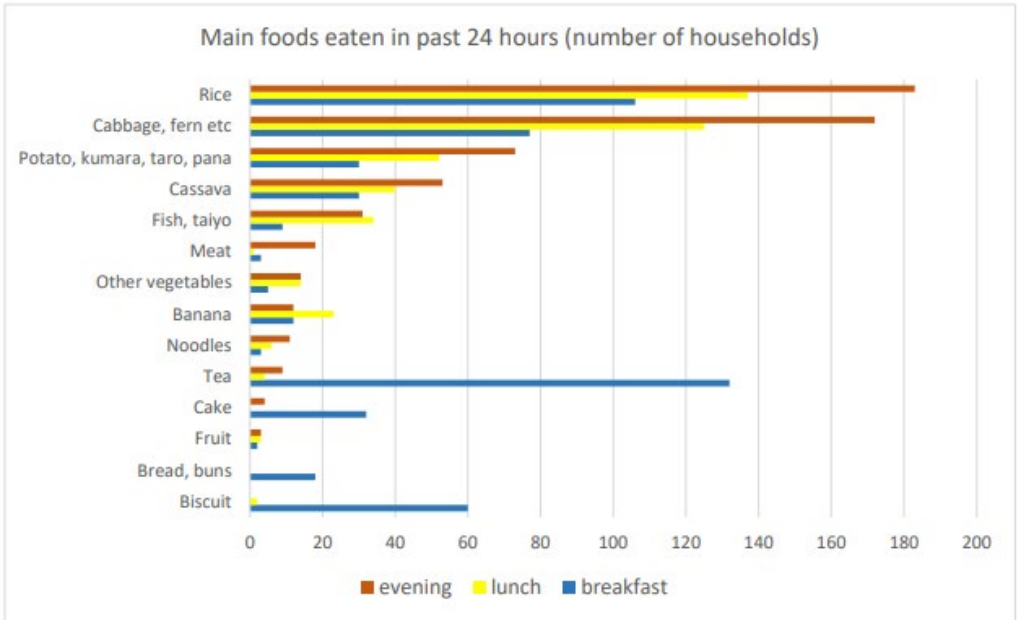


Figure 2 Main Foods Eaten in Past 24 hours (number of households)

1.3.6 Non-communicable health issues

Smoking, chewing betel nut, and alcohol consumption were identified as the main health hazards along with poor rubbish disposal and poor hygiene due to the lack of a safe potable (and accessible) water supply. Poor rubbish disposal (e.g., empty cans, tins along roadsides and around villages) exacerbates the breeding of disease vectors such as mosquitoes and houseflies, which can contribute to increased cases of malaria and diarrhoea.

The April 2020 community health survey investigated in detail common and chronic illnesses, summarised in Figure 3 and Figure 4 respectively.

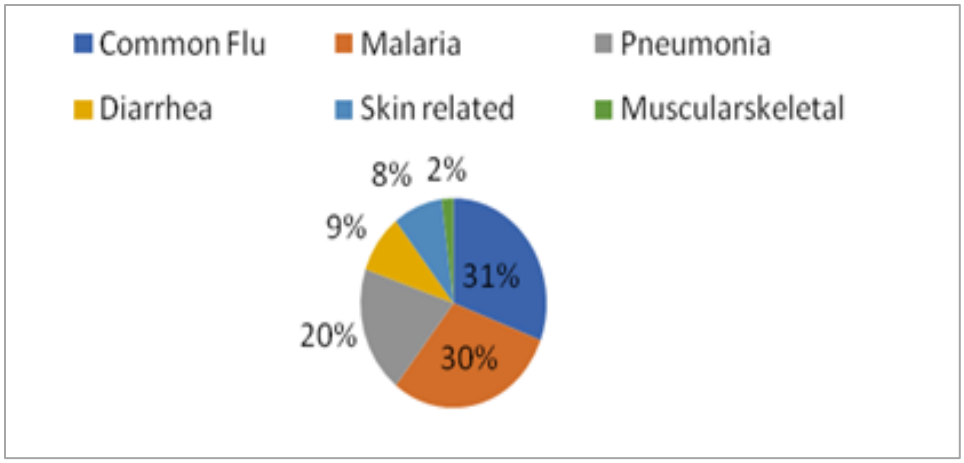


Figure 3 Common illnesses affecting surveyed communities (April 2020)

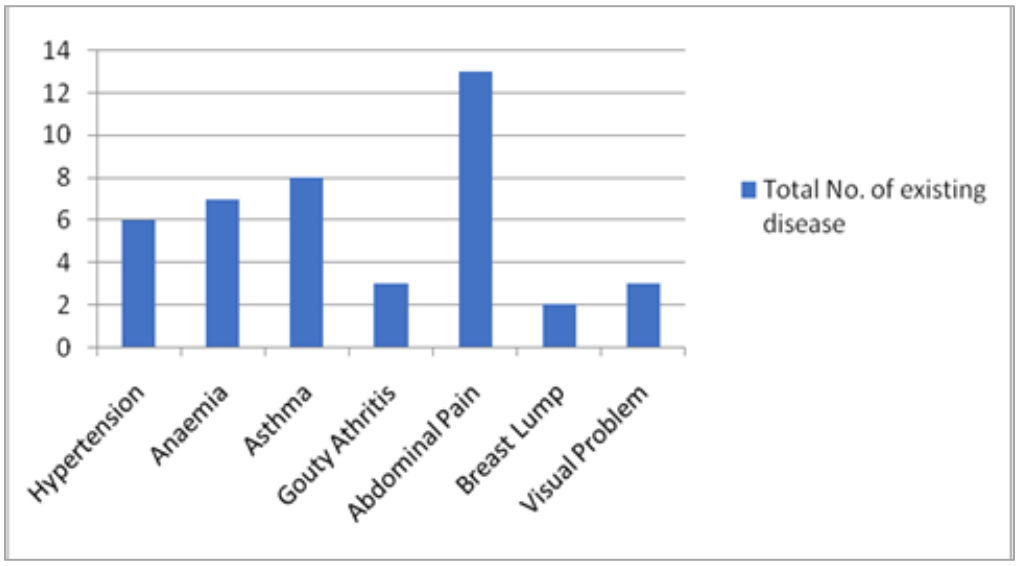


Figure 4 Chronic illnesses affecting surveyed communities (April 2020)

The most common illnesses were found to be common flu, malaria, pneumonia, diarrhoea, skin-related diseases, and muscular pain. The following basic trends have been extrapolated from this data:

- The high prevalence of the reported common flu (31%) and pneumonia (20%) is postulated to be caused by a multitude of factors. This includes poor personal hygiene (due to no taps being available to regulatory wash hands), children being exposed to smokers, smoking rates of 19% within the adult population, communities residing in proximity to dusty roads, and the issues of affordable access to health care meaning that simple cases often develop into pneumonia
- 30% of the surveyed households had experienced episodes of malaria in the previous 12 months. It is unknown whether this is clinically diagnosed malaria, however it appears that there are many opportunities for the primary disease vector (ie mosquitos) to breed in the area

- 9% of the interviewed households reported as having experienced diarrhoea, which is noted in the report to be linked to risk factors associated with the low availability of sanitation facilities and overland flooding leading to primary sources of drinking water being easily contaminated with *E.coli* bacteria. 33 households (14%) report that at least one person in their household was believed to have been sick in the previous week due to the drinking water.
- 8% of the population also reports skin rash, reportedly connected with streams contended to be contaminated by oil. Given the reliance on unprotected water sources, this is likely to present an ongoing health concern.
- 31% of the interviewed households reported as experiencing chronic abdominal pain. The nature of these chronic pains was not established or further evaluated from a clinical perspective. Given the prevalence of unprotected water sources and other illnesses generally linked to poor water quality, these pains may be linked to other water borne illnesses such as giardia.

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No cases of diabetes, malnutrition, mental illness, and childhood diseases like epilepsy, low birth weight, Cerebral Palsy or congenital heart problems were reported in this survey.

The survey concluded that there is a high risk to these communities for non-communicable diseases as 22% of the adult population surveyed were found to be smokers and heavy alcohol consumers. Additionally, this risk factor has been thought to contribute to social problems (detailed below).

1.3.7 Communicable diseases

The survey found that the most prevalent communicable disease was influenza (common flu), and 20% of interviewees had experienced pneumonia in the two months prior to the survey. There is a high prevalence of malaria cases (30% of households has experienced malaria in the preceding two months) and communities have a high risk of dengue outbreaks (also a vector-borne disease) given the availability of potential mosquito breeding grounds.

Other communicable diseases such as Sexually Transmitted Infections (STIs) were not covered within the scope of either survey. This was largely due to the nature of the surveys (open households surveys and focus group discussions) making it an inappropriate setting to attain any information/response regarding STI's. It is recommended that a follow-up survey is undertaken with individuals only (rather than entire households at one time) to gather more information on these more personal conditions, and to determine specific parameters such as Body mass Index (including height and weight); nutritional status; sexual history and practices, and blood pressure. However, it is still to be decided (in consultation with the SIG and Lenders) whether this type of survey is appropriate, and through what mechanism or collaborative setting (eg with a health care NGO) it is best undertaken. This is recognised as being important baseline data given the spread of STI's has been identified as a potential impact both in the ESIA and the Influx Management Plan (IMP).

1.3.8 Disabilities and Long-term Health Problems

Households who are vulnerable and/or contain members with disabilities or long-term chronic health problems can have a higher degree of susceptibility to loss, with any potential loss resulting in a negative impact on wellbeing or livelihood for the person. In the case of community health, these households can be vulnerable due to underlying health conditions (eg disabled family members) or have poor access to

sanitation or drinking water such that minor changes to existing systems can have catastrophic health impacts (eg pollution of drinking water sources)

35% of households had a least one member with a long-term health problem or disability. These are mainly physical disabilities and long-term chronic illness. The overall disability rate (being the percentage of total persons in surveyed households with a reported disability) was 5.9%.

1.3.9 Gender and Vulnerability Aspects

The disaggregation of gender based on vulnerable household categorisation and gender is not complete, primarily due to the surveys being aimed at HH level understanding with the HH head generally answering on behalf of other family members. However, there are some important features that can be gathered from the information at hand:

- The PO-led survey did note that there is little difference in the reported drinking water quality between female HHH and male HHH, with there also being no difference in the reported incidences of water-related sickness.
- Regardless of the above, Female HHHs have a higher reliance on unprotected water sources such as streams and rivers for drinking water, with 57% using these compared with 38% for male HHHs. It can be reasonably linked that female HHHs would be more vulnerable to any changes in water quality.
- Water quality was rated highest by the Malango and Belaha respondents, where 96 and 95% of the respondents described their water as clear. The Bahomea (80%) and Settler (68%) were lower. The Settlers were most likely to have discoloured water especially at Verakabikabi
- The PO-led survey found that there were 67 males and 65 females with a disability or serious illness recorded, being no significant difference across genders

Additional information is required to further understand vulnerabilities and how these are related to exposure to communicable and non-communicable diseases. For example, poorer households may generally live closer to the road networks, which in turn places them at higher risk of exposure to dust.

In order to understand the Project's impacts on different genders throughout the implementation of the Project, evidence-based evaluation of Project's impact on different genders will need to be conducted. This will require the implementation of monitoring regime and indicators. All monitoring should be conducted in a way that gender disaggregate data can be compiled to support the evaluation of Project's impact on different genders.

1.3.10 Social issues

The surveys also provided some insight into social issues experienced in the community, which could also impact on the health and wellbeing of individuals. These included:

- Extra-marital affairs, leading to poor health (from stress) and financial difficulties for women left alone (especially with children)
- Excessive alcohol consumption, contributing to social disturbances/arguments, sexual harassment, unwanted pregnancies and 'disharmony among youth'.
- Poor waste disposal practices, contributing to increased incidence of malaria and dengue fever.

As with the poor availability of medical facilities, the area is exceptionally poorly equipped with facilities and support services to manage alcohol and drug dependency and domestic violence. Summary of Trends

Based on the above information, it is apparent that the communities within the Project area face a number of health challenges that, if not addressed, can be impacted by Project activities. Large proportions of households have at least one member with a long-term health problem or disability. Key trends from the baseline data include:

- While people will tend to seek access to healthcare, the lack of appropriately resourced facilities within the area and the cost of transport required to reach facilities such as those in Honiara, place a high burden on people's limited financial resources. Simple illnesses can quickly progress without health interventions. The lack of health facilities extends to support facilities for dealing with alcohol and drug dependency and domestic violence.
- It is well established that lack of access to protected drinking water sources and use of pit latrines are widespread across the community. This has manifested in waterborne illnesses being common across the community. There is also a high proportion of people reporting undiagnosed chronic stomach pain which may also be linked. Any impacts to water quality will be in the context of any already vulnerable population
- Large proportions of interviewed households reported as having experienced either flu or pneumonia like symptoms in the previous 12 months. This indicates an already high prevalence of respiratory illnesses in the area, which need to be managed to further reduce dust exposure of communities in proximity to access roads in Lot 1, Lot 2 and Lot 3.
- Malaria is widely reported in the area
- There is low levels of protein within peoples diets, with only 33% of interviewed households reporting having eaten any fish or animal protein in the previous 24 hours.

