Rapid Risk Assessment

12th Pacific Mini Games, Palau

Mission dates: 12 – 15 November 2024

By:

Public Health Division – Pacific Community

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List of Abbreviations

BMI	Body Mass Index
CBRN	Chemical, Biological, Radiological or Nuclear
CDU	Communicable Disease Unit
CHOGM	Commonwealth Heads of Government Meeting
DDM	Data for Decision-Making
DEC	Disaster Executive Council
DEH	Division of Environmental Health
FOPA	Festival of Pacific Arts
GOC	Games Organizing Committee
ICP	Incident Command Post
IEC	Information, Education and Communication
IHR (2005)	International Health Regulations
MHHS	Ministry of Health and Human Services
MRT	Medical Records Technician
NCD	Non-Communicable Disease
NDRMF	National Disaster Risk-Management Framework
NGO	Non-Government Organisation
NVC	National Verification Committee
PMG	Pacific Mini Games
PG	Pacific Games
PGCFE	Post Graduate Certificate in Field Epidemiology
PHD	Public Health Division
PHEOP	Public Health Emergency Operations Plan
PICTS	Pacific Island Countries and Territories
PSSS	Pacific Syndromic Surveillance System
RCCE	Risk Communication and Community Engagement
RDSS	Reportable Disease Surveillance System
SHIP	Strengthening Health Interventions in the Pacific
SOP	Standard Operating Procedures
SPAR	State Part Annual Report

SPC	Pacific Community
STAR	Strategic Toolkit for Assessing Risks
STI	Sexually Transmitted Infection
VBD	Vector-Borne Diseases
WHO	World Health Organization

Contents

Background

The Pacific Community (SPC) involvement in the Pacific Games can be traced back to the very first Games. It was in 1959 at a meeting of SPC, then known as the South Pacific Commission, where the idea of holding the South Pacific Games was born and eventually adopted to strengthen bonds between Pacific Island countries and territories (PICTs). Assistance to enhanced mass gathering surveillance by SPC's Public Health Division (PHD) dates to 2012 during the 11th Festival of Pacific Arts in Solomon Islands (FOPA), and most recently in 2023 in Honiara, Solomon Islands for the 17th Pacific Games (PG) and in 2024 in Apia, Samoa for the Commonwealth Heads of Government Meeting (CHOGM).

On 15 April 2024, the PHD received a letter from the Honourable Gaafar Uherbelau, Minister of Health and Human Services (MHHS), Republic of Palau, requesting for assistance for enhanced mass gathering surveillance during the 12th Pacific Mini Games (PMG). On 25 April 2024, PHD Director Dr. Berlin Kafoa positively responded and indicated SPC commitment to support Palau MHHS.

A team from the PHD went on a mission in Koror, Palau to co-conduct a risk-based approach rapid risk assessment from 12 to 15 November 2024.

In this work, risk assessment involved 4 key steps: (i) identifying the hazards that are most likely to require a response or most likely to contribute to negative health outcomes for the mass gathering event; (ii) evaluating the likelihood that the identified hazards will occur during the mass gathering and require coordinated response in order to mitigate negative health outcomes; (iii) generating the risk score of the mass gathering based on hazards identified, and their likelihood of occurring; and (iv) determining the impacts should hazards occur during the mass gathering, including determining the ability of the country to respond to the hazard to mitigate further coping capacity.

Mission Objectives

In consultation with the MHHS team, three mission objectives were agreed upon:

- Assess the capacity of the Ministry of Health and Medical Services for communicable disease surveillance as an early warning system and response to outbreak alerts during the 12th Pacific Mini Games.
- Assess the risk of importation and exportation of infectious diseases immediately before, during, and two weeks after the 12th Pacific Mini Games.
- Propose countermeasures to identified gaps.

The assessment provides the basis for SPC's provision of support packages in the implementation of enhanced mass gathering surveillance during the 12th Pacific Mini Games in Koror, Palau.

In a Nutshell - Risks Associated with the 12th Pacific Mini Games

The World Health Organization (WHO) defines a mass gathering as 'an event attended by a sufficient number of people to strain the planning and response resources of a community, state or nation'[1].

[1] Abubakar I, Gautret P, Brunette GW, Blumberg L, Johnson D, Poumerol G, et al. Global perspectives for prevention of infectious diseases associated with mass gatherings. The Lancet infectious diseases. 2012 Jan;12(1):66-74.

For the Republic of Palau, the following challenges are associated with the mass gathering event: introduction of communicable diseases, influx of susceptible individuals, crowding, outbreaks of endemic or imported infectious diseases, opportunistic sale of food and beverages, increased risk behaviour associated with alcohol and other recreational substances, increased pressure on sanitary facilities, and heightened security levels.

Methodology

A review of written documents was done. Key informants were interviewed, and ocular inspections were conducted.

Guided by the Generic All-Hazards Risk Assessment and Planning Tool for Mass Gathering Events, based on the principles of the WHO Strategic Toolkit for Assessing Risks (STAR), priority hazards in 6 categories relating to hosting the 12th Pacific Mini Games in 2025 were identified and assessed: (i) general factors; (ii) venue factors; (iii) behavioural factors; (iv) epidemiological factors; (v) chemical, biological, radiological or nuclear (CBRN) and other security hazards; and (vi) environmental factors.

The identified hazards and the descriptors in evaluating the likelihood were incorporated into a Risk Matrix with the aim of providing a format for thinking about the relationship between the consequences and the likelihood of hazards. The matrix served as a tool in arriving at the overall risk assessment score.

Findings of the initial risk assessment were presented during a debrief meeting to the MHHS team on 15 November 2024.

Results

General Factors

The 12th Pacific Mini Games will take place from 29 June to 9 July 2025 in Koror, Palau. Republic of Palau, an archipelago of over 500 islands in Micronesia subregion in the western pacific ocean, has a population of 17,614 (2020 census). Sixty four percent of the population are residents of Koror.

National attendees from other states and islands of the Republic are expected to flock into Koror to participate in the event.

The Sports Committee of the Games Organizing Committee (GOC) in its 8 October 2024 meeting reported that 10 compulsory sports (athletics, archery, aquatic, basketball, volleyball [indoor and beach], judo, table tennis, triathlon, sprint and weightlifting) and 2 optional sports (baseball/softball and wrestling) will take place. An estimated 1,500 competitors from 24 countries in and around the Pacific are anticipated to participate in the games' events. International attendees from countries and jurisdictions outside of Palau will travel in mostly by commercial aircraft.

In addition to athletes and their delegation, arrival of other international tourists is also anticipated. The immigration tourism statistics[2] data, showed an increasing number of visitors arriving in Palau since the COVID-19 pandemic, though numbers are still lower than the recorded number in 2015

[2] Immigration Tourism Statistics - https://www.palaugov.pw/executive-branch/ministries/finance/budgetandplanning/immigration-tourism-statistics/

(Table 1). The 12th PMG is expected to further increase the number of tourists to arrive in Palau, especially in the months leading to and during the PMG.

Table 1. Number of visitors' arrival in Palau by year, 2015-2024*

Year	Visitors' arrivals in Palau (number)
2024 (January to June)	23,634
2023	35,052
2022	9,247
2021	3,400
2020	41,628
2019	89,379
2018	115,564
2017	121,670
2016	146,268
2015	168,424

**Source: Immigration Tourism Statistics*

Spectators are expected to be mostly standing in proximity while others will likely be engaged in mobile activities during the events. Singing, cheering, chanting or similar collective vocalisation is likely to occur.

Based on seasonal weather forecast provided by Climate Data, the forecasted average temperature in June and July in Palau is 26.8°C to 26.9°C, with a maximum temperature of 28°C, with average sun hours of 8.2 to 8.5 hours (Table 2).

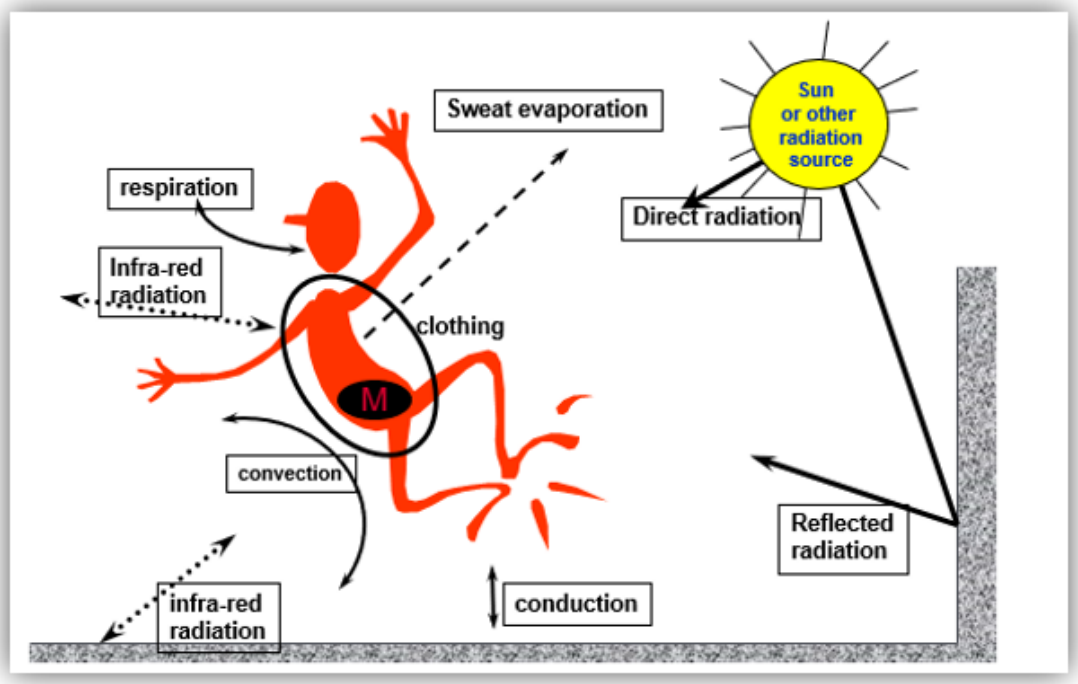
Table 2. Palau Weather by Month // Weather Averages

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	26.8 °C (80.3) °F	26.7 °C (80) °F	26.9 °C (80.4) °F	27.1 °C (80.9) °F	27.1 °C (80.8) °F	26.9 °C (80.4) °F	26.8 °C (80.2) °F	26.8 °C (80.2) °F	26.9 °C (80.4) °F	27 °C (80.6) °F	27.1 °C (80.8) °F	27 °C (80.7) °F
Min. Temperature °C (°F)	25.8 °C (78.5) °F	25.7 °C (78.2) °F	25.9 °C (78.5) °F	26.1 °C (78.9) °F	26 °C (78.7) °F	25.7 °C (78.2) °F	25.6 °C (78.1) °F	25.6 °C (78.2) °F	25.7 °C (78.2) °F	25.9 °C (78.6) °F	26 °C (78.8) °F	26 °C (78.8) °F
Max. Temperature °C (°F)	27.8 °C (82) °F	27.6 °C (81.7) °F	27.8 °C (82.1) °F	28.2 °C (82.7) °F	28.2 °C (82.8) °F	28 °C (82.5) °F	27.9 °C (82.2) °F	27.9 °C (82.1) °F	28 °C (82.4) °F	28.1 °C (82.6) °F	28.2 °C (82.7) °F	28 °C (82.4) °F
Precipitation / Rainfall mm (in)	245 (9)	209 (8)	170 (6)	188 (7)	282 (11)	360 (14)	347 (13)	279 (10)	279 (10)	262 (10)	267 (10)	272 (10)
Humidity(%)	82%	82%	81%	82%	83%	84%	83%	82%	82%	83%	83%	83%
Rainy days (d)	18	16	16	16	19	20	20	18	18	19	19	19
avg. Sun hours (hours)	8.2	8.3	8.6	8.6	8.3	8.2	8.5	8.7	8.5	8.3	8.0	8.0

Though the expected ambient temperature for the duration of the PMG is considered to cause moderate heat stress, a combination of other factors such as humidity, physical activity, and inadequate fluid intake may result to more severe heat stress[3] (Figure 1).