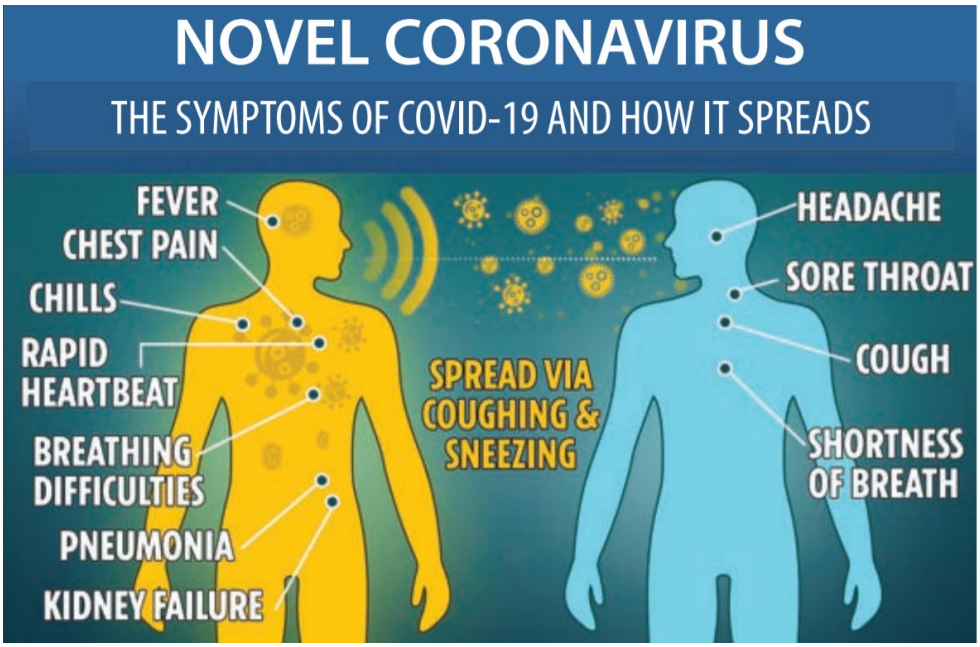
1.4 GLOBAL COVID-19 PANDEMIC

1.4.1 Context

On 30 January 2020, the World Health Organisation declared an outbreak Coronavirus disease (COVID-19) a "public health emergency of international concern". The outbreak was declared a global pandemic on 11 March 2020. As a result, international travel has been severely restricted, and movement within the Solomon Islands is also subject to limitations set by the national government.

COVID-19 is an infectious viral respiratory illness[21] spread via droplets of saliva or discharge from the nose when an infected person coughs or sneezes. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

[21] Information on COVID-19 presented in this section has been sourced from the official World Health Organisation Health Topic online resource available at https://www.who.int/health-topics/coronavirus#tab=tab_1 , current as of 11 September 2020.



Graphic source: MHMS 2020 Coronavirus Fact Sheet

On average, it takes 5–6 days from when someone is infected with the virus for symptoms to show, however it can take up to 14 days.

At the time of writing, there had been 20 reported cases within the Solomon Islands, all imported from overseas (in quarantine), with no community transmission[22]. The last reported case was in March 2021. The vaccination programme in the Solomon Islands has seen a total of 56,621 doses administered to 6 August 2021, which in a population of approximately 670,000 indicates that the vast majority of the population remain unprotected.

The table below provides a guideline to key terminology used in this plan (and related ESMPs) regarding the ongoing COVID-19 pandemic. Definitions have been sourced by various World Health Organisation resources, and pamphlets (e.g. on quarantine procedures) published by MHMS.

Table 3 Definition of terms commonly used in association with the COVID-19 pandemic

Term	Definition
Confirmed COVID-19 case	A person who has positive laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.
Probable COVID-19 case	A person who meets clinical criteria (as for 'suspected' case below) AND is a contact of a probable or confirmed case, or epidemiologically linked to a cluster with at least one confirmed case.
Suspected COVID-19 case	A person who meets the clinical and epidemiological criteria as follows: **Clinical criteria:** Acute onset of fever AND cough;

[22] WHO 2020 Coronavirus Disease (COVID-19) Dashboard, as of 19 November 2020

Term	Definition
	OR Acute onset of ANY THREE OR MORE of the following signs or symptoms: Fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnoea, anorexia/nausea/vomiting, diarrhoeas, altered mental status. **AND Epidemiological Criteria:** Residing or working in an area with high risk of transmission of virus: closed residential settings, humanitarian settings such as camp and camp-like settings for displaced persons; anytime within the 14 days prior to symptom onset; OR • Residing or travel to an area with community transmission anytime within the 14 days prior to symptom onset; OR • Working in any health care setting, including within health facilities or within the community; any time within the 14 days prior of symptom onset. *Note: A patient with severe acute respiratory illness (SARI: acute respiratory infection with history of fever or measured fever of ≥ 38 C°; and cough; with onset within the last 10 days; and requires hospitalization can also be considered a suspected case)*
Community transmission	Where larger outbreaks of local transmission are experienced, defined through an assessment of factors including, but not limited to: • large numbers of cases not linkable to transmission chains • large numbers of cases from sentinel lab • surveillance or increasing positive tests through sentinel samples (routine systematic testing of respiratory samples from established laboratories), multiple unrelated clusters in several areas of the country/territory/area.
Contact	A person who has experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case: 1. face-to-face contact with a probable or confirmed case within 1 metre and for at least 15 minutes 2. direct physical contact with a probable or confirmed case 3. direct care for a patient with probable or confirmed COVID-19 disease without using recommended personal protective equipment OR 4. Other situations as indicated by local risk assessments.
Cluster	Where cases are clustered in time, geographic location and/or by common exposures
Face mask	A medical grade face mask will have the following attributes: • Good breathability • Internal and external faces are clearly identified (e.g. blue on one side, white on other, or shaped to face) • 98% droplet filtration, preferably fluid resistant (this can be achieved by a mask meeting ASTM F2100 Level 1, 2 or 3, EN14683 Type II R, or equivalent standard). **Any personnel undertaking a 'front line' health and safety, security or medical role for this Project shall be given priority for supply of medical grade face masks.**

Term	Definition
	Reusable cloth face coverings can also be effective in reducing the transmission of COVID-19, for the general public (not engaged in one of the roles specified above). However these masks will not be as effective as a medical-grade mask. WHO guidance on the use of homemade face masks in low-resource communities is attached as Annex D, and this advice will be used as part of community-based awareness training.
Hand sanitiser	Alcohol-based liquid hand sanitiser (with between 60-80% alcohol content) in spray, gel or liquid form. Used to cleanse skin when hand washing facilities are not available, and if hands are not visibly soiled.
Lockdown	An emergency protocol that requires citizens, residents or workers within a defined zone to stay at home (or in a designated location/zone) except for essential and emergency purposes. It is a measure employed to restrict the movement of people during emergency conditions. Entry and exit points to any lockdown zone established by SIG will be secured and monitored by the Royal Solomon Islands Police Force (RSIPF). A lockdown may also include curfews, where people must stay in their home or premises during the declared curfew time (e.g. during the night). Curfews can be enforced through the Solomon Islands Emergency Powers (COVID-19) Regulations 2020.
Mandatory quarantine	People who are well but may have been exposed to COVID-19 are kept separate from the rest of the population, to monitor their condition. People in quarantine are restricted from moving outside the facility. If they become sick during quarantine, they will be immediately transferred to an isolation centre.
Isolation	Sick people with the disease are physically separated and cared for separately from those who are not sick. An isolation centre will generally be established as a dedicated ward in a hospital, or some other designated venue.
Physical distancing	Maintaining a distance of at least one metre between people, at all times

1.4.2 Risks to community health

There could be serious adverse outcomes (including high numbers of cases, community transmission, and fatalities attributed to respiratory failure and related complications) if COVID-19 was to spread within the Solomon Islands, given the current status of primary health care in the country. Several factors would hinder the speed and efficacy of any public health response to an outbreak of COVID-19, including:

- There are very low vaccination rates in the Solomon Islands, with only 56,621 doses of vaccine being administered to date, from a total population of 670,000. The entire population therefore remains at high—risk of being infected and overwhelming the public health system
- Poor access to safe and reliable drinking water supply, and water for sanitation, especially in informal urban settlements and rural communities,
- Households are typically large and multi-generational; accommodation is often over-crowded and does not allow for adequate physical distancing between occupants.

- The public health system is already under-resourced, particularly with a lack of operational rural health clinics in the Grove area. This means that in the event of an outbreak, which is likely to be concentrated in Honiara (due to it being the major port of entry for Solomon Islands, and having a higher population density than outlying areas), it is likely to be difficult for the public to get assistance in the Grove area.

The following risks have been identified in relation to COVID-19, the impacts of a potential outbreak on the Project, and risks generated by a combination of Project activities and a COVID-19 outbreak to the community:

- The Project Office, THL and HEC all have corporate offices in Honiara, where the majority of the workforce will be based. After the start of construction, the project workers shall shift to the Project Office site.. Honiara is the most densely populated municipality in the Solomon Islands.
- While the majority of workers required for the Project are being sourced from the Solomon Islands, there is a proportion of the workforce (namely in skilled/managerial roles) which are being sourced from other countries such as the Republic of Korea, India, Pakistan, Fiji, Srilanka, Philippines and Australia. All of these countries have had active COVID-19 cases (including community transmission as of August 2020.
- The Project Direct Impact Area and workers' camp are located close to a major access route (Black Post Road) connecting many villages from the upper Tina River catchment through to the Kukum Highway and Honiara.
- Up to 214 workers will be accommodated in the workers' camp at any one time during construction. The risk of a COVID-19 outbreak in the camp is higher if appropriate mitigation measures (such as those outlined in the HRLMP) are not proactively and effectively implemented.
- The risk of any COVID-19 outbreak spreading is also higher when locally-employed workers are living in their own homes, in the local communities. This is especially relevant for this Project, where the recruitment hierarchy gives first priority to Guale people living in Project-affected communities. Local workers will be interacting with staff from overseas.
- Access to health services is poor in Project-affected communities. This means that people may also experience difficulties in obtaining information from health authorities about the risks of COVID-19, preventative measures and related responses. They may also be vulnerable to misinformation disseminated through informal channels (word of mouth, social media).
- Respiratory conditions are known to exist in the local community (as per Section 2.2.5); as such there could be a number of people at high risk of developing severe respiratory infections if they contract COVID-19, requiring hospitalisation and intensive care. This would place a further burden on an already under-resourced health system, and could lead to elevated mortality rates.

1.4.3 National and Project-specific COVID-19 response

A Project-specific risk assessment and policy for the management of any COVID-19 related risks to (and from) the Project, and related response, has been developed by the Project Office and THL (Annex C). This policy incorporates the requirements of SIG (including those from the Consolidated National Preparedness and Response Plan for COVID-19, issued 12 March 2020). Similarly, HEC have also developed a specific protocol targeted at managing the workforce and Project assets and operations both in terms of preparedness, and in the event of an outbreak during construction. The approach

outlined in both documents is summarised here, but the original documentation and a full impact assessment is appended in Annex C for reference. This Covid-19 plan has been reviewed and approved by the Lenders and has been approved for implementation

Implementation of the Project-specific COVID-19 management policy is primarily the responsibility of the Project Office's Deputy Project Manager, who will be assisted and supported by other SIG agencies, SIEA, the PO E&S Safeguards Manager, THL and HEC as required.

National or provincial measures (implemented via direction from SIG):

- Mandatory quarantine of all travellers (including Solomon Island nationals and foreign nationals) on entry to the country, in a government-approved facility
- COVID-19 testing program to screen in-migrants, and to investigate any suspected cases of COVID-19
- Lockdown drills in Honiara (the first of which was held between 20-22 May 2020) to test the city's response in the event a lockdown is required to contain the population prevent or slow down the rate of community transmission

Measures specific to the Project and/or Project-affected communities (implemented by THL and HEC, with support from PO where necessary):

- A TRHDP COVID-19 Working Group will be established, with representatives from the PO, other SIG agencies, SIEA, THL and HEC to share information, develop procedures, and coordinate preventative actions, mitigation and monitoring activities. The remit of this group is further outlined in Annex C.
- Deliver training to workers and in communities to raise awareness about the symptoms and risks of COVID-19, preventative measures, and emergency response protocols in the event of an outbreak.
- Promote good hygiene practices in the workplace, the camp, and in communities/at home such as hand washing (with clean / boiled and cooled water and soap, for at least 20 seconds), regular cleaning and disinfection of surfaces, use of hand sanitisers, and coughing or sneezing into elbows, and avoiding touching eyes, nose and mouth.
- Assist SIG in educating the community on the symptoms of COVID-19 (in a manner consistent with public health messaging), including how to decide whether or not to go to work/school/leave home, or stay home and seek help.
- Stockpile Personal Protective Equipment (PPE) (e.g. N95 rated face masks and surgical face masks; disposable gloves and coveralls; face shields; hand sanitiser; rapid COVID-19 testing kits) to supply the Project workforce for at least one month
- Prepare and communicate a plan to seek additional health assistance, and establish communication hierarchies to keep people informed in the event of an outbreak. This could potentially be developed further for communities via the Community Benefit Share Project (CBSP), including gaining access to PPE and cleaning supplies, clean water etc. Opportunities to use Project networks to assist communities with the COVID-19 response will be discussed and evaluated by the TRHDP COVID-19 Working Group (described further in Annex C).
- Set aside temporary facilities to house workers who contract the virus, so that they can be isolated from the rest of the workforce and community populations.

- Restrict access to and from the Project DIA and workers' camp, through security measures such as barrier gates at the entrance to the DIA, security patrols around active work areas, and limiting visitor access to the camp and work site (with strict records kept to allow for rapid contact tracing where required).
- Prepare a plan to lockdown the Project DIA and workers' camp in the event of an outbreak in nearby communities, or in the Project workforce.
- Provide ways for workers to continue working remotely from off-site, in the event of a Project or local/regional lockdown. This would only apply to office-based workers or skilled workers who are able to carry out their duties (such as administrative tasks) remotely, rather than on site.
- Establish a contingency plan for unskilled workers/construction labourers who could be unable to work on site in the event of a lockdown. This includes setting expectations for continued remuneration/financial support, or options for retrenchment (and the conditions under which this would be necessary), and a plan to communicate messages relating to employment to the workforce when they are located remotely from the site (e.g. at home).
- Scheduling work shifts and meetings to a) minimise the number of people gathering at any one time (and to maximise the chances of successful physical distancing) and b) to build in a contingency of 'back up' shifts to keep the Project operational in the event that multiple workers contract COVID-19 at once.
- Consistent with the requirements of the SIG, all foreign workers (including contractors, sub-contractors and consultants) are required to have been through the full COVID-19 vaccination course prior to leaving their home country. This includes any period after the second vaccination required for it to be fully effective and vaccination considered complete. All workers are encouraged to get vaccinated. Workers will be entitled for paid time off for break from work to get vaccination as well as rest after dose.

1.4.4 Identified health services

The following locations have been identified as approved quarantine facilities, managed by SIG:

- National Referral Hospital Isolation Unit is being used for positive cases.
- King Solomon Hotel, Point Cruz
- Heritage Park Hotel, Mendana Avenue
- Pacific Casino Hotel, Kukum Highway
- Guadalcanal Beach Resort, Henderson
- Vimo Apartment, Henderson
- Access Unit, Henderson
- Airport Motel, Henderson
- Chengs, Henderson

COVID-19 testing is also being done at these facilities during the quarantine tenure. Further testing of outgoing passengers is conducted at National Referral Hospital before departure.

This information was current as of November 2020 but is subject to change as the situation develops.

1.4.5 Mobilisation, quarantine and testing protocols

It is anticipated that quarantine and testing requirements may change as the pandemic evolves. The following protocols have been established by SIG, and HEC has agreed the approach with SIG in relation

to screening, testing, quarantine and/or isolation of Project workers. These testing arrangements changes from time to time depending upon the enforcement of travel advisories and risk evaluation by the Oversight Committee (OSC) of Solomon Island Government.

Prior to mobilisation of HEC employees (from overseas to Solomon Islands)

The HEC Administration Team (led by HR and Administration Managers) shall ensure that every practical effort has been made to provide for the following:

- That personnel are healthy and ready for work before being brought in to Solomon Islands. As of now, The Solomon Island Government has stated conditions of being tested with Rapid Testing (RT) Polymerase Chain Reaction (PCR) test prior to entering. For High risk countries[23], three negative RT PCR tests needs to be endorsed (first-18 to 21days, second-8 to 11days third-72 hours prior to departure), while low risk countries require two(second and third only)
- All necessary housing and transportation have been arranged. Since the personnel being brought in are to be in paid Quarantine centres, arrangements have to be made with the Hotel and the authorities for accommodation. The Booking information is provided to the OSC as a part of pre departure information.
- Availability of food service to the personnel in quarantine is ensured in communication with the Quarantine Centre/Hotel. Further, delivery of water, dry food for emergency use and other essentials like sim card, toiletries, sanitizers are delivered to the Quarantine Centre and kept at the respective rooms prior to their arrival.
- For the regular food materials, HEC has secured 6 months' worth of food supplies through cargo ship, imported from Korea. The canteen will be operated only for non-local workers. The Administration Team can organised for packed meals to be made available to local workers from the canteen if required.
- Further, HEC is procuring vegetables and perishable foods from Korean restaurants/Food supplier in Honiara, and they get their supplies from a number of local suppliers and open market. They can meet HEC's requirements for food materials in terms of quantity and availability. The suppliers have been well informed about this kind of scenario which may arise.
- Acquisition of all required PPE, First-Aid response kits and consumables

Quarantine of workers arriving in the Solomon Islands from overseas

- The HEC HSE Manager shall maintain contact with Guadalcanal Province - Health Promotion team and the MHMS Emergency Health and Surveillance Unit regarding the rapidly changing COVID-19 protocols and COVID-19 testing arrangements and locations.
- Prior approval will be sought from the Prime Minister's Office for entry of foreign employees into the Solomon Islands through scheduled repatriation flights. A list of approved travellers will be published in the Official Gazzette, after which a ticket can be booked on a scheduled flight.
- It is mandatory for people arriving into the country to be quarantined at the government approved Quarantine facility for between 14 to 24 days depending on the risk category of Countries from which the passenger travelled or transited

[23] The high risk and low risk countries are changed from time to time, the list is governed by Travel Advisories enacted by the Solomon Islands Government. The risk level is set by the SI government Ministry of Health and is reviewed on a fortnightly basis.

- People quarantined in an approved facility will be tested by MHMS according to the 'Quarantine period and testing requirements' as per Part 3 Section 20-23 of Emergency Powers(COVID-19)(No 3) (Amendment No 2) Regulation 2020. Currently the usual approach for personnel travelling from high risk countries is to quarantine for 3 weeks, with testing conducted as follows:
    - Test No 1upon entry into a quarantine facility
    - Test No 2: after 1 week from start of quarantine period
    - Test No 3: after 2 weeks from start of quarantine period
    - Test No 4: 2 ~ 3 days before end of quarantine period

Screening before starting work (after quarantine is complete)

- After the quarantine period, and prior to being deployed to remote job sites, personnel shall be screened for any current symptoms (i.e. fever, dry cough, difficulty in breathing, and/or fatigue) and body temperature (shall be less than 37.5°C).
- Personnel who do not pass the screening criteria shall not be allowed to mobilize to the Project work site and shall remain in isolation at an accommodation secured by HEC, located near Henderson airport. This accommodation facility can house three people at any one time, until they are clear from any symptoms, and have tested negative and have been deemed safe to return to work by a medical professional (e.g. the Project Doctor, Dr. Pedical).
- When the workers' camp is occupied and seeing an increased occupancy after the start of construction, a dedicated building within the workers' camp (likely the HEC Local House, which will not be occupied until peak dam construction) can be used for isolation of suspected cases within the camp.
- Dr. Pedical can be called on for consultation and support during isolation; if further assistance is required, it shall be sought from the National Referral Hospital. Until the health clinic is established on-site at the temporary office, Project employees will be sent to Dr Pedical's existing practice clinic located at Capital Park, Honiara for regular health check-up and consultations (whenever required). This is in the same building as HEC's office (pre-construction).

Ongoing monitoring of the workforce

- Site Supervisors shall remain diligent in ensuring that personnel are healthy and fit for work and shall remove, quarantine and report any employee who exhibits the above symptoms.
- Two thermal imaging cameras have been installed at the HEC office (Honiara, and eventually the temporary site office) which monitor body temperature automatically. Every morning all the employees are scanned for temperature using a contactless Infra-red thermometer prior to entering into the office.

Protocols for everyone in the Solomon Islands (including general public):

People who have travelled to an area where COVID-19 has been reported (e.g. if community transmission begins to occur in the Solomon Islands); or who have been in close contact with someone who has travelled to any affected location or had symptoms of COVID-19 are instructed to **phone the Public Health Emergency Surveillance Unit on 23650 or 7522202**, avoid using public transport, and maintain physical distance of at least 1 m from other people at all times.

1.5 *Interaction between the Project and Public Health Services*

Throughout the socio-economic baseline survey conducted at the end of October to early November 2021, baseline health conditions, healthcare services and its access have been collected to support the impact assessment and development of Socio-economic Monitoring Framework. Various key informants were consulted including healthcare workers in order to identify community's current socio-economic status and priority needs, which include healthcare systems.

HEC had joined several meetings and workshops to build linkages with the stakeholders covering a wide range of subjects like Malaria prevention, COVID-19 and to discuss about issues related to emergency communications during an outbreak. It is noted that HEC is not only focusing on workers health but also on the community health aspects. HEC engaged with MHMS in August and September 2020 to gain an understanding of the current information available about the health of the local population affected by the Project, and available health services. As a result, two agreements between HEC/THL/PO with MHMS have been made, namely:

- COVID-19 Protocol for Workplace; and
- Vector Surveillance.

The COVID-19 Protocol provides a detailed procedure for preparation against COVID-19, which will require the Project to collaborate with all stakeholders as well as public health partners to respond to the situation. It also has information on Community Awareness Programme conducted by the Guadalcanal Provincial Health Emergency Operations Centre (HPHEOC).

The Vector Surveillance Agreement has been signed between HEC/THL/PO with MHMS, particularly the Vector Surveillance divisions of Centre and Guadalcanal Province. Information exchange throughout the discussion process with MHMS includes:

- The various vector surveillance arrangement in place;
- The monitoring measures that are being carried out at various levels;
- The control measures, frequency and its effectiveness.

The agreement also sets out the Project participation on Vector Surveillance, Monitoring and Control in various aspects such as:

- Awareness to communities and workers;
- Monitoring of diseases of workers;
- Monitoring of community health;
- Control measures for Malaria and vector borne diseases in workers camp;
- Control measures for communities;
- Community health infrastructure development programme.

Both the agreements include detailed emergency contact information of various potential involving stakeholders including:

- Ministry of Health and Medical Services;
- HEC;
- PO; and
- THL.

Much of the information gleaned through these discussions has been incorporated into the CHVDMP. It has been agreed that HEC will maintain regular communications with MHMS, predominantly with Dr Churchill Pedical and his nursing staff acting as an intermediary.

A similar relationship will be maintained with St John Ambulance Service (for the provision of paramedic care and transport services in the event of multiple casualties/catastrophic incident amongst the Project workforce or affected communities) . HEC will operate its own ambulance from the health clinic at the office site, which will be on stand by for emergencies involving only one or two patients.

HEC and THL (with occasional support by Project Office, namely to utilise existing networks within SIG) will also liaise with the following agencies from time to time, for various activities such as to develop community awareness training programmes (as described in the IMP, HRLMP and WHSP):

- Solomon Islands Red Cross (first aid training and emergency response advice)
- Solomon Islands Planned Parenthood Association (advising on sexual health and contraceptive use education/preventative actions; hygiene behaviour)
- Seif Ples (gender-based violence crisis and referral centre in Honiara, supported by the Royal Solomon Islands Police Force)
- Ministry for Women, Youth, Children and Family Affairs (training, awareness and support programs targeted to women and young people in Project-affected communities, and women in the workforce)
- Guadalcanal Provincial Health Department: Malaria Department (malaria-related controls and information) and Field Officers (general community health support and advice to inform the practical and appropriate implementation of the controls detailed in this CHDVMP)
- National Vector Surveillance Unit (preventative measures and communicable disease incidence monitoring)

ANNEX P-10-III VECTOR SURVEILLANCE AND COMMUNITY HEALTH SERVICES (AGREEMETNS WITH MHMS)

Vector Surveillance

In a meeting with MHMS and members of Tina River Hydropower Project on 12th of August, 2020, the project requested for the support from MHMS and Guadalcanal Province with respect issues like: Emergency Communication Protocols in the event of Outbreaks and accidents, Vector Surveillance, Community Awareness and Existing Health Infrastructure and its development. The information derived shall be used for drafting and implementation of P10 Community Health and Disease Vector Management Plan.

Hyundai Engineering Company with the support from Ministry of Health and Medical services conducted discussions with Vector Surveillance divisions of Centre and Guadalcanal Province to get information on:

a. the various vector surveillance arrangements in place.
b. The monitoring measures that are being carried on at various levels.
c. The control measures, frequency and its effectiveness.

Provisions for Vector Surveillance by MHMS and Guadalcanal Province:

On the discussion with Malaria Department of Guadalcanal Province and National Vector Surveillance unit the following information were derived:

1. The vector surveillance is focused on Malaria and Dengue due to its high prevalence in the country. Zika virus case was detected in 2015. Subsequently some studies were done by the James Cook University, However the results are unavailable with the organizations.
2. Event based Vector surveillance is more common compared to the Regular Vector surveillance.
3. **Event based vector surveillance** are conducted in the case of an outbreak by National Surveillance Unit. Some of the events on which vector Surveillance were conducted are: Malaria outbreak post flood on 2014, Dengue Outbreak 2016 and Zika in 2015.
4. The National Surveillance Unit is responsible for surveillance of Malaria and Dengue in Solomon Islands. There are six sentinel sites in the country for regular surveillance and one of them is in Zone 6[1]. They carry on Insecticide resistance checks at these sites too.
5. The NSU conducts Larva studies, and uses Grab trap methods for Dengue and Light and Ovitrap methods for Malaria.
6. **Monitoring:** The data for clinical information is shared by the Clinics and field staffs using Software, DHIS 2.0 which is also used by the Guadalcanal Malaria

[1] Zone 6: The Guadalcanal Province is divided into 6 malaria zones. The project lies in the zone 6 which extends from Lungga to Tertare, being the largest in terms of area.

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Department. The NSU uses Malaria Case Management Register (Software, MCMR) to identify:

a. The malaria cases and its type.
b. Location
c. Diagnosis Methods.

7. The **control measures effectiveness** is also carried out by NSU:
   a. Insectary were established earlier to carry on study of species, insecticide effectiveness but now they are not available.
   b. Use bio efficacy to determine the effect of mosquito bet nets. The findings were some of the brands satisfy the period up to 3 years but some fail.
   c. The Indoor Residual Spraying with Detamethrin is usually administered at a frequency of 6 months and it is effective. However, after the IRS was stopped, there was an increasing trend in the number of cases. It is expected to start again in the next year after procurement of insecticides from abroad (Australia).
8. The **Control Measures** are generally implemented by the Guadalcanal Province Malaria department.
   a. Bed nets with chemical treatment(deltamethrin) is provided every three years. The next expected distribution is in 2021as three years is getting completed. The rate of distribution is about one mosquito net per person.
   b. Indoor Residual spraying is administered on a bi annual basis but it has been seized since 2015 due to lack of insectides. It was also used during the outbreaks.
   c. Outdoor Spraying is done for dengue in every week for three weeks in row and then checked for the effectiveness. Usually conducted during outbreaks.
9. Some of the studies have been conducted on Zone 6 that shows Behavioral response have developed towards malaria. The area concerning to the high altitudes have low prevalence and are concentrated around the coastal areas. The reports shall be shared for more information. The Malaria Parasite Transmission Suitability Map for Guadalcanal also shows similar kind of information.
10. The NSU further stated that the Public health services Unit of MHMS carries out Surveillance focused on Dengue. They monitor the cases based on:
    a. Dengue like illness
    b. Flu or influenza like illness
    c. Syndromic data

    The reports are shared and communicated between the organizations within MHMS on a weekly basis.

Vector Surveillance

Project participation on Vector Surveillance, Monitoring and Control:

1. **Awareness to Communities and Workers:**
   The EPC Contractor shall arrange to provide Awareness to its Workers and Community Members on Malaria and Vector Borne Diseases. In this context the Guadalcanal Province Malaria Department was identified and communicated earlier and was confirmed. HEC also sought for the guidance of National Surveillance Unit to provide Awareness training. The training is intended at a frequency of every six months during the Project Construction period.