[3] Jendritzky, Gerd & de Bear, Richard. (2009). « Adaptation and thermal environnent. ». 10.1007/978-1-4020-8921-3_2.

Figure 1. Avenues of Heat Exchange – The Human Heat Budget (Havenith 2001)



Palau National Disaster Risk Management Framework listed a number of both natural disasters and human-induced hazards and risks to the economy and the population. These hazards and risks (see Table 3) were identified through stakeholder consultation as being those most likely to affect Palau.

Table 3: Natural and Man-made Hazards in Palau and Level of Risks [4]
(Source: National Disaster Risk Management Framework 2010, Amended 2016)

Natural Hazards	Level of Risk
Storm surge	High
Drought	High
Typhoon	High
Sea level rise (sea water intrusion), soil saline, coastal inundation and erosion	High
Tsunami	Low
Earthquake	Low
Human-induced Hazards	**Level of Risk**
Oil spill	High
Water contamination including sewerage	High
Solid waste disposal	High
Wildlife affecting aircraft movement	High
Increased sedimentation of watershed / coastal waters	High
Fire (industrial areas)	High
Fire (residential)	Medium
Invasive species	Medium
Hazardous substance spill	Medium
Emerging/infectious disease	High

[4] The list and the level of risk assessment was obtained from the National Disaster Risk Management Framework 2010 (amended 2016) and is not necessarily an indication of the risk for the Pacific Mini Games.

Terrorism/Civil unrest/UXO	Low
Structural collapse: bridges/causeways; water dams	Low
Power	Low
Communication	Low
Landslides	Low
Airport / port incidents	Low
Civil uprising	Low
Political instability	Low

Venue Factors

With 12 sporting events, multiple venues will be required, with some sports held indoors while some will be outdoors. Conditions for entry into the sporting facilities are unclear. Consequently, the proportion of venues' capacity that will be utilised is undefined, but likely to be higher than an estimated 75% capacity.

Seven months until the PMG, construction/refurbishment works on sports facilities have already been initiated but not completed.

There are concerns on planned Minatobashi Bridge construction work which will commence on 25 June 2025 as this may cause access problems especially for the Long Island venue meant for use in Beach Volleyball games with 19 countries registered to participate.

The indoor volleyball will require two courts. The Palau National Gym will be the primary place for the indoor volleyball. Court flooring has been installed. Second court is still wanting.

Swimming will be at the National Pool in Meyuns, and open water competition will be a KF Bridge (Koror side). Swimming pool construction work is ongoing to put in new bleachers, storage for the pool and bathroom renovations. Construction work is expected to last for 4 months.

Triathlon will be in Koror State, at Palau Pacific Resort. Weightlifting and judo competitions will be at the Multi Gym in Meyuns while the wrestling competition will be at the Ngarachamayong Cultural Center.

The Va'a competition will be at the Meyuns Ramp. In the event of strong winds and bad weather, the venue will be relocated to Mgermid Bay.

National and international competitors, as well as other visitors, will require on-site or other local accommodations during the PMG. The schools to be used as athletes' villages are yet to be determined, with needed refurbishments yet to start.

Transportation facilities will be provided by event organizers to shuttle athletes and spectators to and from games' venues. GOC, however, expects that some spectators will likely opt to walk to and between sports facilities and athletes' villages.

Cleaning schedules for both the sporting facilities and the athletes' villages are yet to be developed. The GOC indicated that indoor temperatures will be monitored. As to how, it is unclear.

Behavioural Factors

• Communication and education on Non-Communicable Diseases

At the time of the risk assessment visit, the health service teams, particularly the non-communicable disease (NCD) team, had not planned any communication or education activities related to NCDs for the PMG. Events like the PMG represents a significant opportunity to promote healthy lifestyles to two primary audiences: the athletes and the local population.

To engage the local population, an information booth should be established near the sports venues. This booth can be used to raise awareness about preventing and managing NCDs, while encouraging sustainable lifestyle changes beyond the event. Activities at the booth might include health screenings such as blood pressure monitoring, body mass index (BMI) assessments, and diabetes checks. Additional initiatives could include brief talks, workshops, cooking demonstrations, games, children's activities, and video presentations focusing on NCD prevention. The use of clear signage and the distribution of informative leaflets would further emphasize the role of physical activity in reducing NCD risks. Sharing recipe cards or guides for healthy meals could empower attendees to adopt and maintain healthy eating habits after the event.

For the athletes, pamphlets and posters should be distributed to highlight the benefits of nutritious eating, not only for enhanced athletic performance but also for long-term health.

• Nutrition

While existing Information, Education, and Communication (IEC) materials on nutrition are available in Palau, no specific actions to promote healthy diets have yet been planned for the PMG. Considering the high prevalence of obesity and diseases related to overweight in the region, it is critical to ensure that the mini-games foster a health-conscious environment. Both the athletes and the attending public should have access only to nutritious food and beverages.

For the local population, this means ensuring that all food and drinks sold near the sports venues align with healthy nutrition standards. Vendors should be required to serve meals that include vegetables, incorporate fruits into sweets, and replace sodas with healthier alternatives such as fresh juice, coconut water, or herbal tea. This effort will necessitate the development of nutrition guidelines for vendors. Additionally, event organizers should avoid sponsorships from junk food companies, highlighting instead the value of fresh, local foods by inviting local farmers to sell their produce or by organizing a local market during the event. Drinkable water stations should be made widely available and clearly marked to encourage hydration while reducing plastic bottle usage.

For the athletes, meals provided should meet national nutrition guidelines and be tailored to their specific dietary needs. Dietitians should review and approve all menus to ensure balance and proper portioning. Fresh, locally grown ingredients should be prioritized, requiring collaboration with local vendors and early partnerships with the agricultural department to secure supplies for the athletes' meals.

• Encouraging participation over competition

The Mini Games offer an excellent platform to promote a healthy lifestyle for all participants. Efforts should focus on using language that emphasizes health and well-being rather than purely physical performance. Organizers should collaborate with the education sector, non-government organisations (NGOs), and sports clubs to develop events and programs that extend before and after

the games, encouraging sustained physical activity. Sports clubs could be motivated to reduce registration fees throughout 2025 to attract more participants. Additionally, an awareness campaign on physical activity and healthy living could be launched, featuring a local athlete as an ambassador or role model to inspire the community.

- ## Promoting a tobacco-free environment

Palau's robust tobacco legislation should be strictly enforced during the Mini Games. All event areas, including sports venues, the athletes' village, and schools hosting delegations, should be designated as smoke-free zones. Visible "No Smoking" signs should be placed throughout the venues, and clear communication prior to the event should emphasize that e-cigarettes are also prohibited.

- ## Promoting an alcohol-free environment

Palau's legislation prohibits the sale and marketing of alcohol near sports venues, providing a solid foundation for fostering an alcohol-free environment during the Mini Games. However, identified gaps in alcohol control, as highlighted by the MANA dashboard, present an opportunity to use the event as a platform for advocating for stronger alcohol legislation

- ## Promoting a betel nut-free environment

To promote a betel nut-free environment during the PMG, sports areas should be designated as chew-free zones with clear and friendly signage and positive messaging. A comprehensive campaign could feature a catchy slogan and utilize banners, posters, and social media to promote the initiative. Interactive activities at game venues, such as booths showcasing the health risks of betel nut chewing, creative infographics, and challenges where participants commit to staying betel nut-free, would raise awareness. Successful participants could receive small rewards, such as eco-friendly reusable bottles with the campaign slogan. Highlighting "Chew-Free Athletes" as role models and involving schools through poster or essay competitions would further amplify the message.

- ## Airborne and mosquito-borne diseases

The proximity of people (athletes and visitors) at games venues, while seating, standing or competing close to each other, will provide favourable conditions for the transmission of several communicable diseases, such as influenza-like-illnesses or COVID-19 which have been assessed as high risks on the disease risk assessment.

It is likely that people may not protect themselves against mosquito bites throughout the event, especially if no dengue fever or other mosquito-borne diseases are circulating in the host country, however dengue fever has been assessed as high risk, due to the possible importation of the disease and the presence of mosquito vector in the host country.

Proposed countermeasures include the promotion of preventive behaviours/messages on cough etiquette, hand hygiene, wearing mask, using of mosquito repellents and other methods to protect yourself against mosquito bites. It will also be essential to ensure that hand washing facilities with soap and water are easily accessible at all sports and accommodation venues. During the meeting with the Games Organizing Committee (GOC), it was mentioned that the Committee will approach sponsors to provide goodies in the welcome bag of the athletes. They should be encouraged to procure sanitary products such as hand sanitizers, masks and mosquito repellents.

- ## Food and water safety

Food stands will most likely be available in and around the sports venues for meals and little cravings. The environmental health team mentioned that health inspections will be conducted to ensure food security, however it is unclear if there will be proper areas to eat with enough shade for spectators and hand washing stations close by and it is likely that people may get their food outside and well beyond the game's venues. Gastroenteritis is assessed as a high risk (see details below).

Proposed countermeasure is to encourage everyone (athletes, spectators, visitors) to eat and drink safely: check the general hygiene of the stand, check that dishes are kept hot or cold, eat thoroughly cooked food, wash fruits before eating, hand hygiene before eating, eat quickly after buying a dish or keep the dish/meal in a refrigerated cooler and drink safe water.

- ## Heat

People will very likely be exposed to heat stress conditions, as detailed in the general factors and this may expose them to dehydration. It is not clear if there will be water fountains easily accessible, enough seating and shade areas for the spectators at the game's venues. Spectators will likely crowd outside sports halls to watch matches when the seats inside will be full. This occurred in previous similar events in the region.

It is important to stay in shaded seating areas, remain hydrated by drinking frequently and ensure protection against the sun and heat (wear a hat, sunglasses and use sunscreen).

- ## Sexually transmitted infections

It is likely that event attendees will engage in recreational activities, including unprotected sex. HIV & other sexual transmitted diseases were assessed as high risks for the event. Based on discussions with the Communicable Disease Unit (CDU), sexually transmitted infections (STIs) is an increasing public health problem in the host country. The CDU conducts regular outreach activities to raise awareness and offer screening testing to the local community.

Key actions to consider include strengthening STIs prevention and outreach activities before, during and after the event in the host country, include key preventive messages in a health advice for travellers (for athletes and visitors), ensure that condoms with educational materials are easily accessible and distributed, and offer free STIs screening at the Games venues during the event.

- ## Consulting/reporting if sick

With the euphoric atmosphere of the games and the competitions, it is likely that attendees (athletes & visitors) may not report and consult if they are sick. All attendees (athletes, visitors and the local population) should be encouraged to consult quickly if they sick. Providing a map with information on health centres and emergency contacts can help, as well as engaging delegation medical teams in the surveillance process can also greatly assist with this.

- ## Management of misinformation or rumours

Lots of information will circulate before, during and after the event through different formal and informal communication channels (word of mouth, social media, online platforms) and it is likely that people will spread incorrect information or rumours related to public health and other matters. The impact of these inaccuracies can undermine public health initiatives and create confusion among the event attendees and all the population.

Based on discussions with the MHHS teams and documentation provided to us, monitoring of social media and public discussions and identifying potential misinformation or rumours is conducted by several MHMS staff, but these efforts are not formalized or structured. By developing standard operating procedures or a structured framework, the MHHS can better detect and manage emerging misinformation in real time. Social listening for misinformation should be integrated in an event-based surveillance to optime efforts.

- ## Risk communication and community engagement (RCCE)

There exist a Public Health Emergency Operations Plan (PHEOP), and Risk Communication Plan established in 2013, but it may not fully address current challenges and best practices. The plan needs to be reviewed and updated to incorporate best practices based on the COVID-19 experience, including community engagement and technological advancements.

Existing Protocols, such as the Telephone Tree
While protocols such as the Telephone Tree exist, these are meant to facilitate internal communication in time of emergencies; and are not centralized or integrated into a broader communication system at the MHHS level.

Fragmented Templates and Materials
Based on discussions with MHHS staff, there are existing communication templates and materials, but they are not centrally located or standardized across the MHHS. The lack of a central repository reduces the efficiency and speed with which accurate information can be disseminated to the public.

Coordination of Risk Communication and Community Engagement Efforts
A key countermeasure is to establish a centralized coordination mechanism for risk communication and community engagement efforts. This would involve creating a unified task force or working group or platform that brings together representatives from various MHHS Units/Programmes to ensure consistent messaging, avoid duplication of efforts, and improve overall effectiveness. Terms of Reference and/or Standard operating procedures should be developed to outline how communication efforts are coordinated across different departments and stakeholders.

Centralisation and standardisation of templates and materials
To improve response times and ensure consistency in communication at the MHHS level, it is important to centralize all communication templates and materials in one accessible location. A standardised digital repository should be developed, where templates, guidelines, and resources can be easily accessed and customized for different public health scenarios. This centralised system should be integrated with the updated RCCE plan to ensure alignment with current communication protocols. All these efforts should strengthen the MHHS RCCE efforts for the Mini Games and on the long-term.

- ## Opportunities

To maximize the impact of these initiatives, event organizers should engage the audience in advance by communicating the NCD-friendly measures planned for the games. Feedback forms distributed after the event could help assess the success of these measures and identify areas for improvement. Finally, all communication should emphasize that the PMG is part of a broader mission to promote healthier lifestyles and sustainable practices.

The Mini Games is a great opportunity for Palau MHHS to organise integrated risk communication & community engagement and health promotion activities covering communicable diseases and non-communicable diseases (e.g. public health booth(s) & outreach activities) activities showcasing a

unified public health approach. Tracking survey(s) could be done during outreach activities to check if and how the target audiences (athletes, visitors and/or the local population) have heard about the MHHS messages and/or activities, check their perception of public health risks, respond to their questions and provide them with an opportunity to share comments or suggestions.

The existing collaboration with the Games Organizing Committee, which needs to be maintained, should be used to facilitate dissemination of health advice, alerts and any communication with athletes and delegations. If the committee decides to use a mascot, the latter can be used to promote healthy behaviours and have a role model.

The existing online entry form managed by the MHHS, and the TV screens based at the airport should be used to disseminate health advice and critical information and alerts to travellers (athletes/visitors).

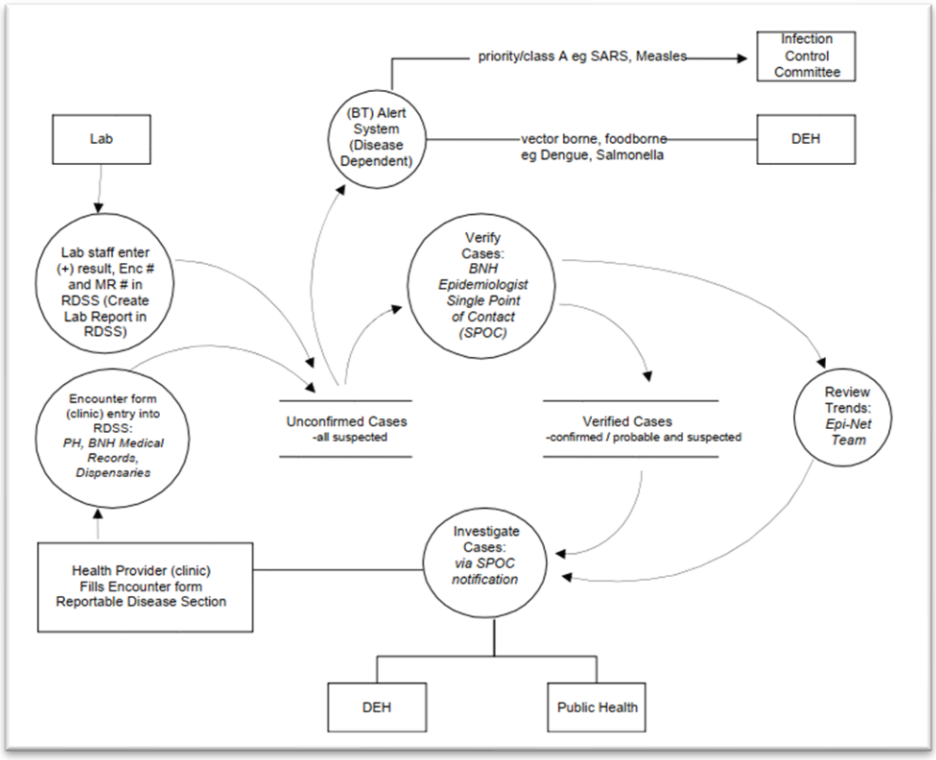
Palau Tourism Website, social media and Office should also be used to disseminate health advice and key messages and information to all visitors. We approached them during our visit, and they were favourable to the approach.

Epidemiological Factors

- ### Surveillance system

In 2005, Palau developed and implemented Reportable Disease Surveillance System (RDSS). In 2011, the syndromic surveillance system was adopted. The two systems allow Palau Ministry of Health and Medical Services to monitor and report infectious diseases of concern. The reporting and alert system is shown in Figure 2.

Figure 2. Palau Reportable Disease Surveillance System Reporting and Alert System



The flow of data and information is well defined and mapped (Figures 3 and 4).