2. **Monitoring of Diseases of Workers:**
   The Staff nurse appointed for the Health Clinic at Project Office Site shall keep a record of the diseases among workers. It shall be useful in keeping a record of disease prevalence and the effectiveness of the Health measures in place.

   After the construction of health facility is completed at the office site, Inspections shall be conducted by MHMS, Infrastructure Division and shall be enrolled into MHMS system. Information on treatment and health facility utilization shall be provided by HEC Staff Nurse to MHMS as per the protocol that shall be established.

3. **Monitoring of Community Health:**
   a. The health team formulated by the EPC Contractor (a doctor, Pedical and his nurses) shall visit the communities every six months to have an analysis on the Community Health, Disease prevalence and comparison against baseline.
   b. The EPC contractor has requested the GP Malaria Department and National Surveillance Unit to provide the data for Zone 6 (refined to Project Communities), so that they can be analyzed for the trends in disease and discuss with the stakeholders in the implementation of measures to reduce the diseases.
      The control measures can be implemented by the Project Stakeholders with the help of Field Officers of Guadalcanal Provincial Health Department.

4. **Control Measures for Malaria and Vector Borne diseases in Workers Camp.**
   The workers camp shall be regularly inspected for active breeding grounds by Environment and Social Team. Emphasis shall be given on Physical and Mechanical methods keeping pests out such as:
   a. Pest proofing the Control Points: Use of Mosquito screens on the window.
   b. Controlling the mosquito breeding sites (ditches of stagnant water).
   c. Use of Insect repellant sprays inside the rooms.

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5. **Control Measures for Communities:**
   The Project shall work together the Communities and the Guadalcanal Malaria team in conducting various control measures like:
   a. Awareness program shall inform communities of the Cultural Control measures which involves manipulation of environment such as food, water and shelter to make it less favorable for the pest to exist. Environment shall be kept clean so as not to attract the pests.
      - Tip and Toss
      - Cleaning rain gutters.
      - Cut shrubs to reduce vesting sites
      - Declutter yards.
      - Check for water sources to keep it clean and maintain hygiene.
   b. Assist the GP Malaria team with provisions to carry out Indoor Residual Spraying and Ultra Low Volume Fogging. Equipment, Allowances and logistic support can be provided to the team to conduct the control measures in the project communities/villages as per recommended frequency.
   HEC has discussed with GP Malaria department in this regard. The only thing that is hindering now is the availability of chemicals. Upon the availability of Chemicals to GP Malaria team, a clear plan can be put into place for implementation. HEC will develop this and provide regular Indoor Residual Spraying (twice a year) and Ultra Low Volume Outdoor Fogging (twice a month) for workers.

6. **Community Health Infrastructure Development:**

During the Community Health Baseline Survey by HEC and further surveys by the Community Liaison Officer of TRHDP PO. It was found that the two Health clinics for the people and communities around the project area are not operating from at least 6 months of time. They are Konga and Namanu.

HEC had requested the TRHDP PO and MHMS to look forward in reopening the existing health facilities for the communities. These facilities will help the communities by providing basic health amenities and reduce the impact.

Prepared by: HEC		Checked by: THL		Acknowledged by: TRHDP PO		Approved by: MHMS	

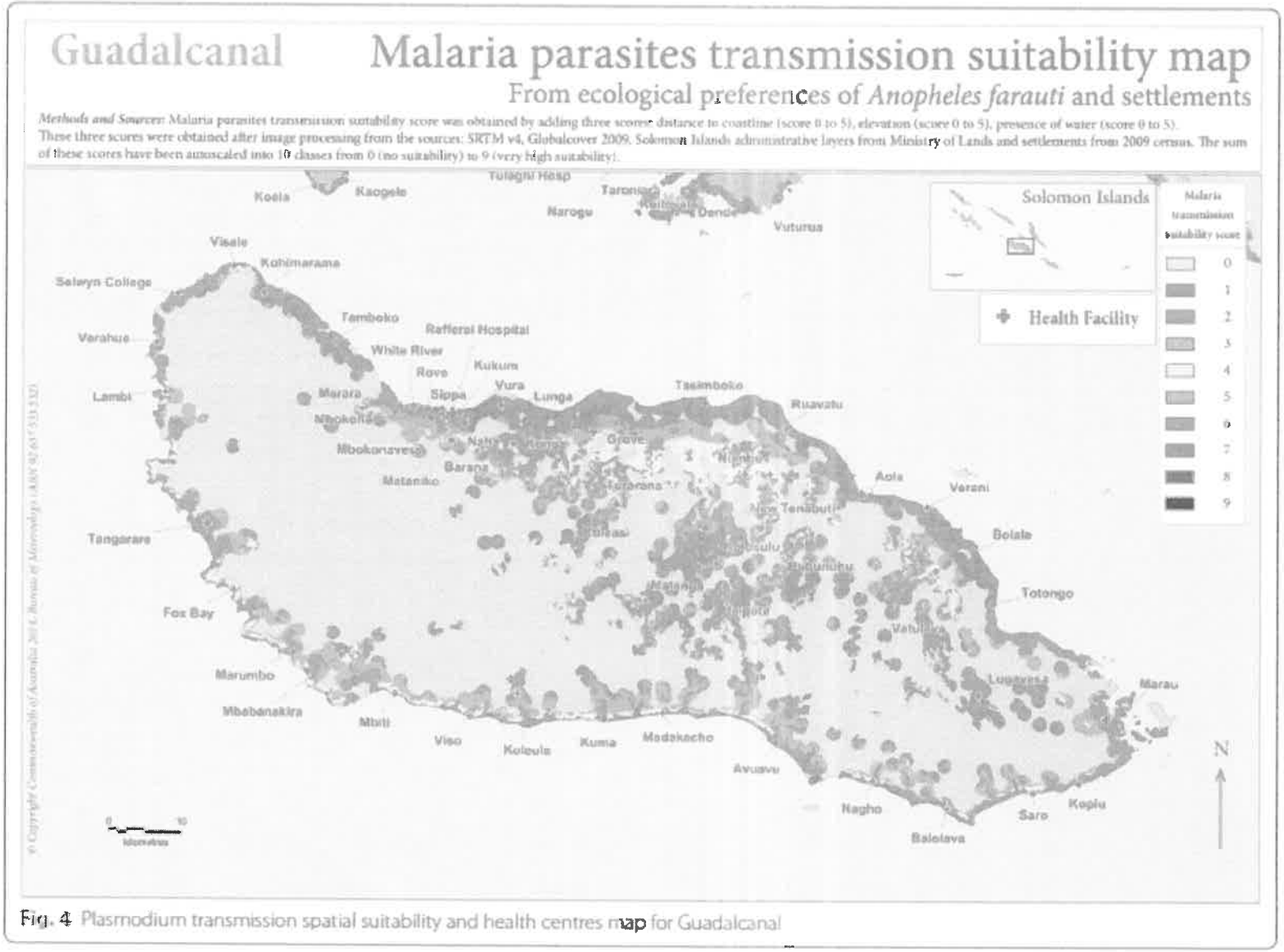


Fig. 4 Plasmodium transmission spatial suitability and health centres map for Guadalcanal

Emergency Communication Protocols with MHMS

A meeting was held between MHMS, TRHDP PO, THL and HEC at the MHMS Headquarters, Honiara on 8th July 2020 to discuss on the emergency protocols, subsequent follow ups were done by HEC to get the required information from MHMS. The emergency protocols have been updated with inputs from MHMS including the contact information.

The Ministry of Health and Medical Services is a central body looking after the whole country. The Project lies in the Guadalcanal Province; the Guadalcanal Provincial Health division can also be reached during the Emergency.

Emergency Communication Protocol during Disease Outbreak:

In the event of an emergency disease outbreak in and around Project area, the Project Manager, Mr. Moon of HEC can declare a state of emergency.

The HSE Manager responsible for the P10 Community Health, Disease and Vector Management plan shall communicate with Health and Emergency Surveillance Department of Ministry of Health and Medical Services, Solomon Islands. The person to be contacted is Manager or Acting Manager (Surveillance Officer), HES, MHMS.

On the request of the Project, the responsible staff from the Health and Emergency Surveillance Division shall visit the affected area to take required action. The authority can activate the phase if there is high likelihood that cases or event may spread rapidly or cause significant harm (including health consequences of disaster or other emergency).

The Health and Emergency Surveillance Division at MHMS conducts Indicator based Surveillance(IBS) and Event Based Surveillance(EBS)on a regular basis. The data is obtained from clinical staff, laboratories and other sectors (e.g. - animal health). The surveillance information is usually brought together and assessed for any public health risks, both on a regular basis and if there is any suspected events or cases that may concern. The risk assessment is conducted differently for different kind of scenarios with expertise within MHMS or with the help of WHO.

Emergency contacts during Disease Outbreak:			
Name	**Designation**	**Tel/Mobile No.**	**Email**
Cynthia Joshua	Surveillance Officer (MHMS)	+677-23650/7753723	cjoshua@moh.gov.sb
Alison Sio	Surveillance Officer MHMS	+677-23650/7522177	asio@moh.gov.sb
Alfred Maedaudau	Surveillance Officer, Guadalcanal Provincial Health	+677-21478	

Prepared by: HEC		Checked by: THL		Acknowledged by: TRHDP PO		Approved by: MHMS	

Emergency Communication Protocols with MHMS

Emergency Communication Protocol during Accident or any other emergency:

During the act of an emergency that involves Project Workers or communities or both, it is first essential to rescue and administer first aid, in the meantime ambulance can be called in and extensive medical services can be provided.

The Project has an ambulance operated by HEC. It shall be in standby condition at the Health Clinic at the office Site in Project Area. If due to any conditions the ambulance is not available, the affected can be taken is the available project vehicle nearby. The National Referral Hospital uses St John Ambulance for emergency rescue and transportation. The Project can seek St John Ambulance to come in if the extent is large.

At HEC, the field Supervisors are trained with First Aid administering by Solomon Island Red Cross. In case of an emergency they can be called in.

The nurse stationed at the Health Clinic at the office Site in Project Area shall also be called in during an emergency to provide first aid and basic medical services until the patient reaches the Hospital.

In the event of emergency, the accident shall be report to the Health and Safety supervisors or HSE Manager or Office site health Clinic for assistance. On the information receipt, Ambulance shall be immediately dispatched to the accident site with the staff nurse.

The HSE Manager shall communicate with designated MHMS authorities stated below to act during emergency situation requiring assistance.

Emergency Contacts during Accidents			
Name	**Designation**	**Tel/Mobile No.**	**Email**
Dr. John Hue	Medical Superintendent, National Referral Hospital	+677-44000/44121	
Dr. Joel Denty	Provincial Health Director, Guadalcanal Province	+677-21478	

About MHMS

At the national level, International Health Regulations and health emergency coordination is led by National IHR Focal Point. This responsibility lies with Health Emergency and Surveillance Unit in MHMS.

A designated Health Emergency Coordinator is available in each province. In Solomon Islands there are three main levels of emergency arrangements and response

a. Local (provincial level and below)
b. National

Emergency Communication Protocols with MHMS

c. Highest Level national which involves government and later involves multiple sectors.

Responsibilities of various agencies in the government depends on the type of hazard.

Organization in Lead Role	Type of Emergency
Ministry of Health and Medical Services	Outbreak, epidemic, Pandemic or a mass causality like trauma and burns
Ministry of Agriculture and Livestock	In the event of agricultural
National Disaster Management Office	All other events of emergency

Other Contact Information:

#	Name	Designation	Organization	Contact Information	Remarks
Ministry of Health and Medical Services					
1	National Referral Hospital		MHMS	+677-25256/44000	
2	Ambulance Service		MHMS/St John	911	
3	Mr. Albino Bobogare	Director	National Vector Borne Disease and Control Program	+677-7779131	
4	Dr. Jackson Rakei	Officer	HIV, AIDS and STI	+677-28210	
5	Mrs. Nevalyn Laesango	Officer	Non Communicable Diseases	+677-28199	
6	Muffet Taro	Officer	Nutrition Department	+677-21202	
Hyundai Engineering Company					
1	Chung Ryul Ha	Site Manager	Hyundai Engineering Company	+677-7279982	
2	Euiman Moon	Project Manager		+677-7584604	
3	Daeyong Kim	HSE Manager		+677-7411755	
4	Patrick Kkekete	Training Supervisor		+677-7791692	First Aid Trained
5	Jonathon Nonosala	H and S Supervisor		+677-7382076	First Aid Trained

Prepared by: HEC		Checked by: THL		Acknowledged by: TRHDP PO		Approved by: MHMS	

Emergency Communication Protocols with MHMS

6	Doghlous Rebasi	H and S Staff		+677-7182805	
7	Trevor Hardfield	H and S Staff		+677-7665131	
8	Ernest Kolly	E and S Supervisor		+677-7588103	First Aid Trained
9	Edmond Jr Bate	E and S Staff		+677-8477481	
Project Office					
1	Fred Conning	Deputy Project Manager	TRHDP PO, MMERE	+677-~~7119096~~ 7496338	
Tina Hydropower Limited					
1	Jaeil Ryoo	CEO	THL	+677-7975259	
2	Jihun Lee	CFO		+677-7653985	

Prepared by: HEC		Checked by: THL		Acknowledged by: TRHDP PO		Approved by: MHMS	

Tina River Hydropower Development Project: Action Plan with Ministry of Health and Medical Services and stakeholders

Emergency Communication Protocol					
Sl No	**Event**	**Name of the Organization**	**Contact Person**	**Contact Number**	**Remarks**
1	Disease Outbreak	MHMS, Surveillance Officer	Cynthia Joshua	+677-7753723	
		MHMS, Surveillance Officer	Alison Sio	+677-7522177	
		Guadalcanal Provincial Health, Surveillance Officer	Alfred Maedaudau	+677-21478	
2	Accident or any other emergency	National Referral Hospital, Medical Superintendent	Dr John Hue	+677-44000	
		Guadalcanal Province , Provincial Health Director	Dr Joel Denty	+677-21478	
3	Regular meeting to check the effectiveness of the system developed with respect to Action Plan	MHMS, Guadalcanal Province, HEC, THL, PO	MHMS: Dr Gregory Jilini Guadalcanal Province: Dr Joel Denty HEC: Mr. Moon, Project Manager THL: Mr. Lee, CFO PO: Mr. Fred, Deputy Manager		The meeting shall be called by PO at least every Six months and chaired by MHMS, Under Secretary, Dr Gregory Jilini.