Figure 3. Surveillance Flowchart, Reportable Disease Surveillance System

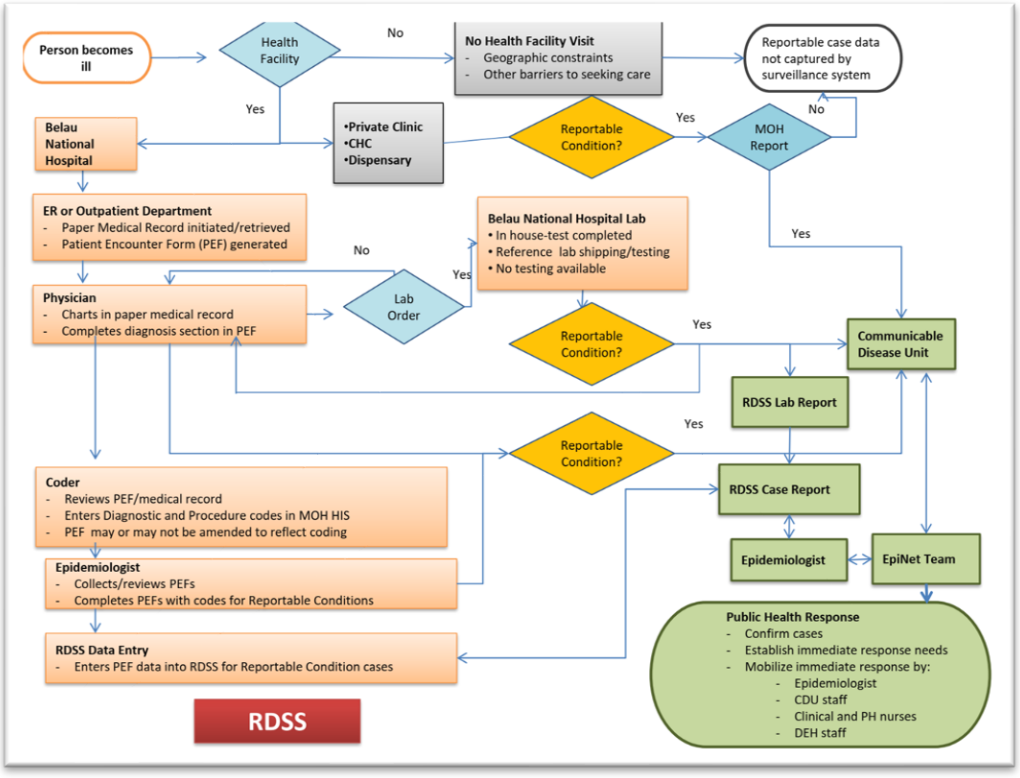
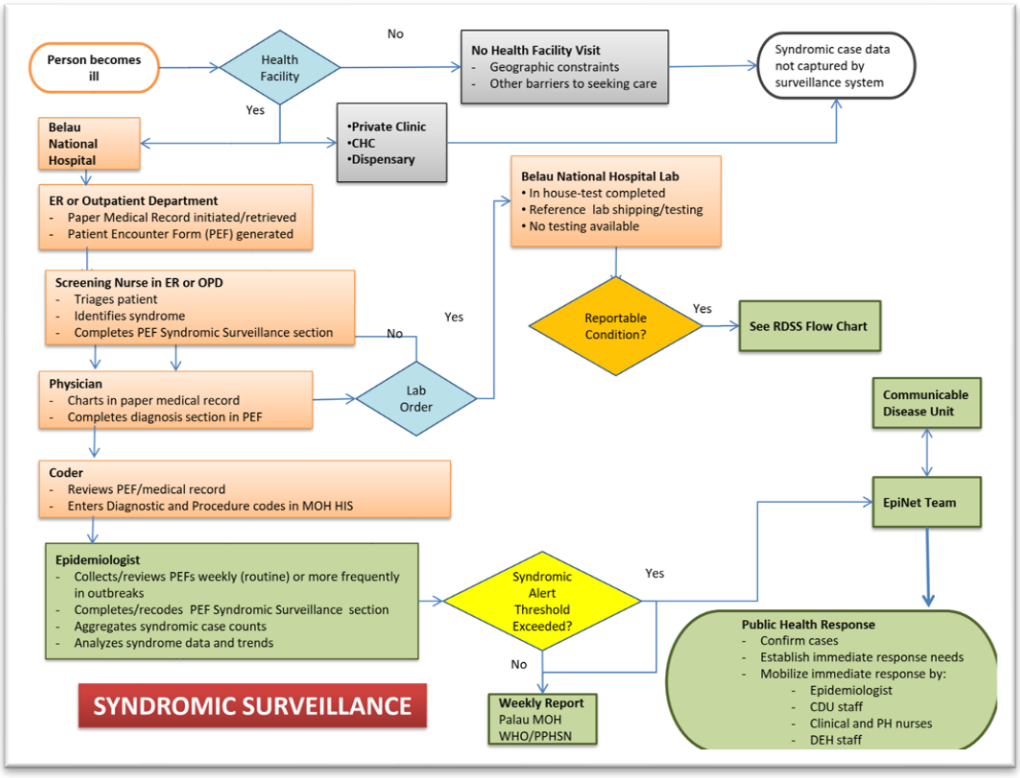


Figure 4. Surveillance Flowchart, Syndromic Surveillance System



There are 6 syndromes and 30 diseases under surveillance and required for immediate reporting. ICD-10 codes and case definitions exists. Written reporting protocol is also available.

There are 5 staff working on surveillance, with varied experience and capacity. Three of the 5 staff have completed the Data for Decision-Making course (Postgraduate Certificate in Field Epidemiology [PGCFE] course of the Strengthening Health Interventions in the Pacific (SHIP-DDM programme).

Standard tool for recording and reporting is used. A data tally sheet is used for daily data collection. Collected data is entered into MS Excel. Epidemiology report is prepared using MS word. About 1,500 case records are processed per week – roughly 215 records per day.

- ## Syndrome and disease surveillance

Review of surveillance data for the period from 2022 until 2024 showed that gastroenteritis and influenza-like illnesses are among the greatest number of cases reported (Figures 5 and 6).

Figure 5. Palau Syndromic Surveillance, 2022-2023

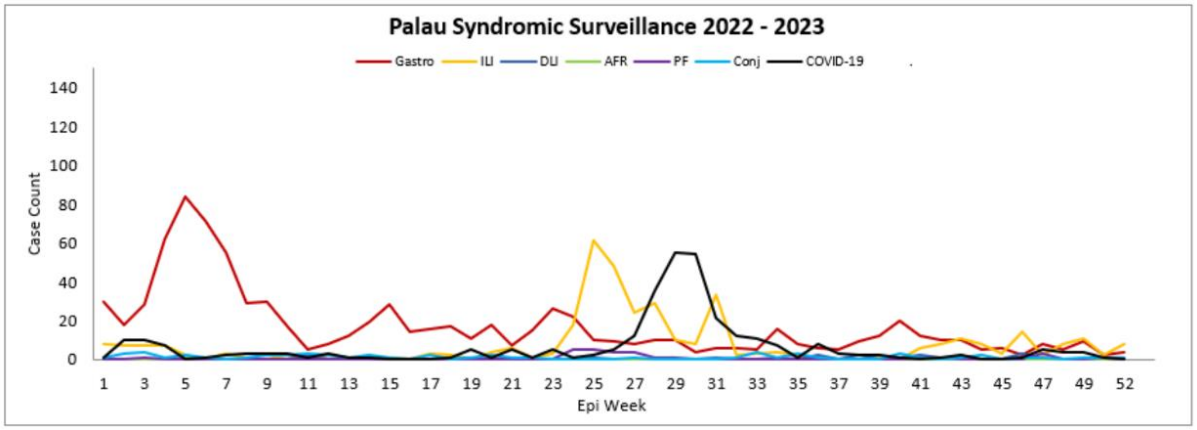
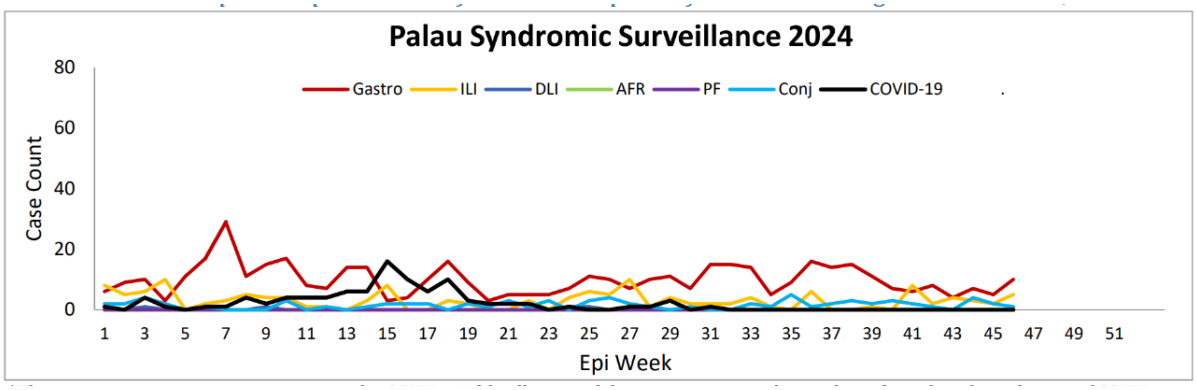


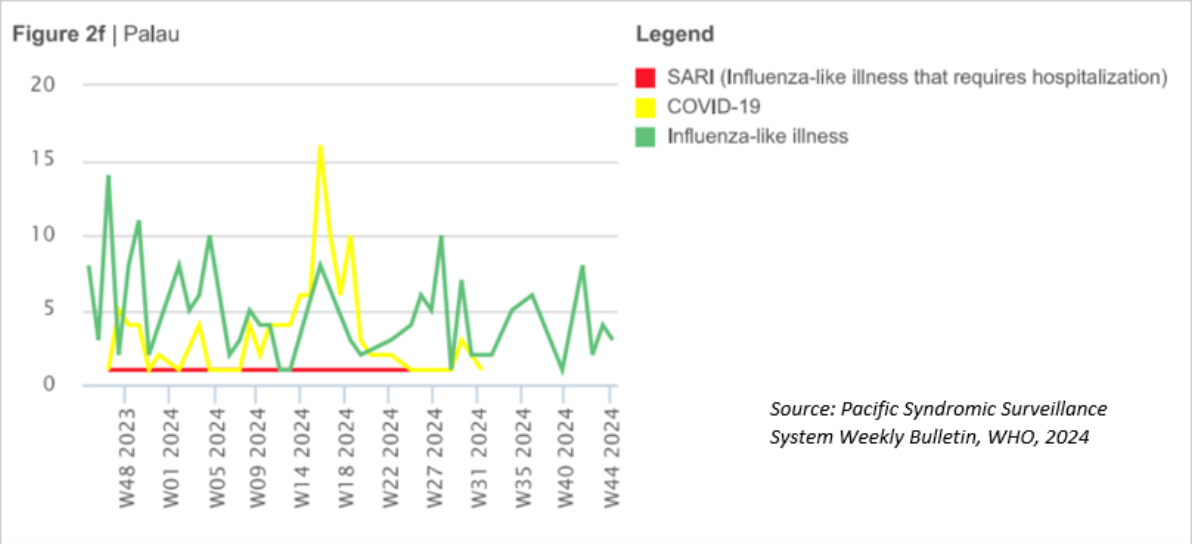
Figure 6. Palau Syndromic Surveillance, 2022-2023



○ Influenza and other respiratory virus infections

Influenza cases occur throughout the year in Palau (Figures 5 and 6). Higher numbers of ILI cases were reported in the months of January, June and November (Figure 7).

Figure 7. Pacific Syndromic Surveillance System Weekly Bulletin, WHO, W44 2024



○ Food- and Water-borne diarrhoeal diseases

Food and water-borne diarrhoeal diseases were reported by Palau MHHS on the Pacific Syndromic Surveillance System (PSSS) (Figure 8). There has been a limited number of incidents in recent years. However, past events have shown that MHHS has the capacity to identify and manage food and water safety risks. Figure 9 shows a memorandum issued by MHHS in a recent water safety incident in September 2024. In the event of a food and water incident occurring at national scale, the National Emergency Committee (NEC) and the National Emergency Management Office (NEMO) are activated.