Awareness training to Workers and Communities						
Sl No	**Name of the Organization**	**Awareness**	**Target Audience**	**Contact person**	**Frequency**	**Remarks**
1	Malaria Department, Guadalcanal Province	Mosquito borne diseases (Malaria, dengue and Zika)	Community Members and Workers	Mr. Francis Otto +677-7776718 guadalcanalprovincemalariadivi@gmail.com	Once in every 6 months throughout the Project Construction period.	
2	MHMS, National Surveillance Unit.	Mosquito Borne Diseases	1. Community Members and Workers.	Mr Albino Bobagare	Once in every 6 months throughout	

Prepared by:		Checked by		Acknowledged by:		Approved by	
Hyundai Engineering Company		Tina Hydropower Limited		TRHDF PO		MHMS	

		and its prevention and Control.	2. Provide guidance to workers engaged in control measures	Albino.bobogare@moh.gov.sb +677-7779131 Mr Charles Butafa Charles.Butafa@moh.gov.sb	the Project Construction period.	
3	MHMS, HIV AIDS and STI	HIV, AIDS and STI	Community Members and Workers	Dr Jackson Rakei, Medical Officer, HIV/STI Program (MHMS) jrakai@moh.gov.sb 28210	Once in every 6 months throughout the Project Construction period.	
5	MHMS, Health and Nutrition Department	Healthy eating	Community Members and Workers	Mr. M Taro, Nutrition Unit mtaro@moh.gov.sb +677-7360005/21202	Once in every 6 months throughout the Project Construction period.	Regular awareness trainings provided in communities on: Health, Nutrition, Sanitation and Malaria.
6	MHMS, Non Communicable Disease,	Non Communicable disease	Community Members and Workers	Mrs. Nevalyn Laesango nlaesango@moh.gov.sb 28199	Once in every 6 months throughout the Project Construction period.	Awareness programs conducted on regular basis on subjects: a. Healthy Lifestyle b. Diabetes prevention c. Risk factors-nutrition and stress d. Breast cancer and cervical cancer e. Medical check-up conducted during program by doctors.
Activities for Vector Surveillance. Monitoring and Control						
Sl	**Activity**	**Area/Targets**	**Responsible Department of MHMS**	**Contact Persons of MHMS**	**Frequency**	**Remarks**
1	Vector Surveillance of Project Area	Workers Camp and Project DIA and WIA	National Disease Vector Programme	Mr Albino Bobagare Albino.bobogare@moh.gov.sb +677-7779131	Once a year or after a disaster (floods, cyclone) or outbreak.	

Prepared by:		Checked by		Acknowledged by:		Approved by	
Hyundai Engineering Company		Tina Hydropower Limited		TRHDP PO		MHMS	

				Mr Charles Butafa Charles.Butafa@moh.gov.sb		
2	Mosquito Net treated with deltamethrin (1 for each person)	Project DIA and WIA	National Disease Vector Programme Guadalcanal Province Malaria Department	Mr Albino Bobagare Albino.bobogare@moh.gov.sb +677-7779131 Mr Charles Butafa Charles.Butafa@moh.gov.sb Mr. Francis Otto +677-7776718 guadalcanalprovincemalariadivi@gmail.com	Once in three years Provided by GP Malaria Department	
3	Indoor Residual Spraying	Workers Camp	Guadalcanal Province Malaria Department	Mr. Francis Otto +677-7776718 guadalcanalprovincemalariadivi@gmail.com	Every 6 months and in the event of outbreak or Disaster(Cyclone, flood)	Chemical can be arranged by Hyundai Engineering company on receipt of details from MHMS. Allowances can be provided to field officers for works.
4	Exterior Residual Spraying	Workers Camp	Guadalcanal Province Malaria Department	Mr. Francis Otto +677-7776718 guadalcanalprovincemalariadivi@gmail.com	Every 6 months and in the event of outbreak or Disaster(Cyclone, flood)	Chemical can be arranged by Hyundai Engineering company on receipt of details from MHMS. Allowances can be provided to field officers for works.
5	Ultra Low Volume Fogging	Workers Camp and Project DIA and WIA	Guadalcanal Province Malaria Department	Mr. Francis Otto +677-7776718 guadalcanalprovincemalariadivi@gmail.com	Every two weeks	Chemical can be arranged by Hyundai Engineering company on receipt of details from MHMS. Allowances can be provided to field officers for works.

Prepared by:		Checked by		Acknowledged by:		Approved by	
Hyundai Engineering Company		Tina Hydropower Limited		TRHDP PO		MHMS	

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

Purpose:

This document provides a procedure of COVID-19 preparations. The Project has to work with all stakeholders as well as public health partners, to respond to this situation.

COVID-19 General Information:

COVID 19 is described as a pandemic of respiratory disease spreading from person-to person caused by a novel (new) coronavirus. The disease has been named "coronavirus disease 2019" (abbreviated "COVID-19"). This situation poses a serious public health risk. COVID-19 can cause mild to severe illness; most severe illness occurs in older adults. Adults with a disease history are more vulnerable to this disease.
Up to date there are no positive cases reported for Guadalcanal Province and none reported for the country. All 13 samples sent to Australia for testing have returned negative. Although there are no positive cases as yet, as has been stressed, there is no reason for complacency in preparations and community participation in prevention and spread of COVID19.

Symptoms:

COVID-19 Symptoms may appear 2-14 days after exposure and have been described as but not limited to:

- Fever
- Shortness of breath
- dry cough

Emergency Medical Conditions

Severe symptoms requiring immediate medical attention include but not limited to:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion or inability to arouse
- Bluish lips or face

How The Virus Is Transmitted?

The virus is thought to be spread primarily from person to-person transmission inclusive of the following:

- People who are in close proximity, generally less than 6 feet, with other people who are infected

• Respiratory droplets produced when an infected person coughs or sneezes which can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs

• Touching a surface or object that has COVID-19 on it and then touching one's own mouth, nose, or possibly the eyes.

Other Notes

The following should be considered:

• A person may NOT have a fever and yet still be a carrier of the virus

• People are most contagious when they are symptomatic, for example, experiencing fever, cough, and/or shortness of breath

• Asymptomatic and mildly symptomatic individuals can and also spread COVID-19

• A person without an elevated temperature does not mean he/she has a clean bill of health

• There have been numerous reports of inaccurate temperature readings from the forehead scan type thermometer

• Temperature testing does NOT ensure there is no communicable disease in the workplace and does not prevent the spread of disease

• Many cases are referred to as asymptomatic, which means that some individuals report no symptoms at all, but can still be carriers of the virus and can infect others

Screening

HSE Manager shall maintain contact with Guadalcanal Province-Health Promotion team and MHMS Emergency Health and Surveillance unit regarding the rapidly changing COVID-19 protocols and COVID-19 testing arrangements and locations. The following are mandates currently in place in the Solomon Islands for entry of foreigners entering into country:

- Prior approval is sought from the Prime Minister's Office for entry into Solomon Islands through scheduled repatriation Flights. After the publication of list of travelers, a ticket can be booked in the flight.
- Quarantine period is mandatory for 14 to 24 days depending on the assessment of the MHMS and Government in the Government approved Quarantine facility.
- After the completion of Quarantine, testing is conducted at the medical facilities and then relieved.

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

- After the quarantine period, and prior to being deployed to remote job sites, personnel shall be screened current symptoms (i.e. fever, dry cough, difficulty in breathing, and/or fatigue) and Temperature.
- Personnel who do not pass the screening criteria shall not be allowed to mobilize to the jobsite and shall remain in isolation until the employee is clear from any symptoms and/or has been deemed safe to return to work by a medical professional.
- Site Supervisors shall remain diligence in making sure that personnel are healthy and fit for work and shall remove, quarantine and report any employee who exhibits the above symptoms.

Prior to mobilization

Administration team (HR and Admin Manager) shall ensure that every practical effort has been made to provide for the following:

- That personnel are healthy and ready for work
- All necessary housing and transportation have been arranged
- Availability and/or delivery of Food (or food service)
- Project materials and supplies have been obtained or located
- Acquisition of all required PPE, First-Aid response kits and consumables

Social Distancing

In accordance with WHO and other Government guidelines and recommendations, Management shall implement Social Distancing procedures to help limit or minimize contact between personnel and other people to help stop the transmission and prevention of the coronavirus. Social Distancing procedures shall include the following at a minimum and shall be updated as conditions, guidelines and recommendations change:

- Avoid gatherings of any size both internal and external to operations
- Perform meetings online or via conference call whenever possible
- Discontinue contact greetings such as hugs and handshakes
- Avoid physical contact and practice social distancing, including keeping at least 6 feet of separation from others when possible
- Discontinue collection of handwritten or iPad signatures for safety meetings and instead have the on-site supervisor document meetings and attendance

- Do not congregate in lunch or break room areas
- Have staggered break and lunch times when possible to prevent multiple personnel from being in the same location at the same time
- Limit the number of personnel in a single vehicle to avoid physical contact
- Provide single status rooms
- Allow only essential critical infrastructure personnel and stake holders on locations
- Require all non-essential personnel to work from home when feasible
- Limit face-to-face interactions as much as possible
- Limit trips to populated areas to essential travel for necessities only.

Sanitizing/Housekeeping

It is recommended the following cleaning and sanitizing measures in the workplace and at home:

- Cleaning refers to the removal of germs, dirt, and impurities from surfaces. Cleaning does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. Clean soiled surfaces before disinfecting.
- Disinfecting refers to using chemicals to kill germs on surfaces. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection.
    1. A simple disinfecting solution of 1/3 cup of bleach to one gallon of water will kill the coronavirus
    2. Isopropyl alcohol 70% or greater will kill the coronavirus
    3. Other disinfectants
- Ensure that all surfaces and common shared surfaces are cleaned and disinfected daily, including cell phones, computers, table-tops, desktops, doorknobs, copy machine buttons, touch screens, phone receivers, key boards, light switches, faucets handles, hand and power tools, construction equipment, vehicles, break rooms, restrooms, living quarters and all other work and residential areas.
- Ensure that clothing and bedding are laundered in the hottest water possible.
- Empty trash daily and have a separate closed trash receptacle for disposal of potentially contaminated waste, such as PPE, tissues, food waste, paper towels, disposable plates, cups and utensils
- Clean and disinfect trash cans

- Clean and disinfect surfaces of service and fleet vehicles prior to use, including steering wheels, gear shifters, instrument panels, door handles, control knobs and switches.

Personal Hygiene

Personal Hygiene is crucial to stopping the spread of COVID-19. In order to help stop the spread of germs at work it is critical that personnel practice the following:

- Frequent hand washing for 20 seconds with soap and water, or utilizing hand sanitizer
- Cover nose and mouth when coughing or sneezing with arm or tissue, dispose of tissue after use and wash hands after coughing or sneezing
- If possible, do not share tools. Disinfect tools between use by separate employees
- Do not share personal protection equipment (PPE)
- Sanitize reusable PPE per manufacturer's recommendation prior to each use
- Ensure used PPE is disposed of properly and ensure that proper decontamination methods are used when in contact with known COVID-19 contaminated areas
- Utilize disposable gloves where appropriate and wash hands after removing gloves
- Disinfect reusable supplies and equipment
- Utilize disposable hand towels and no-touch trash receptacles
- Request frequent cleaning and sanitation of portable toilets
- Ensure that cleaning and sanitizing supplies are available to employees so that they may clean their work surfaces in their workspaces daily
- Provide reminders and time to the employees to clean their workspaces
- Avoid touching face, especially eyes, nose and mouth

Self-Quarantine If Sick

It is critical that individuals NOT report to work while they are experiencing illness symptoms such as fever, cough, shortness of breath, sore throat, runny/stuffy nose, body aches, chills, or fatigue – Personnel shall inform their supervisor immediately, self-quarantine, stay isolated from others and should seek medical attention if they develop these symptoms!

If an employee becomes sick at work the HSE Manager shall:

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

- Isolate and return infected personnel home as quickly as possible
- Notify the Project Manager immediately upon discovering symptoms
- Limit interaction to one person for taking care of personnel who are quarantined
- Follow guidelines and seek medical help to care for individuals in quarantine.