Figure 8. Pacific Syndromic Surveillance System Weekly Bulletin, WHO, W44 2024

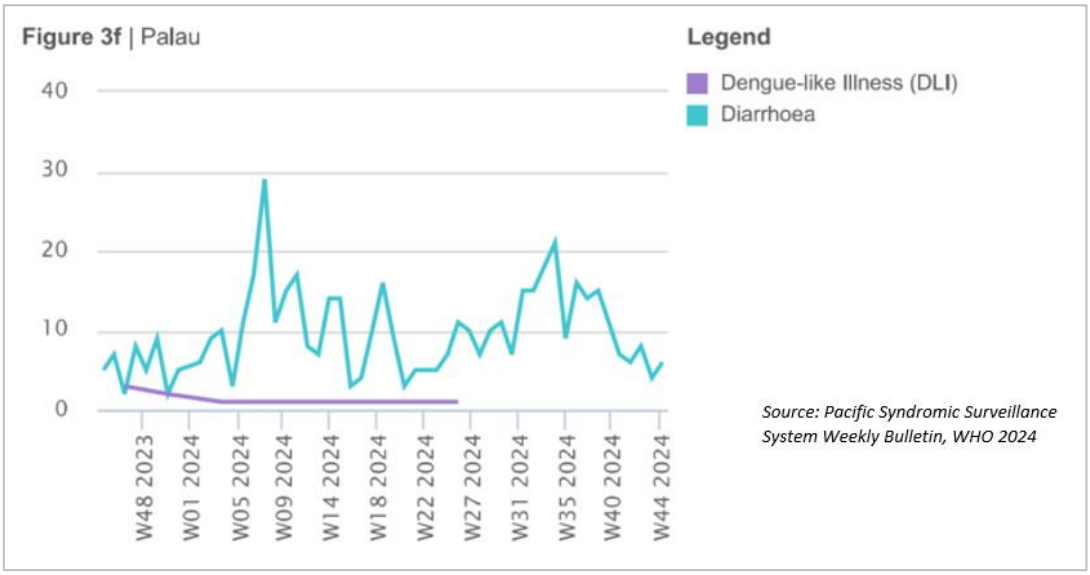
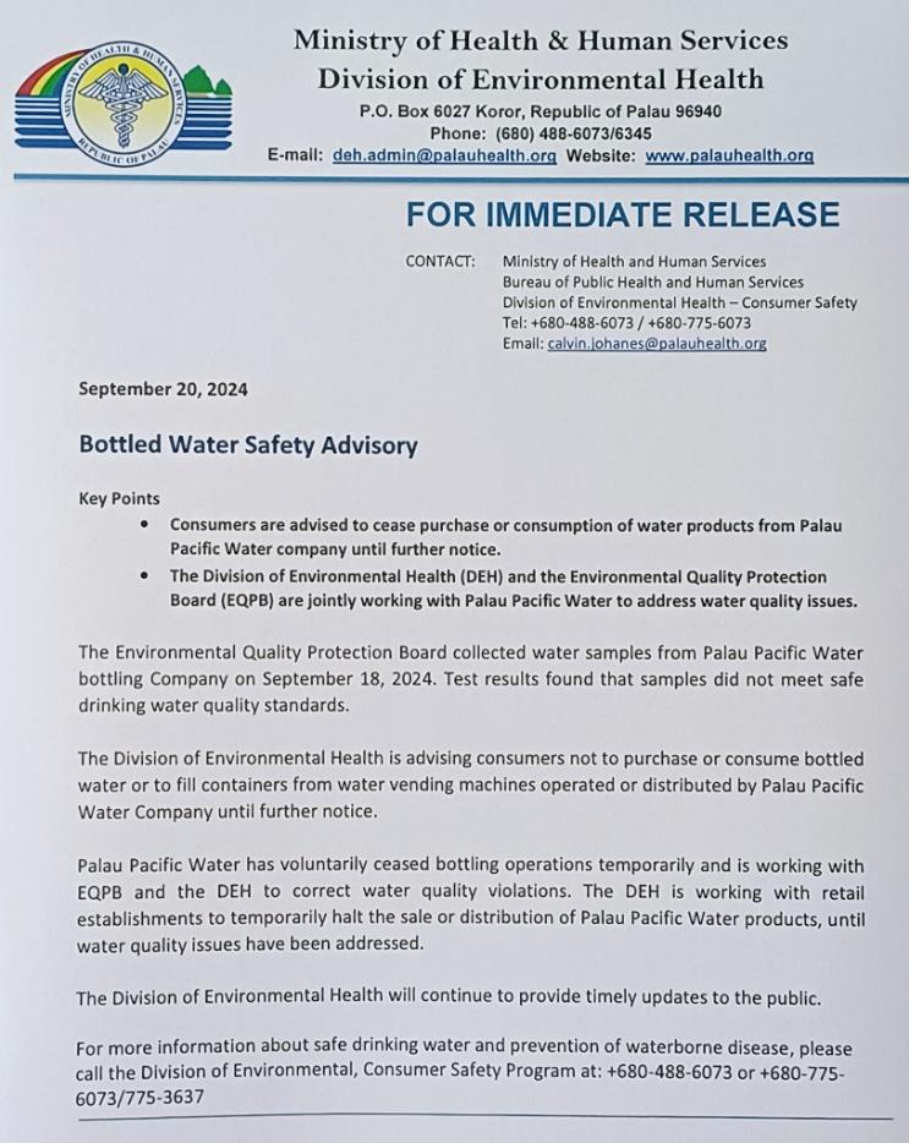


Figure 9. Health Advisory on Water Safety Incident, Ministry of Health and Human Services, September 2024



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September 20, 2024

Bottled Water Safety Advisory

Key Points

- **Consumers are advised to cease purchase or consumption of water products from Palau Pacific Water company until further notice.**
- **The Division of Environmental Health (DEH) and the Environmental Quality Protection Board (EQPB) are jointly working with Palau Pacific Water to address water quality issues.**

The Environmental Quality Protection Board collected water samples from Palau Pacific Water bottling Company on September 18, 2024. Test results found that samples did not meet safe drinking water quality standards.

The Division of Environmental Health is advising consumers not to purchase or consume bottled water or to fill containers from water vending machines operated or distributed by Palau Pacific Water Company until further notice.

Palau Pacific Water has voluntarily ceased bottling operations temporarily and is working with EQPB and the DEH to correct water quality violations. The DEH is working with retail establishments to temporarily halt the sale or distribution of Palau Pacific Water products, until water quality issues have been addressed.

The Division of Environmental Health will continue to provide timely updates to the public.

For more information about safe drinking water and prevention of waterborne disease, please call the Division of Environmental, Consumer Safety Program at: +680-488-6073 or +680-775-6073/775-3637

Vector-borne diseases

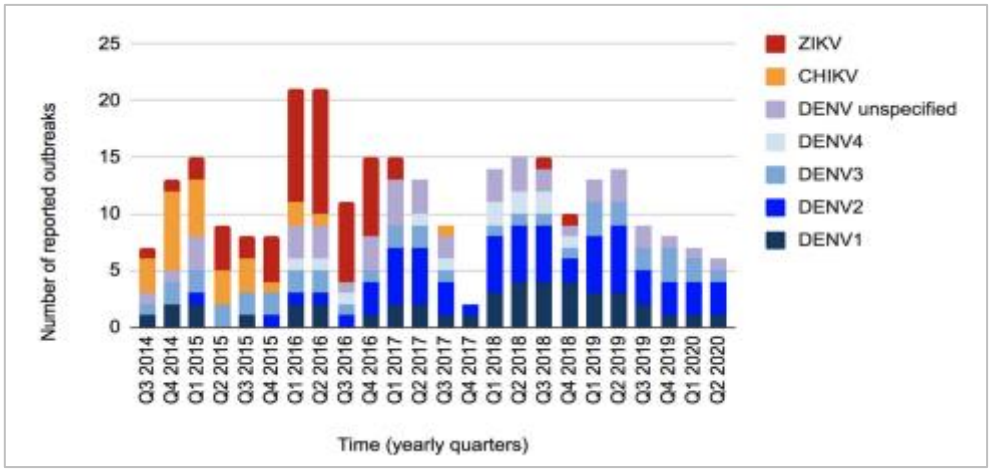
The vector-borne diseases (VBDs) of significance to the Pacific region include dengue, malaria, lymphatic filariasis, zika virus and chikungunya, all of which are transmitted by mosquitoes. The distribution or presence of VBDs in PICTs is very much driven by the presence or absence of the vectors and the pathogen. Table 4 shows the VBD and major vector distribution in the Pacific.

Table 4. Vector-borne Diseases and Major Vector Distribution in the Pacific Region
Source: Proceedings of the Workshop on Climate Change and Vector-Borne Diseases, WHO. 2015.

Disease	Country/Region	PIC Vectors
1. Dengue	Pacific wide	*Ae. aegypti, Ae. albopictus, Ae. polynesiensis* & numerous other species in the *scutellaris* group
2. Chikungunya	New Caledonia, Tonga, FSM	*Ae. aegypti, Ae. albopictus, Ae. polynesiensis*
3. Zika virus	FSM, French Polynesia, New Caledonia, Cook Islands	*Ae. hensilli, Ae, aegypti*
4. Lymphatic filariasis	Pacific wide (except in 6 countries)	*Cx, quinquefasciatus, An.farauti, Ae. albopictus*
5. Malaria	Solomon Islands, Vanuatu	*An. farauti, An. hinesorum, An. punctulatus*
6. Epidemic Polyarthritis (Ross River virus)	Fiji, Cook Islands, New Caledonia, Tonga, Samoa	*Ae. vigilax, Cx. annulirostris, Ae. polynesiensis*
7. Japanese Encephalitis	Micronesia (Guam), Nth Mariana	*Cx. tritaeniorhynchus, Cx. annulirostris, Cx. sitiens*

A study published in 2022 reported 104 unique arboviral outbreaks between 2014 to 2020, including 72 dengue outbreaks affecting 19 PICTs, 14 chikungunya outbreaks affecting 11 PICTs, and 18 Zika outbreaks affecting 14 PICTs. Figure 10 summarizes their temporal distribution and Figure 12 depicts the timeline of reported dengue outbreaks.