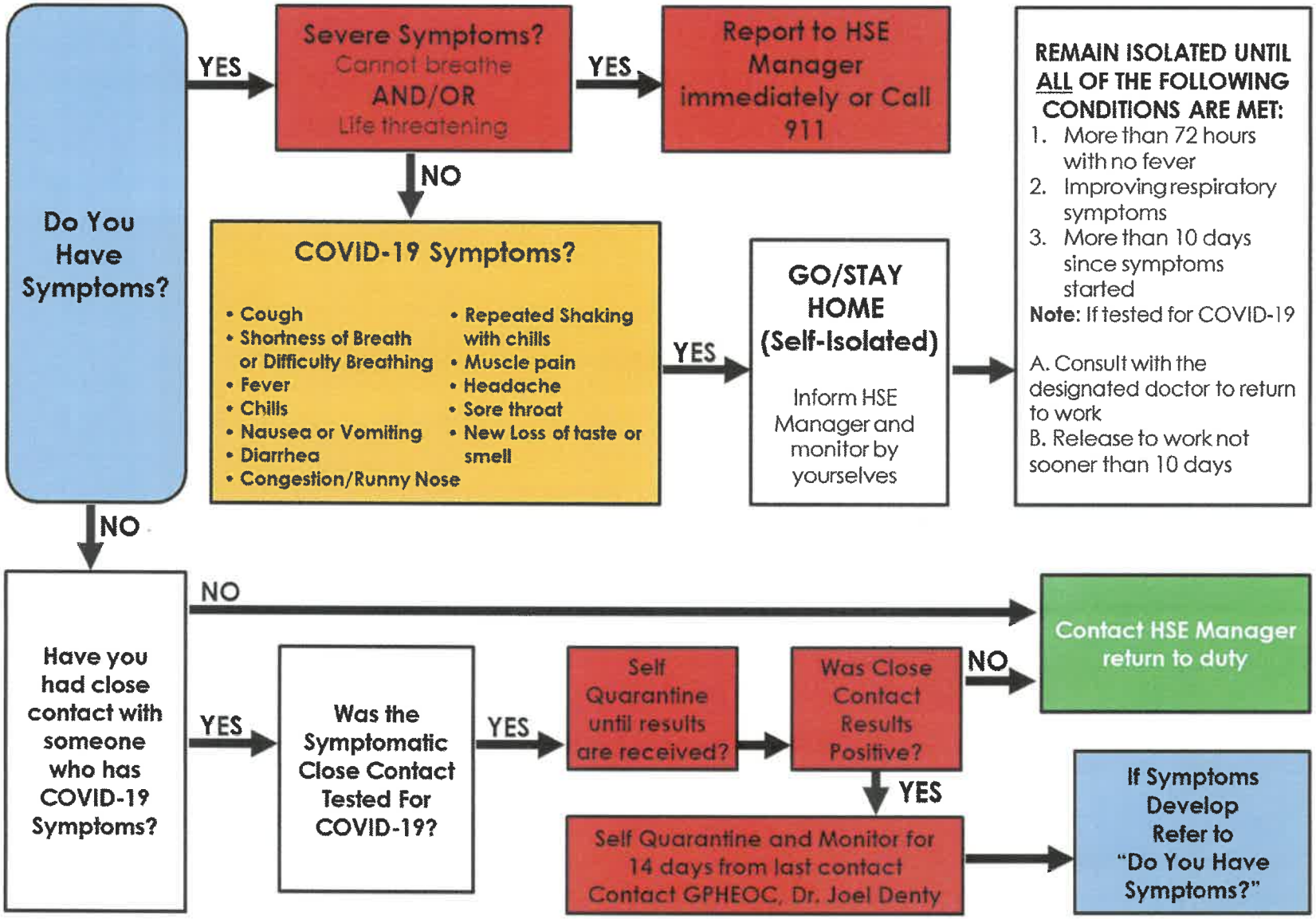
Note:

1. Copy of COVID 19 Protocol shall be electronically shared to all the employees and shall be informed through meetings and toolbox talks.
2. Posters shall be put at workplace and common spaces.
3. Personal Hygiene and hand wash instructions at the washrooms and toilets.

Emergency Response

Prepared by: HEC		Checked by: THL		Acknowledged by: TRHDP PO		Approved by: MHMS	

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project



Prepared by: HEC		Checked by: THL		Acknowledged by: THDP PO		Approved by: MHMS	

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

Stock-PPE

Government

Commodity	Unit	Total	NMS	NRH
Sharps container Boxes	Each/Item	15,308	14,608	700
Gloves – Nitrile	Total			
Small	Each/Item	1,200	1,200	
Medium	Each/Item	56,000	56,000	
Large	Each/Item	182,400	182,400	
Gloves – Latex	Total	2,360,400		
Small	Each/Item	254,400	158,400	96,000
Medium	Each/Item	1,817,200	1,748,200	69,000
Large	Each/Item	1,684,500	1,605,500	79,000
Masks- Medical/Surgical	Each/Item	143,400	137,600	5,800
Medical Resp. N95	Each/Item	4,490	1,790	2,700
Face Shield	Each/Item	2,012	2,012	
Apron, heavy duty	Each/Item	2,000		2,000
Gown-Single, dispose Level1	Each/Item	590	260	330
Single overall zip Level 2	Each/Item	2,274	1,949	325
Single gown Level 3	Each/Item	204		204
Goggles, Protective	Each/Item	1,778	1,764	14
Chlorine(1kg)	1g tablet	2,016		2,016
Alcoholic Hand rub	1Litre	8,957	8,866	91
Antiseptic Soap	Each/Item	11,554	11,420	134
Shoe cover disposable	Each/Item	4,100	4,100	
PVC Gum Boot	Each/Pair	30		30
Hair/Head Cover	Each/Item	4,730	4,730	

HEC

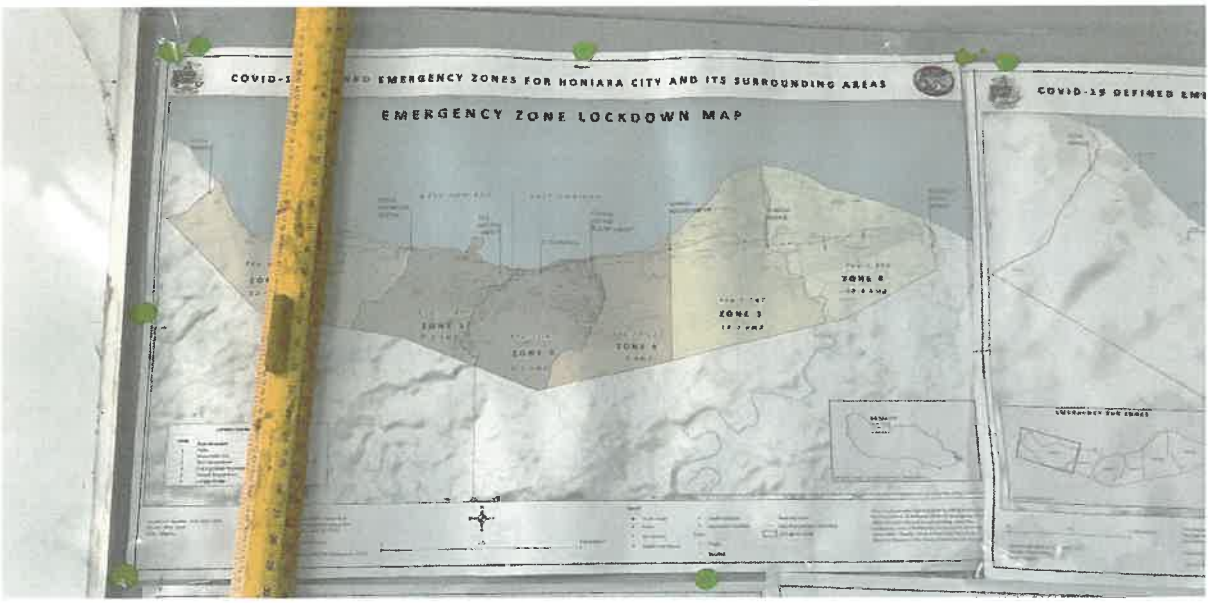
Commodity	Unit	Quantity	Total	Remark
Mask Type A	BOX	2	100EA	DUST MASK(50EA)
Mask Type B	BOX	5	250EA	FACE MASK(50EA)
HAND WASH	EA	16	Office-2, Accommodation-6	500ML

Prepared by: HEC		Checked by: THL		Acknowledged by: THDP PO		Approved by: MHMS	

HAND WASH	EA	20	For Personnel	Dettol(200ML)
Thermometer	EA	5	Each Department	-
Food	Month	2	for 2month	Korea Resturant(74 94584)
Food	Month	3	for 3month	Hansot(79 34228)
Water	box	20	550ml, 1.5liter	Vfresh(78 29668)

Community Awareness Program

Although there are no positive cases as yet, as has been stressed, there is no reason for complacency in preparations and community participation in prevention and spread of COVID-19. State of emergency was declared, the current boundary for state of emergency extends from GP boundary of Alligator to Poha area as below. The project site is not included in this boundary.



COVID-19 Awareness Program has been completed by Social Mobilization Leader, Aloysius Vakeke of GPHEOC for below villages.
The Villages within the project area already got the awareness program. And if required, they will provide awareness program to villages and random check if the villagers are well informed.

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

Emergency Contact Information:

#	Name	Designation	Organization	Contact Information	Remarks
Ministry of Health and Medical Services					
1	National Referral Hospital		MHMS	+677-25256/44000	
2	Ambulance Service		MHMS/St John	911	
3	Police Operations Centre		RSIPF	+677-27891	
4	Dr. Joel Denty	Incident Controller	Guadalcanal Provincial Health Emergency Operations Centre	+677-7492716	

Prepared by: HEC		Checked by: THL		Acknowledged by: TRHDP PO		Approved by: MHMS	

5	Dr. Chanel Sabino	Clinical & Isolation Leader	GPHEOC	+677-7492716	
6	Aloysious Vakeke	Social Mobilization Leader	GPHEOC	TBC	
7	Charles Bunia	Pharmacy & Supplies Leader	GPHEOC	TBC	
8	Alfred Mae, Jackson Beikera	Surveillance Leaders	GPHEOC	TBC	
9	Derrick Willie	Quarantine Leader	GPHEOC	TBC	
Hyundai Engineering Company					
1	Chung Ryul Ha	Site Manager	Hyundai Engineering Company	+677-7279982	
2	Euiman Moon	Project Manager		+677-7584604	
3	Daeyong Kim	HSE Manager		+677-7411755	
4	Patrick Kkekete	Training Supervisor		+677-7791692	First Aid Trained
5	Jonathon Nonosala	H and S Supervisor		+677-7382076	First Aid Trained
6	Doghlous Rebasi	H and S Staff		+677-7182805	
7	Trevor Hardfield	H and S Staff		+677-7665131	
8	Ernest Kolly	E and S Supervisor		+677-7588103	First Aid Trained
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Project Office					
1	Fred Conning	Deputy Project Manager	TRHDP PO, MMERE	+677-7119096	
Tina Hydropower Limited					
1	Jaeil Ryoo	CEO	THL	+677-7975259	
2	Jihun Lee	CFO		+677-7653985	

Hand Wash Instructions Poster

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

STOP THE SPREAD OF GERMS AT WORK

COVER YOUR MOUTH AND NOSE WHEN YOU SNEEZE OR COUGH.
Cough or sneeze into a tissue and then throw it away; use your arm or sleeve to cover if you do not have a tissue.

CLEAN YOUR HANDS OFTEN.
Wash your hands with soap and water, vigorously rubbing together front and back for 20 seconds. Or use alcohol-based hand sanitizers, rubbing hands until they are dry.

CLEAN SHARED SURFACES AND EQUIPMENT OFTEN.
Use disinfectants to clean commonly touched items such as doorknobs, faucet handles, copy machines, coffee pot handles, desktops, handrails, microwave buttons, keyboards, and elevator buttons. Germs travel fast with multiple hands touching shared surfaces.

AVOID TOUCHING YOUR EYES, NOSE OR MOUTH.
Germs need an entry point, and the average adult touches his or her face once every three or four minutes. Keep hand sanitizer at your desk to use after meetings or before grabbing one of those doughnuts from the breakroom.

STAY HOME WHEN YOU ARE SICK AND CHECK WITH A HEALTH CARE PROVIDER WHEN NEEDED.
When you are sick or have flu symptoms, stay home, get plenty of rest and check with a health care provider as needed.

SHRM
BETTER WORKPLACES BETTER WORLD

ANNEX P-10-IV COVID-19 PROTOCOL

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

Purpose:

This document provides a procedure of COVID-19 preparations. The Project has to work with all stakeholders of the project as well as public health partners (Guadalcanal Provincial Health Department, National Referral Hospital, St John Ambulance), to respond to this situation.

COVID-19 General Information:

COVID 19 is described as a pandemic of respiratory disease spreading from person-to person caused by a novel (new) coronavirus. The disease has been named "coronavirus disease 2019" (abbreviated "COVID-19"). This situation poses a serious public health risk. COVID-19 can cause mild to severe illness; most severe illness occurs in older adults. Adults with a disease history are more vulnerable to COVID-19.

As on 5th of November 2020, a total of 13 positive cases with 0 deaths have been reported[1]. The first case was detected on 4th of October 2020. The transmission classification for Solomon Islands by WHO is: Sporadic Cases. All the cases were from the passengers of the repatriation flights. These cases were detected in the Quarantine centers during the regular testing as per the protocols of Government.

Symptoms:

COVID-19 Symptoms may appear 2-14 days after exposure and have been described as but not limited to:

- Fever
- Shortness of breath
- dry cough

Note: Some cases may also be asymptomatic which means showing no symptoms.

Emergency Medical Conditions

Severe symptoms requiring immediate medical attention include but not limited to:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion or inability to arouse
- Bluish lips or face

How The Virus Is Transmitted?

[1] Source: https://covid19.who.int/region/wpro/country/sb

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

The virus is thought to be spread primarily from person to-person transmission inclusive of the following:

• People who are in close proximity, generally less than 6 feet, with other people who are infected

• Respiratory droplets produced when an infected person coughs or sneezes which can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs

• Touching a surface or object that has COVID-19 on it and then touching one's own mouth, nose, or possibly the eyes.

Other Notes

The following should be considered:

• A person may NOT have a fever and yet still be a carrier of the virus

• People are most contagious when they are symptomatic, for example, experiencing fever, cough, and/or shortness of breath

• Asymptomatic and mildly symptomatic individuals can and also spread COVID-19

• A person without an elevated temperature does not mean he/she has a clean bill of health

• There have been numerous reports of inaccurate temperature readings from the forehead scan type thermometer

• Temperature testing does NOT ensure there is no communicable disease in the workplace and does not prevent the spread of disease

• Many cases are referred to as asymptomatic, which means that some individuals report no symptoms at all, but can still be carriers of the virus and can infect others

Screening

HSE Manager shall maintain contact with Guadalcanal Province-Health Promotion team and MHMS Emergency Health and Surveillance unit regarding the rapidly changing COVID-19 protocols and COVID-19 testing arrangements and locations. The following are mandates currently in place in the Solomon Islands for entry of foreigners entering into country:

- Prior approval is sought from the Prime Minister's Office for entry into Solomon Islands through scheduled repatriation Flights. After the publication of list of travelers, a ticket can be booked in the flight.

- Quarantine period is mandatory for 14 to 24 days depending on the assessment of the MHMS and Government in the Government approved Quarantine facility. The various quarantine facilities being used by the Government are:
    - National Referral Hospital Isolation Unit is being used for positive cases.
    - King Solomon Hotel, Point Cruz
    - Heritage Park Hotel, Mendana Avenue
    - Pacific Casino Hotel, Kukum Highway
    - Guadalcanal Beach Resort, Henderson
    - Vimo Apartment, Henderson
    - Access Unit, Henderson
    - Airport Motel, Henderson
    - Chengs, Henderson

  The testing during Quarantine is done by MHMS in the Quarantine facilities as per "Quarantine period and testing requirements as per Part 3 Section 20-23 of Emergency Powers(Covid 19)(No 3) (Amendment no 2) Regulation 2020.[2] Usually for a personnel travelling from high risk countries, the quarantine period is 3 weeks and the testing is conducted as per the following
    - Test No 1: within 48hr from start of quarantine period
    - Test No 2: after 1 weeks from start of quarantine period
    - Test No 3: after 2 weeks from start of quarantine period
    - Test No 4: 2 ~ 3 days before end of quarantine period
- After the quarantine period, and prior to being deployed to remote job sites, personnel shall be screened current symptoms (i.e. fever, dry cough, difficulty in breathing, and/or fatigue) and Temperature (less than 37.5 degrees C).
- Personnel who do not pass the screening criteria shall not be allowed to mobilize to the jobsite and shall remain in isolation at an accommodation located near Henderson airport which can accommodate 3 persons until the employee is clear from any symptoms and/or has been deemed safe to return to work by a medical professional(Project Doctor, Dr. Pedical). Additionally, After the camp is occupied and considering an increased number of workers after the start of construction, a dedicated building (likely the HEC Local house, which will not be occupied until peak dam construction) can be used for isolation of suspected cases.
- Project Doctor, Dr. Pedical can be called on for consultation and support during isolation and if further assistance is required it shall be sought from National Referral Hospital. Since HEC has not yet established the clinic at the office area, the workers are sent to his clinic located at Capital Park, Honiara for regular health checkup and consultations (whenever required).
- Site Supervisors shall remain diligence in making sure that personnel are healthy and fit for work and shall remove, quarantine and report any employee who

[2] Quarantine period and testing requirements as per Part 3 Section 20-23 of Emergency Powers (COVID 19) (No 3) (Amendment no 2) Regulation 2020 is prepared by National Emergency Operations Center (NEOC) and was last updated on 20th October 2020, 5:28:31 PM.

exhibits the above symptoms. Two thermal imaging camera has been installed at the HEC office (Honiara, and eventually the temporary site office) which monitors the temperature automatically. Every morning all the employees are scanned for temperature using a contactless Infra-red thermometer prior to entering into the office.

Prior to mobilization

Administration team (HR and Admin Manager) shall ensure that every practical effort has been made to provide for the following:

• That personnel are healthy and ready for work before being brought in to Solomon Islands. As of now, The Solomon Island Government has stated conditions of being tested with RT PCR test prior to entering.

• All necessary housing and transportation have been arranged. Since the personnel being brought in are to be in paid Quarantine centers, arrangements have to be made with the Hotel and the authorities for accommodation.

• Availability and/or delivery of Food (or food service) to the personnel in quarantine. For the regular food materials, HEC has secured 6 months' worth of food supplies through cargo ship, imported from Korea. The canteen will be operated only for non-local workers. The Administration Team can organised for packed meals to be made available to local workers from the canteen if required.
Further, we're procuring vegetables and perishable foods from Korean restaurants/Food supplier in Honiara, and they get their supplies from a number of local suppliers and open market. They can meet HEC's requirements for food materials in terms of quantity and availability. The suppliers have been well informed about this kind of scenario which may arise.

• Toiletries, sanitizers and other items required by the personnel during the period of quarantine shall be arranged and provided to the employees through the management of Quarantine facility authorities.

• Acquisition of all required PPE, First-Aid response kits and consumables

Social Distancing

In accordance with WHO and other Government guidelines and recommendations, Management shall implement Social Distancing procedures to help limit or minimize contact between personnel and other people to help stop the transmission and prevention of the coronavirus. Social Distancing procedures shall include the following at a minimum and shall be updated as conditions, guidelines and recommendations change:

- Avoid gatherings of more than 5 people both internal and external to operations
- Perform meetings online or via conference call whenever possible
- Discontinue contact greetings such as hugs and handshakes
- Avoid physical contact and practice social distancing, including keeping at least 6 feet of separation from others when possible
- Discontinue collection of handwritten or iPad signatures for safety meetings and instead have the on-site supervisor document meetings and attendance
- Do not congregate in lunch or break room areas
- Have staggered break and lunch times when possible to prevent multiple personnel from being in the same location at the same time
- Limit the number of personnel in a single vehicle to avoid physical contact. The vehicles shall be operated with the driver plus 1 passenger who sits in rear seat, and both wear a face mask.
  All vehicles should carry a cleaning kit (disinfectant, wipes, hand sanitizer, face masks, bags for rubbish) and the vehicle is cleaned between uses (if shared)
- Provide single status rooms
- Allow only essential critical infrastructure[3] personnel and stake holders on locations
- Require all non-essential personnel to work from home when feasible
- Limit face-to-face interactions as much as possible
- Limit trips to populated areas to essential travel for necessities only. The following activities shall be considered as essential services and shall be allowed:
    - To obtain fuel and food items, and drinking water
    - To buy medication, cleaning/medical supplies or to seek medical assistance.
    - To obtain items for emergency repairs (e.g. parts for generator, to make the site safe)

Sanitizing/Housekeeping

[3] essential personnel: kitchen staff, housekeepers, project medical staff and external stakeholders; South Pacific Oil for fuel refilling, MHMS if required and any other services associated with fuel, electricity, hospital, water and food material.

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It is recommended the following cleaning and sanitizing measures in the workplace and at home:

- Cleaning refers to the removal of germs, dirt, and impurities from surfaces. Cleaning does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. Clean soiled surfaces before disinfecting.
- Disinfecting refers to using chemicals to kill germs on surfaces. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection.
    1. A simple disinfecting solution of 1/3 cup of bleach to one gallon of water will kill the coronavirus
    2. Isopropyl alcohol 70% or greater will kill the coronavirus
    3. Other disinfectants
- Ensure that all surfaces and common shared surfaces are cleaned and disinfected daily, including cell phones, computers, table-tops, desktops, doorknobs, copy machine buttons, touch screens, phone receivers, key boards, light switches, faucets handles, hand and power tools, construction equipment, vehicles, break rooms, restrooms, living quarters and all other work and residential areas.
- Ensure that clothing and bedding are laundered in the hottest water possible.
- Empty trash daily and have a separate closed trash receptacle for disposal of potentially contaminated waste, such as PPE, tissues, food waste, paper towels, disposable plates, cups and utensils
- Clean and disinfect trash cans
- Clean and disinfect surfaces of service and fleet vehicles prior to each use (when shared), including steering wheels, gear shifters, instrument panels, door handles, control knobs and switches. Otherwise all vehicles shall be cleaned and disinfected once daily by the designated vehicle driver.

Personal Hygiene

Personal Hygiene is crucial to stopping the spread of COVID-19. In order to help stop the spread of germs at work it is critical that personnel practice the following:

- Frequent hand washing for 20 seconds with soap and water, or utilizing hand sanitizer (with a minimum of 70% alcohol content)
  when hand washing is not available. Wash hands before and after eating, using the bathroom, coughing/sneezing.
- Cover nose and mouth when coughing or sneezing with arm or tissue, dispose of tissue after use and wash hands after coughing or sneezing

- If possible, do not share tools. Disinfect tools between use by separate employees
- Do not share personal protection equipment (PPE)
- Sanitize reusable PPE per manufacturer's recommendation prior to each use
- Ensure used PPE is disposed of properly and ensure that proper decontamination methods are used when in contact with known COVID-19 contaminated areas
- Utilize disposable gloves where appropriate and wash hands after removing gloves
- Disinfect reusable supplies and equipment
- Utilize disposable hand towels and no-touch trash receptacles
- Request frequent cleaning and sanitation of portable toilets
- Ensure that cleaning and sanitizing supplies are available to employees so that they may clean their work surfaces in their workspaces daily
- Provide reminders and time to the employees to clean their workspaces
- Avoid touching face, especially eyes, nose and mouth

Self-Quarantine If Sick

It is critical that individuals NOT report to work while they are experiencing illness symptoms such as fever, cough, shortness of breath, sore throat, runny/stuffy nose, body aches, chills, or fatigue – Personnel shall inform their supervisor immediately, self-quarantine, stay isolated from others and should seek medical attention if they develop these symptoms.

If an employee becomes sick at work the HSE Manager shall:

- Isolate and return infected personnel home as quickly as possible
- Notify the Project Manager immediately upon discovering symptoms
- Limit interaction to one person for taking care of personnel who are quarantined
- Follow guidelines and seek medical help to care for individuals in quarantine.

Note:

1. Copy of COVID 19 Protocol shall be electronically shared to all the employees and shall be informed through meetings and toolbox talks.
2. Posters shall be put at workplace and common spaces.
3. Personal Hygiene and hand wash instructions at the washrooms and toilets.

Emergency Response

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

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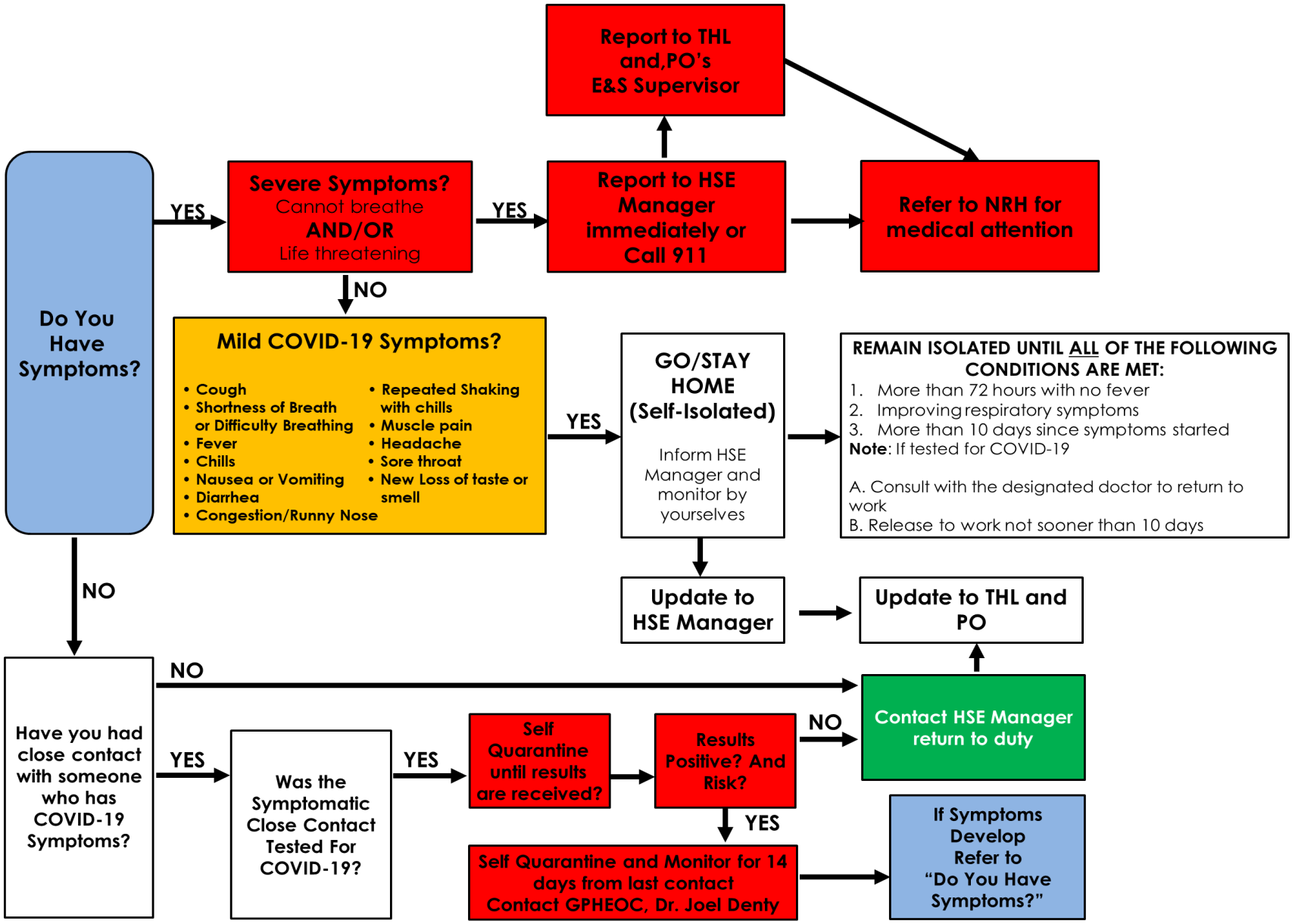

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Stock-PPE

Government

Commodity	Unit	Total	National Medical Store	National Referral Hospital
Sharps container Boxes	Each/Item	15,308	14,608	700
Gloves – Nitrile	Total			
Small	Each/Item	1,200	1,200	
Medium	Each/Item	56,000	56,000	
Large	Each/Item	182,400	182,400	
Gloves – Latex	Total	2,360,400		
Small	Each/Item	254,400	158,400	96,000
Medium	Each/Item	1,817,200	1,748,200	69,000
Large	Each/Item	1,684,500	1,605,500	79,000
Masks- Medical/Surgical	Each/Item	143,400	137,600	5,800
Medical Resp. N95	Each/Item	4,490	1,790	2,700
Face Shield	Each/Item	2,012	2,012	
Apron, heavy duty	Each/Item	2,000		2,000
Gown-Single, dispose Level1	Each/Item	590	260	330
Single overall zip Level 2	Each/Item	2,274	1,949	325
Single gown Level 3	Each/Item	204		204
Goggles, Protective	Each/Item	1,778	1,764	14
Chlorine(1kg)	1g tablet	2,016		2,016
Alcoholic Hand rub	1Litre	8,957	8,866	91
Antiseptic Soap	Each/Item	11,554	11,420	134
Shoe cover disposable	Each/Item	4,100	4,100	
PVC Gum Boot	Each/Pair	30		30
Hair/Head Cover	Each/Item	4,730	4,730	