Figure 10. Number and temporal distribution of arboviral outbreaks, by virus, reported in the Pacific, October 2014 – June 2020
Source: Arboviral disease outbreaks in the Pacific Islands countries and areas, 2014 to 2020: A systematic literature and document review

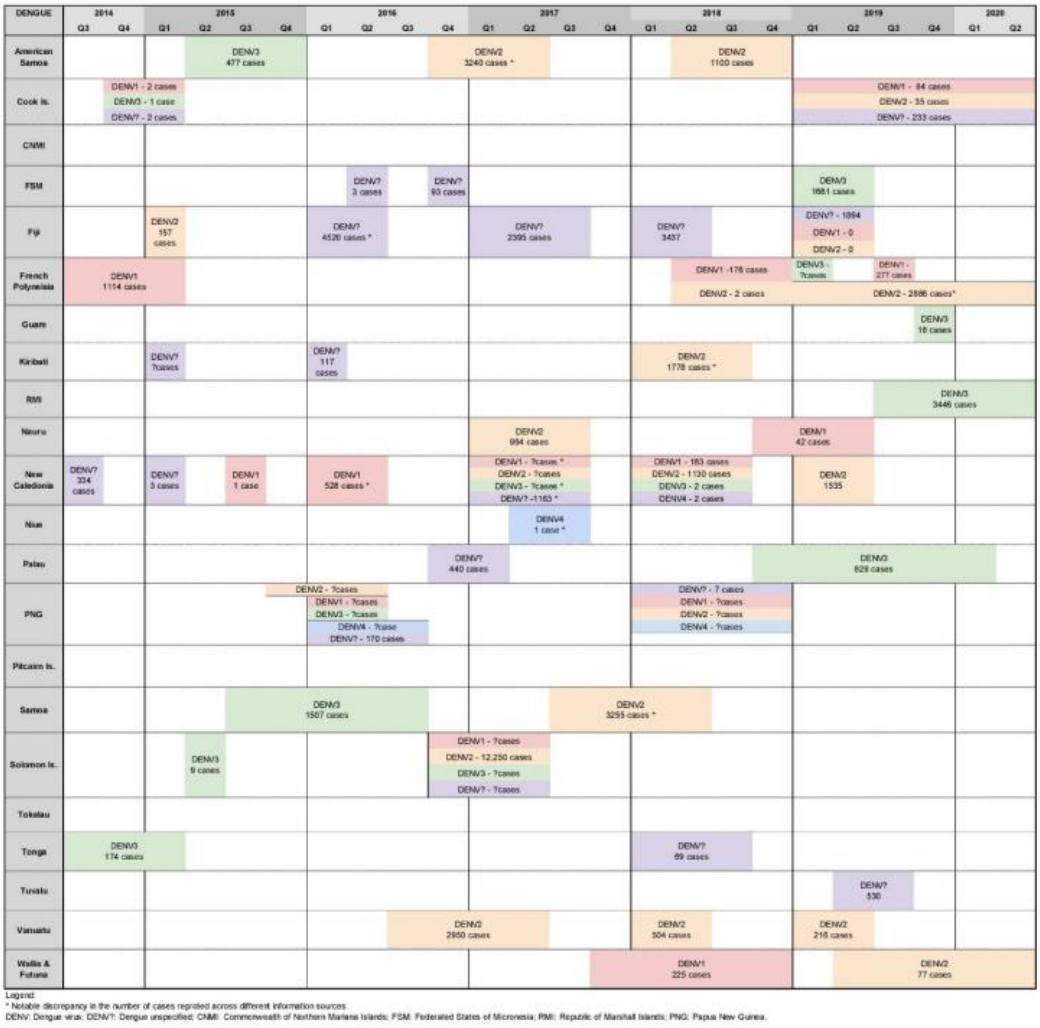


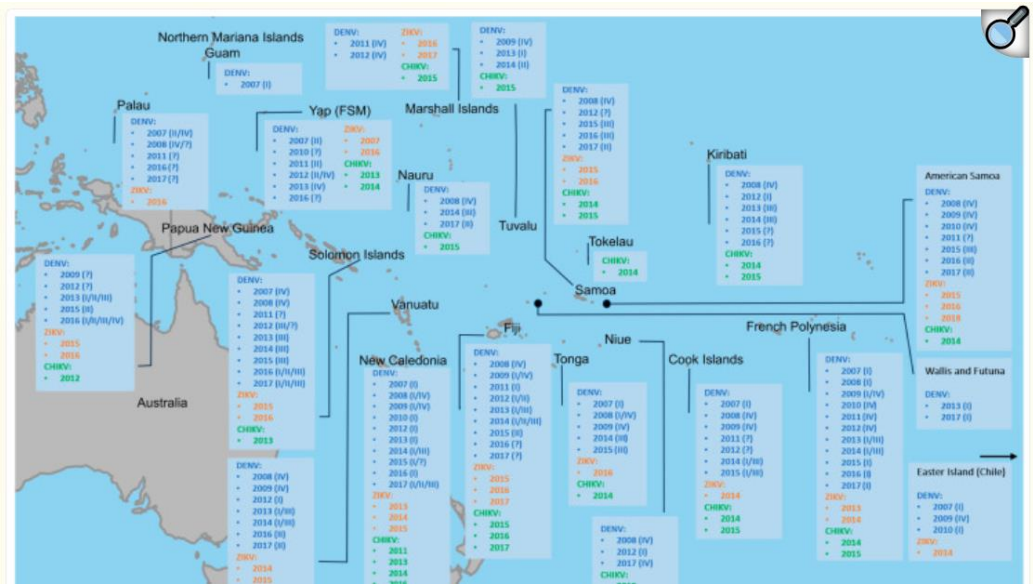
Although the reported number of dengue cases in Palau is less (Figs 5 and 6), dengue transmission in the Pacific occurs all year round. There is considerable variation in the dengue risk in the Pacific,

depending on the geographic location and climatic zone. Almost all (19 out of 22) PICTs reported at least one dengue outbreak event (Figure 11).

Figure 11. Timeline of reported dengue outbreaks, Pacific Region, October 2014 – June 2020

Source: [Arboviral disease outbreaks in the Pacific Islands countries and areas, 2014 to 2020: A systematic literature and document review]





○ Vaccine-preventable diseases

The National Verification Committee (NVC), established in January 2012, determined that there is no transmission of endemic measles virus in the PICTs (Figure 12) in 2023. However, measles continues to circulate in some PICTs in the past years with reported outbreaks in 2019 and 2020 (Table 5) and elsewhere in the world. There is a risk that measles infected travellers may enter Palau during the Pacific Mini Games.

Figure 12. Status of verification on measles and rubella elimination in the Western Pacific Region by country, 2012-2023

Source: Measles and Rubella elimination in the Western pacific Region in 2013-2022

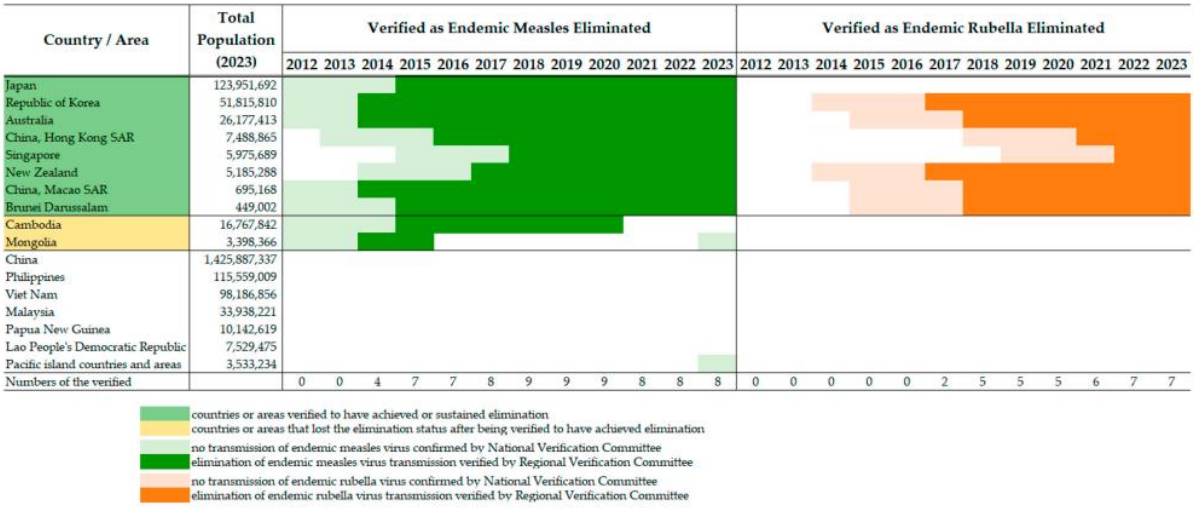


Table 5. Confirmed cases and incidence of measles, Pacific Region, 2012-2023

Source: Measles and Rubella elimination in the Western pacific Region in 2013-2022

Country / Area (PIC)	Total Population (2023)	Measles																							
		Cases (confirmed)												Incidence (confirmed cases per million population)											
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Fiji	929,766	0	0	1	1	5	1	0	31	3	2	0	0	0.0	0.0	1.1	1.1	5.4	1.1	0.0	33.8	3.3	2.2	0.0	0.0
Solomon Islands	724,273	0	0	15	0	1	0	0	0	0	0	0	0	0.0	0.0	25.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vanuatu	326,740	0	0	5	19	0	0	0	0	0	0	0	0	0.0	0.0	18.5	68.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
French Polynesia	306,279	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Caledonia	289,950	0	0	0	1	0	1	0	0	0	0	0	0	0.0	0.0	0.0	3.5	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0
Samoa	222,382	0	0	0	0	0	0	0	5,689	18	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26,846.9	83.7	0.0	0.0	0.0
Guam	171,774	0	0	1	0	0	0	0	0	0	0	0	0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kiribati	131,232	0	0	0	0	0	0	0	0	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.0	0.0	0.0
Micronesia (Fed. States of)	114,164	0	0	257	0	0	0	0	0	0	0	0	0	0.0	0.0	2,357.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tonga	106,858	0	0	0	0	0	0	0	608	51	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5,793.2	484.5	0.0	0.0	0.0
Northern Mariana Islands	49,551	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
American Samoa	44,273	0	0	0	0	0	0	0	31	2	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	655.1	43.3	0.0	0.0	0.0
Marshall Islands	41,569	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Palau	18,055	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cook Islands	17,011	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nauru	12,668	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wallis and Futuna Islands	11,572	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tuvalu	11,312	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Niue	1,934	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tokelau	1,871	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

○ Other health risks

Exacerbation of underlying medical conditions due to smoking, betel nut chewing, and unhealthy food intake is very likely to happen with severe impact. These conditions include heart diseases, diabetes, asthma, mouth ulcers, gum disease, etc.