HEC

Commodity	Description	Unit	Quantity	Total	Remark
Hand Sanitizer with dispenser	68% alcohol	250ml Bottles	28	7 liters	
Hand Sanitizer (bulk)	75% Alcohol	4 liter can	30	120 liters	
Face Mask	Disposable Dust	pcs	250	250	
Face Mask	N95	Pcs	100	100	
Hand wash	Liquid Soap based	1,000ml bottles	12	12 Liters	For office only, accommodations

Commodity	Description	Unit	Quantity	Total	Remark
					provided separately
Disinfectant	Floor Disinfectant antibacterial liquid	500ml bottles	20	10 liters	For office only, accommodations provided separately
Drinking Water	Packed Bottled water of 1.5l bottles	1.5 L X 12	40	720 liters	Additionally all the accommodations are provided with 15 boxes each of 1.5l bottles
Drinking Water	Packed Bottled water of 0.5l bottles	0.5 L X15	40	300 liters	
Infrared Thermometer		Units	6	6	
Infrared Thermal Imaging Camera		Units	2	2	
Food Material					Stocked for approximately 2 months
Disposable nitrile gloves		Units	100	100	Disposable
Full PPE kits		Units	100	100	Disposable
Safety Glasses	Anti-fog_	Units	40	40	
Shoe Cover		Units	100	100	Disposable
COVID-19 Test Kits	PCL COVID19 Rapid Gold-Antibody test kits	Units	100	100	
Food	Cargo Ship	Month	6	For 6 months	

Community Awareness Program

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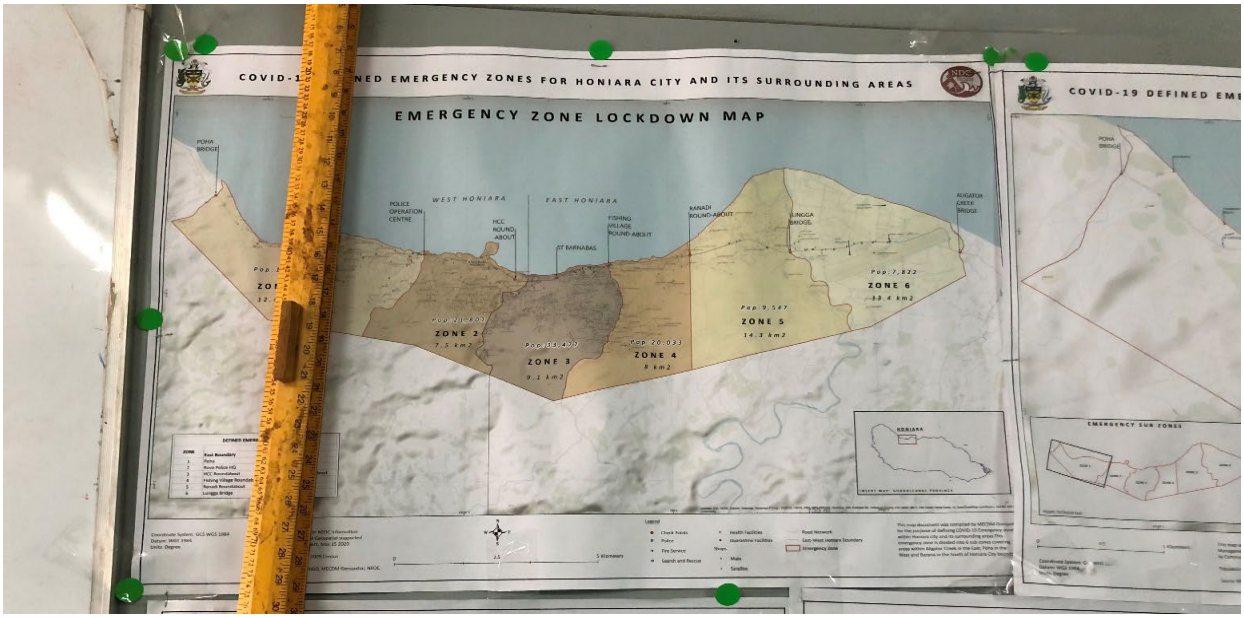
Although there are no positive cases as yet, as has been stressed, there is no reason for complacency in preparations and community participation in prevention and spread of COVID19. State of emergency was declared, the current boundary for state of emergency extends from GP boundary of Alligator to Poha area as below. The project site is not included in this boundary.



COVID-19 Awareness Program has been completed by Social Mobilization Leader, Aloysius Vakeke of GPHEOC for below villages.
The Villages within the project area already got the awareness program.

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Emergency Contact Information:

#	Name	Designation	Organization	Contact Information	Remarks
Ministry of Health and Medical Services					
1	National Referral Hospital		MHMS	+677-25256/44000	
2	Ambulance Service		MHMS/St John	911	
3	Police Operations Centre		RSIPF	+677-27891	
4	Dr. Joel Denty	Incident Controller	Guadalcanal Provincial Health Emergency Operations Centre	+677-7492716	
5	Dr. Chanel Sabino	Clinical & Isolation Leader	GPHEOC	+677-7492716	

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#	Name	Designation	Organization	Contact Information	Remarks
6	Aloysious Vakeke	Social Mobilization Leader	GPHEOC	TBC	
7	Charles Bunia	Pharmacy & Supplies Leader	GPHEOC	TBC	
8	Alfred Mae, Jackson Beikera	Surveillance Leaders	GPHEOC	TBC	
9	Derrick Willie	Quarantine Leader	GPHEOC	TBC	
Hyundai Engineering Company					
1	Chung Ryul Ha	Site Manager	Hyundai Engineering Company	+677-7279982	
2	Euiman Moon	Project Manager		+677-7584604	
3	Daeyong Kim	HSE Manager		+677-7411755	
4	Patrick Kkekete	Training Supervisor		+677-7791692	First Aid Trained
5	Jonathon Nonosala	H and S Supervisor		+677-7382076	First Aid Trained
6	Doghlous Rebasi	H and S Staff		+677-7182805	
7	Trevor Hardfield	H and S Staff		+677-7665131	
8	Ernest Kolly	E and S Supervisor		+677-7588103	First Aid Trained
9	Edmond Jr Bate	E and S Staff		+677-8477481	
10	Whitlam Kikolo	CLO		+677-7818626	
11	Daniel Una	CLO		+677-7445718	
12	Helen La'a	Female CLO		+677-7486657	
13	Dr. Pedical	Designated Doctor		+677-8576660	
Project Office					
1	Fred Conning	Deputy Project Manager	TRHDP PO, MMERE	+677-7119096	
Tina Hydropower Limited					

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

#	Name	Designation	Organization	Contact Information	Remarks
1	Jaeil Ryoo	CEO	THL	+677-7975259	
2	Jihun Lee	CFO		+677-7653985	

Hand Wash Instructions Poster

COVID 19 Protocol for Workplace:
Tina River Hydropower Development Project

STOP THE SPREAD OF GERMS AT WORK

COVER YOUR MOUTH AND NOSE WHEN YOU SNEEZE OR COUGH.
Cough or sneeze into a tissue and then throw it away; use your arm or sleeve to cover if you do not have a tissue.

CLEAN YOUR HANDS OFTEN.
Wash your hands with soap and water, vigorously rubbing together front and back for 20 seconds. Or use alcohol-based hand sanitizers, rubbing hands until they are dry.

CLEAN SHARED SURFACES AND EQUIPMENT OFTEN.
Use disinfectants to clean commonly touched items such as doorknobs, faucet handles, copy machines, coffee pot handles, desktops, handrails, microwave buttons, keyboards, and elevator buttons. Germs travel fast with multiple hands touching shared surfaces.

AVOID TOUCHING YOUR EYES, NOSE OR MOUTH.
Germs need an entry point, and the average adult touches his or her face once every three or four minutes. Keep hand sanitizer at your desk to use after meetings or before grabbing one of those doughnuts from the breakroom.

STAY HOME WHEN YOU ARE SICK AND CHECK WITH A HEALTH CARE PROVIDER WHEN NEEDED.
When you are sick or have flu symptoms, stay home, get plenty of rest and check with a health care provider as needed.

SHRM
BETTER WORKPLACES BETTER WORLD™

ANNEX P-10-V TRHDP SOCIO-ECONOMIC MONITORING FRAMEWORK

ANNEX P-10-V TRHDP SOCIO-ECONOMIC MONITORING FRAMEWORK

Additional information on community health management indicators and frequencies of collection.

Parameters	Indicators	Data Sources	Frequency
Population and Households			
Note: the indicators are to support the assessment of all community risks under CHDVMP			
Population size	Population count and changes since 2019 ward, enumeration area	Census 2019; and Household surveys	Census when available Mid-term (18 months after construction commence) Construction completion
Gender	Numbers of males and females in the population and in households	Census 2019; and Household surveys	Census when available Mid-term and Construction completion
Age structure	life stage cohorts, male and female Dependency ratio and household vulnerability		
Households in the project area	Number of households	Census 2019; and Village chiefs' reports (VCRs)	Census when available VCRs every 6 months
Household members	Number of members moving out and members moving in Reasons for mobility	Household surveys Focus Group Discussions (FGDs)	Mid-term and Construction completion
Characteristics of household members	gender, age, tribe, education, work/employment,	Household surveys	Mid-term and Construction completion

	relationship to HH head, working on Project		
Non-local HH members	household has non-local project worker member	Household surveys	Mid-term and Construction completion

Household Vulnerability

Note: the indicators are to support the assessment of all community risks under CHDVMP, in particular the risks to public safety

Disability	Number of household members with a disability or chronic illness Number of adult household members not able to work	Household surveys	Mid-term and Construction completion
Difficulties experienced	"serious" difficulties and shocks experienced in the previous 12 months	Household surveys	Mid-term and Construction completion

Human Capital

Note: the indicators are to support the assessment of all community risks under CHDVMP, in particular, the increased pressure on health services, influence presentations of non-communicable conditions, increased opportunity of vector borne diseases, spread of communicable disease, risks from soil and water contamination.

Nutrition	Changes in nutrition since 2020	Household surveys	Mid-term and Construction completion
Illness	Incidence of malaria, diarrhoea, STD, malnutrition, anaemia in hhds in past 3months	Household surveys	Mid-term and Construction completion

	Incidence of malaria, diarrhoea, STD, malnutrition, anaemia in hhds in past 12 months in community	local health clinics	Annually
Health services	Distance to nearest functioning health facility	Household surveys	Mid-term and Construction completion
	Attendance of HH member at health clinic, hospital, or doctor in past 3 months	Household surveys	Mid-term and Construction completion
	Perceived adequacy of health services	Household surveys Focus Group Discussions (FGDs)	Mid-term and Construction completion

Quality of Life – Mobility

Note: the indicators are to support the assessment of all community risks under CHDVMP

Accessibility	Adequacy of transport to schools, healthcare facilities, markets;	Household surveys Focus Group Discussions (FGDs)	Mid-term and Construction completion
	Distance to closest functioning health clinic	Household surveys	Mid-term and Construction completion

Quality of Life – Water and Sanitation

Note: the indicators are to support the assessment of all community risks under CHDVMP, in particular, increased opportunity of vector borne diseases, risks from soil and water contamination.

Drinking water Washing water and	Change in main sources of drinking, washing and	Household surveys	Mid-term and Construction completion

Sanitation water	sanitation water in either wet or dry season and reasons Impacts on community from change in water supply, if any Reason for change in source of bathing water source	Focus Group Discussions (FGDs)	
Sanitation	Changes in HH toilet arrangements since October 2020 Details of new arrangement and cost	Household surveys	Mid-term and Construction completion

Social Cohesion

Note: the indicators are to support the assessment of all community risks under CHDVMP, in particular, the risks related to movement of Project workforce from within and outside of the local community, mixing with the local community.

Conflict	Experience of intra community conflict in past 12 months	Household surveys	Mid-term and Construction completion
	Perceptions and experiences of community cohesion since commencement of TRHDP construction	Focus Group Discussions (FGDs)	Mid-term and Construction completion
	Experience of conflict with newcomers to area	Household surveys	Mid-term and Construction completion

Risk and Security

Note: the indicators are to support the assessment of all community risks under CHDVMP, in particular, the risks related to movement of Project workforce from within and outside of the local community, mixing with the local community.

Threats	Experience of threat to security of female HH members in past 12 months	Household surveys	Mid-term and Construction completion
	Experience of road accident by HH members in past 12 months	Household surveys	Mid-term and Construction completion
	Recorded road accidents in project area	Police	Every 6 months
	Experience of near road accident by HH members in past 12 months	Household surveys	Mid-term and Construction completion
	Perception of changes to communities' threat environment due to the Project (changes)	Focus Group Discussions (FGDs)	Mid-term and Construction completion
Crime	Experience of property theft in past 12 months	Household surveys	Mid-term and Construction completion
	Reported crime in district, incidents by type	Police	Every 6 months
Disorder	Incident of protest regarding project by village/location	project grievance register	Every 3 months
	Incidents of disorder at/near night club at Garivera	Police	Every 6 months

	Perception of security and stability in community	Focus Group Discussions (FGDs) VCRs	Mid-term and Construction completion VCRs every 6 months
Road danger	Experienced problems with traffic on access road	Household surveys	Mid-term and Construction completion
	Perception / rating of road dangers to community	VCRs	VCRs every 6 months
COVID-19	Perceived threat of diseases (incl. COVID-19) to the household	Household surveys	Mid-term and Construction completion