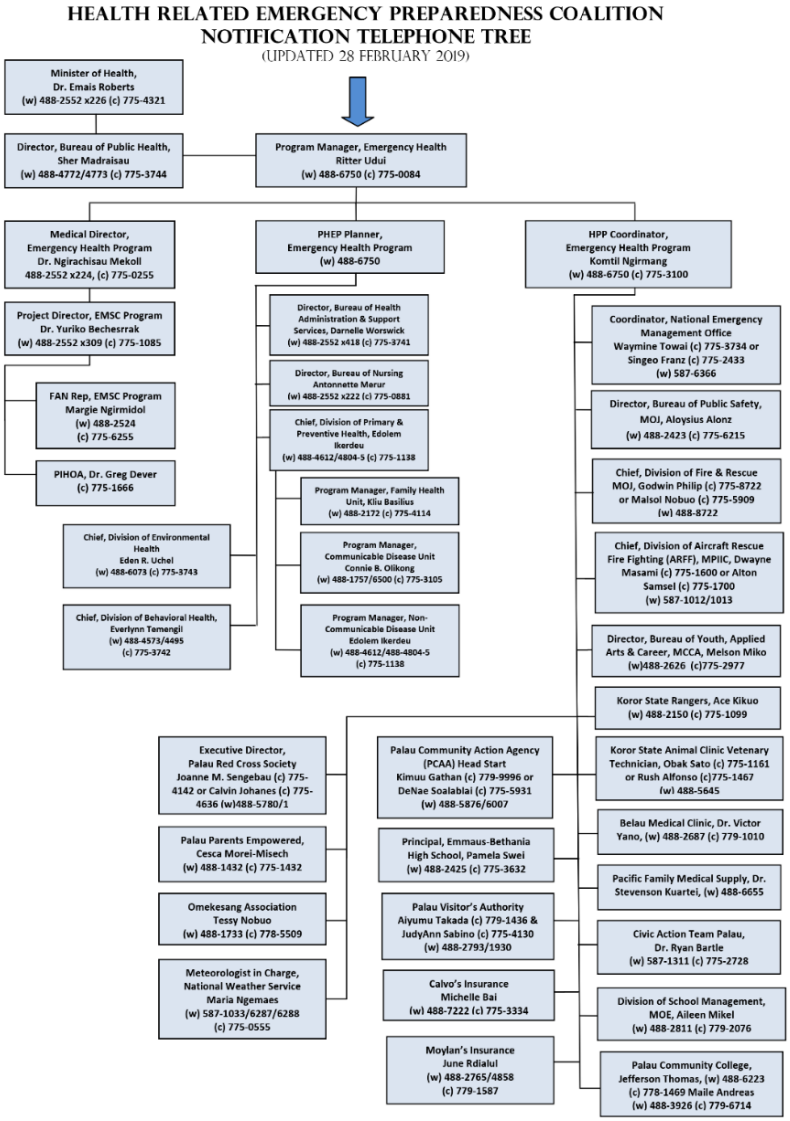
Alcohol-related illness and injuries, and sports-related injuries are very likely to happen.

- ## Response

There is an established Health Related Emergency Preparedness Coalition, created by virtue of President's Executive Order No. 385 issued in December 2015, whose primary function is to provide advice on health-related emergency mitigation, preparedness, response and recovery services. The Coalition works closely with the National Emergency Committee (NEC)[5] and the National Emergency Management Office (NEMO)[6] in facilitating joint development of capabilities. The Ministry of Health serves as the lead agency for the Coalition.

When a disaster occurs, Belau National Hospital Emergency Room is notified through a phone call. The attending physician who received the call automatically assumes the role of Incident Commander who will then notify the Medical Records Technician who will in turn activate the Emergency Telephone Tree (Figure 13). The Emergency Operations Response Plan is then activated, Incident Command System stood up, and a team is mobilised to respond to the incident.

Figure 13. Health Related Emergency Preparedness Coalition Notification Telephone Tree

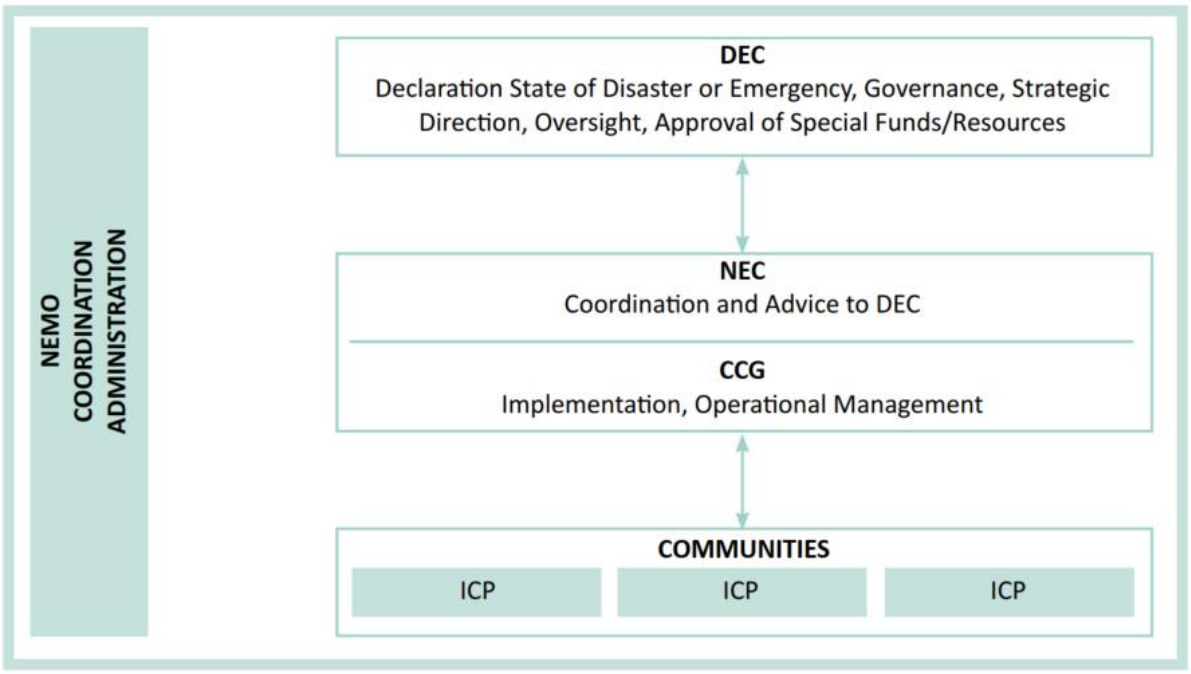


[5] National Emergency Committee is the sole authority on emergency response in the Republic of Palau.
[6] National Emergency Management Office is involved in all aspects of disaster management for the nation and acts with the counsel of and in concert with the National Emergency Committee.

In the event where a national disaster is declared, the NEC takes over.

There exists a National Disaster Risk Management Framework (NDRMF) given full effect by Executive Order No. 397. The Framework outlines the institutional arrangements enabling effective coordination and collaboration in preparing for, responding to, and recovering from the impact of any hazards in Palau. It provides a tiered level of response to emergencies and disaster management. The Disaster Executive Council (DEC) is the highest tier, followed by NEC in the second tier, then the Incident Command Post (ICP) which represents on-site management of emergency or disaster events. This structure and the flow of communication during a national disaster or emergency is depicted in Figure 14 below.

Figure 14: National Disaster and Emergency Management Structure



Environmental Factors

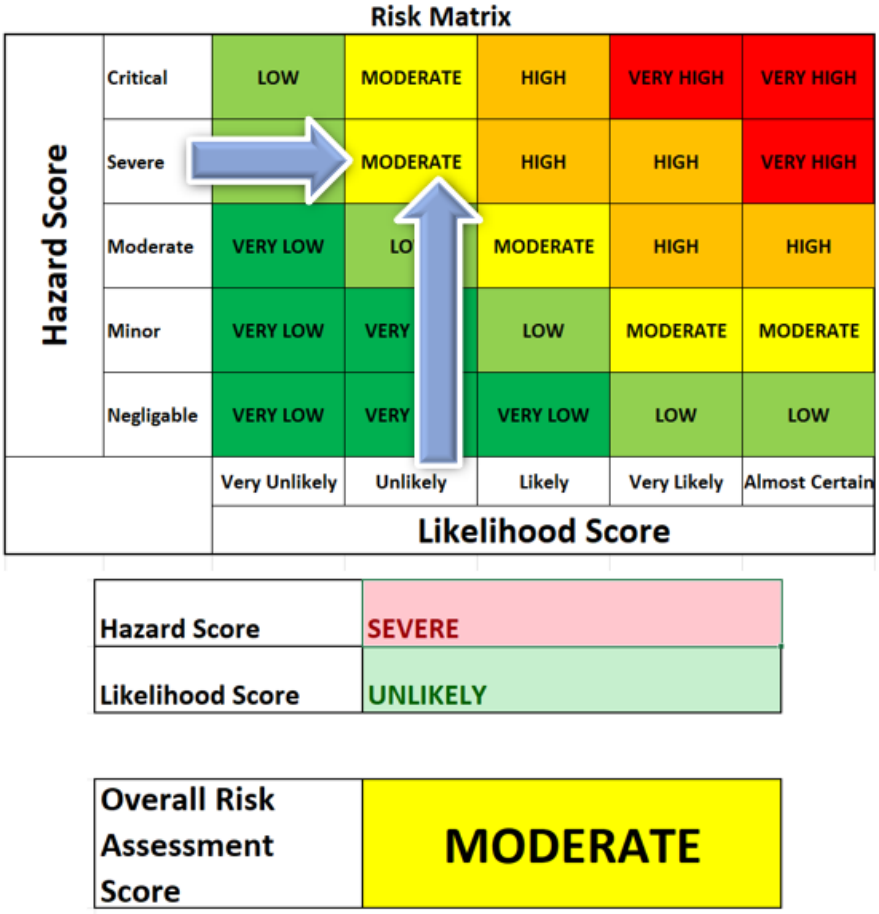
Palau has developed comprehensive environmental health regulations and guidelines on proper food handling. The Division of Environmental Health (DEH) is responsible for food safety, relying on a pool of well-trained staff from the MHHS to enforce it.

Laboratory tests can be done in Palau for a range of food-related diseases, and reference laboratories outside the country can be accessed for the detection of contaminants or organisms that cannot be diagnosed in-country. Environmental Health Inspectors carry out food safety inspections in grocery stores, catering facilities and restaurants using standard tool for inspection.

Risk assessment

A moderate overall risk was determined by combining the identified hazards and their likelihood of occurrence (Figure 15). Hazards included epidemiological concerns, non-infectious health threats (e.g., NCDs, alcohol substance use, smoking, injuries, etc.), environmental concerns (e.g., overheating, pest and vector control, sanitation and waste), food safety and clean water concerns. Likelihood assessment took into consideration the frequencies and seasonality of the hazards as well as the preparation and mitigation measures currently in place.

Figure 15: Risk Assessment, Palau, November 2024



Impact assessment

The impact of the hazards, if the hazards occur, to Palau health system was likewise assessed by considering the Palau 2023 International Health Regulations (IHR) State Party Annual Report (SPAR). Taking into consideration the 22 SPAR indicators vis-à-vis the corresponding indicator scores, a SPAR score of 57 (moderate capacity) was determined.

Healthcare capacity score was also estimated across 8 key technical areas (laboratory, surveillance, health emergency management, health service provision, risk communication and community

engagement, points of entry and border health, food safety, and mass casualty management). An estimated capacity score of 65 (high capacity) was determined.

Combining the 2 scores together resulted to a moderate health system capacity rate (Figure 16).

Figure 16: Impact Assessment, Palau, November 2024

Category	Impact or Country Capacity Question	Answer or Score
States Parties Self-Assessment Annual Reporting (SPAR)	Has the country completed a self-assessment annual report using the States Parties Self-Assessment Annual Reporting (SPAR) tool? *If YES, please enter the most recent available country scores for the following SPAR indicators (available to download.*	
	C4.1 Specimen referral and transport system	80
	C4.2. Implementation of a laboratory biosafety and biosecurity regime	60
	C4.3. Laboratory quality system	60
	C4.4. Laboratory testing capacity modalities	60
	C4.5. Effective national diagnostic network	40
	C5.1. Early warning surveillance function	80
	C5.2. Event management	60
	C7.1. Planning for health emergencies	80
	C7.2. Management of health emergency response	100
	C7.3. Emergency logistic and supply chain management	80
	C8.1. Case management	80
	C8.2. Utilization of health services	40
	C8.3. Continuity of essential health services (EHS)	80
	C10.1. RCCE system for emergencies	80
	C10.2. Risk communication	80
	C10.3. Community engagement	60
	C11.1. Core capacity requirements at all times for PoEs	40
	C11.2. Public health response at PoEs	40
	C11.3. Risk-based approach to international travel-related measures	80
	C13.1 Multisectoral collaboration mechanism for food safety events	60
	C14.1. Resources for detection and alert (chemical events)	40
	C15.1. Capacity and resources (radiation emergencies)	40
	SPAR Score	**57**
	SPAR Capacity Result	**Moderate Capacity**
Estimation of Capacities	*Please answer the below questions to provide a rough estimation of the local healthcare capacities. Answer each statement with a High, Medium or Low option. If you do not know - or cannot estimate - what the capacity level is, asnwer DON'T KNOW. To the best of your judgment, please rate the following capacities as HIGH (robust capacity will be in place at the gathering), MEDIUM (middling capacity will be in place at the gathering) or LOW (weak or no capacity will be in place at the gathering).*	
	Laboratory capacities, including specimen referral and transport systems; laboratory biosafety and biosecurity regimes; quality systems; testing modalities; and a national diagnostic network.	High
	Surveillance capacities, including early warning systems and verification, investigation, analysis, and dissemination of information.	High
	Health emergency management capacities, including planning for health emergencies; management of health emergency response; and emergency logistic and supply chain management.	High
	Health services provision capacities, including case management, health service utilization, and continuity of essential health services.	Medium
	Risk communication and community engagement (RCCE) capacities, including RCCE systems for emergencies; mechanisms for public communication and/or media relations (including infodemics); and guidelines/SOPs for implementing community engagement activities at national and subnational levels.	Medium
	Point of entry (PoE) and border health capacities at airports, ports, and ground crossings; public health emergency contingency plans for PoEs; and a national multisectoral process with mechanisms to determine the adoption of international travel-related measures, in a risk-based manner.	Medium
	Food safety capacities, including a multisectoral collaboration mechanism for addressing foodborne outbreaks.	High
	Mass casualty management capacity which has been exercised (drill or real-life event).	Medium
	Estimated Capacity Score	65
	Estimated Capacity Result	**High Capacity**
Health System Capacity	**Moderate Capacity**	

Opportunities for Improvement and Countermeasures

Listed below are opportunities for improvement and possible countermeasures for Palau MHHS to consider in preparing for and in the implementation of enhanced surveillance for the Games:

- Venue factors
  - Ensure that games venues and athlete's villages comply with local hazard guidelines.
  - Develop schedule for cleaning and waste disposal. Clearly defined roles of all stakeholders as well as areas of responsibility should be spelled out.
  - Define conditions for entry into games venues taking into consideration legal occupancy limits of the areas without overcrowding.

- Set-up a mechanism for weather and temperature monitoring to ensure safety and comfort of athletes and spectators. Provision of sufficient shaded seating areas, where possible, should be considered.
- Pre-identify mass casualty evacuation site/s. Rapid response is key during mass casualty. Knowing the location in advance will reduce delays in directing and transporting casualties, ensuring timely medical attention. It will also help facilitate efficient resource allocation and better coordination.
- Consider pre-positioning ambulance and emergency transport facility in games venues and/or strategic locations for efficient movement of patients and for rapid medical response.

Behavioural factors

- Raise awareness about preventing and managing NCDs, while encouraging sustainable lifestyle changes beyond the Games event.
- Strictly enforce Palau's robust tobacco legislation during the Games, designating sports venues and athletes' villages as "smoke-free" zones.
- Promote a betel nut-free environment during the Games.
- Promote preventive behaviours and key health advisories in collaboration with other stakeholders: cough etiquette, hand hygiene, wearing mask, proper condom use, protection from heat and sun, use of mosquito repellents and other methods to protect against mosquito bites, and consulting/reporting if sick.
- Ensure easy access to hand washing facilities with soap and water at all sports and accommodation venues.
- STIs: ensure that condoms with accompanying information education materials are easily accessible and distributed to all event attendees prior to and during the event (e.g. welcome bag, games venues, games villages, etc.); where resources allow, consider provision of free STI screening at the Games venues during the event.
- Organise integrated and unified public health approach on risk communication and community engagement and health promotion activities covering communicable diseases and non-communicable diseases (e.g. public health booth(s) and outreach activities).
- Leverage the use of existing online entry form managed by the MHHS, the TV screens based at the airport, and the Palau Tourism Website (and Office) to disseminate health advice and critical information and alerts to travellers (athletes/visitors).
- Management of misinformation and/or rumours.

Epidemiological factors

- Implement multi-source surveillance system to include the following:
  - Priority syndromes and selected diseases
  - Injury surveillance
  - Laboratory surveillance
  - Environmental information

        - Unusual events/event-based surveillance (EBS) and social listening
    - Consider additional sentinel site(s) strategically situated where the games will be held and where the athletes will be housed. Data flow from the various sentinel sites should be streamlined for efficiency. Considering updating data flow chart and standard operating procedures (SOP) for reporting considering the enhancements on the surveillance system.
    - Harmonize surveillance reporting with simplified digital tools. A tool/system with an application programming interface which can allow pushing of data and information into a data visualisation tool, preferably free (or minimal cost) for sustainability, and accessible offline (e.g., Kobotoolbox). Consider the use of data visualisation tool (e.g., PowerBI) and use of an online tool for EBS and social listening. (*Note: SPC is in the process of testing the use of YouScan by Research for Purpose, which Palau can leverage on for its enhanced surveillance needs.*)
    - Strengthen capacity of Palau health service providers in account of changes for an enhanced surveillance system.

- Environmental factors
    - Define and agree on key indicators for monitoring and reporting, and for inclusion in the enhanced multi-source surveillance system.
    - Consider streamlining and updating tools for monitoring food and water safety, and for environmental indicators.
    - Ensure sufficiency of handwash facilities in dining halls for the prevention of food-borne illnesses, reduction of cross-contamination, and prevention of outbreaks.

Next steps

The risk assessment highlighted opportunities for improvement which can form part of the SPC support packages in the implementation of enhanced mass gathering surveillance during the 12th Pacific Mini Games in Koror, Palau. The SPC support packages will be structured in 3 stages, implemented at various time points before, during and after the Games (Figure 17), done as part of an established cadence:

1. Stage One: Preparation

    The first step of the preparation stage, after completing the surveillance system and disease risk assessment, is to discuss the SPC support packages during the Games and formalise an agreement which may include support for the enhanced surveillance, including risk communication and health promotion, among others. A letter of agreement defining and outlining the scope of work with timelines, proposed roles and resources can be executed between Palau MHHS and SPC Public Health Division.

    Development and/or updating of surveillance work plan, enhancement in policy and institutional environment (including updating of standard case definitions, protocols, algorithms, etc.), development of surveillance tools (e.g., data collection forms, reporting

forms/systems, etc.), and development of risk communication and health promotion plan and materials, will form part of the preparatory stage.

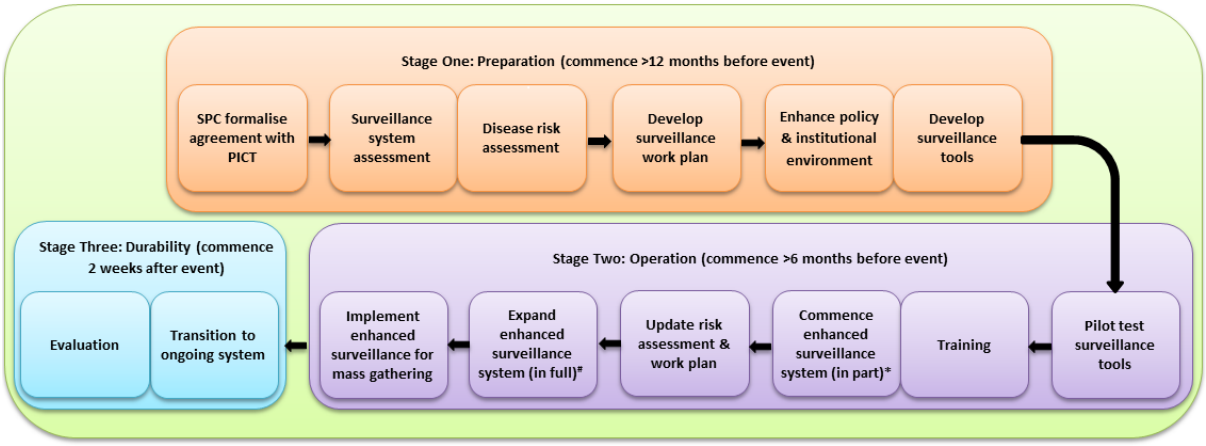
2. Stage Two: Operation

   Surveillance tools, forms and systems developed will go through a period of pilot testing using dummy data. Training in mass gathering surveillance, on the use of surveillance tools, on reporting and in outbreak response will be conducted. This will be followed by phased implementation of enhanced surveillance system, alongside follow-through periodic risk assessments and updating of work plans. Risk communication and health promotion materials developed for the event will be pre-tested and revised/adapted. Translation and printing will be supported as needed. Training on RCCE will be done.

3. Stage Three: Durability

   It is important to note that the surveillance system will need to transition back to the original system with, hopefully, incorporation of new tools that were developed for the enhanced surveillance system. The final decision on the way forward with regards to how the Palau surveillance system will function will be by the MHHS authorities, guided by the results of an after-action review to evaluate the effect and sustainability of new tools and systems.

Figure 17: SPC Approach for Enhanced Surveillance, Mass Gathering Events



*Expand to all new sentinel sites; continue with weekly reporting; commence use of web-based data entry and analysis
#Change from weekly reporting to daily reporting


Pacific
Community
Communauté
du Pacifique