

# Multi-source enhanced surveillance for mass gathering events: the Pacific experience

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# Outline

About Us - The Pacific Community



Sustainable Pacific development through science, knowledge and innovation



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Where we work - The Pacific Region



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Pacific Public Health Surveillance Network



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Lessons identified

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Our approach for mass gathering events



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# The Pacific Community

*Sustainable pacific development through science, knowledge and innovation*



## SPC Members

Owned and governed by 27 member countries and territories

### SPC's Divisions



Climate Change and Environmental Sustainability



Educational Quality and Assessment



Fisheries, Aquaculture & Marine Ecosystems



Geoscience, Energy and Maritime



Human Rights and Social Development



Land Resources



Public Health



Statistics for Development



Integrated Programmes

# The Pacific Region

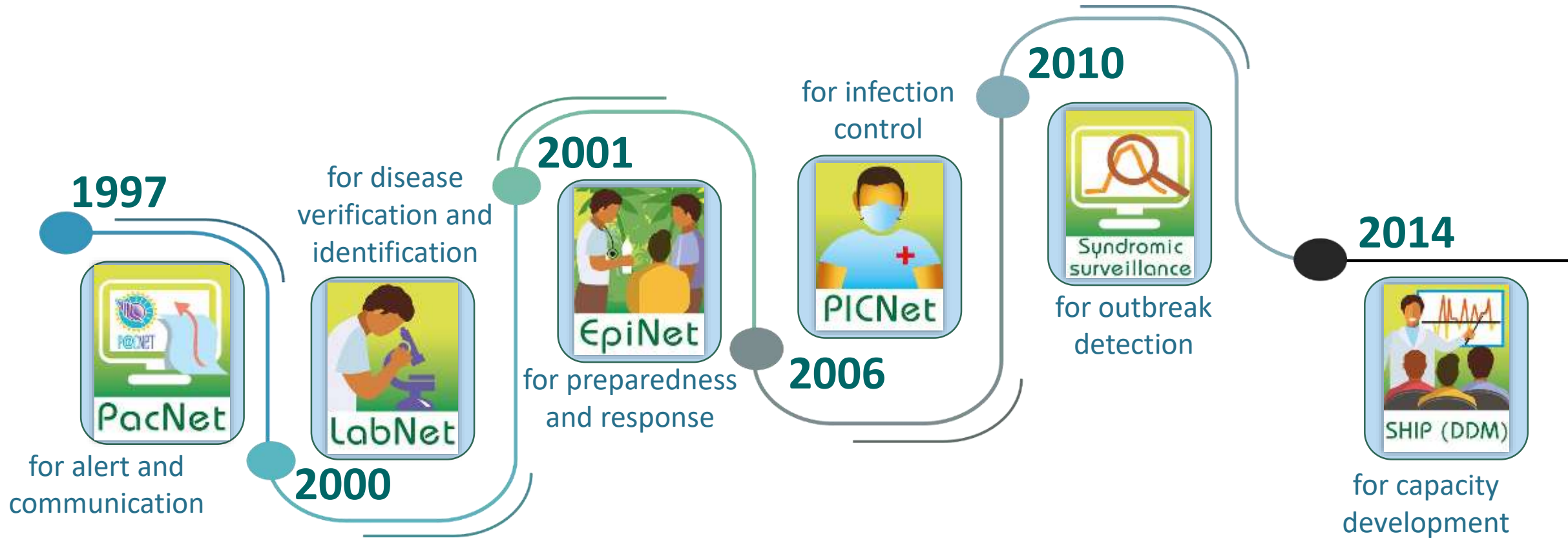
- 22 island countries and territories
- Population: 12.8 M (2022)
- 15% of the globe's surface
- Limited resources
  - Health staff with multiple responsibilities
  - Diverse priorities
  - Limited funding







# Regional collaboration and progressive development: the foundation and advances of Pacific Public Health Surveillance Network (PPHSN)







# Mass gathering events in the Pacific

Athletics: Pacific Games; Pacific Mini-Games; Pacific Micro-Games







# FESTIVAL OF CIFIC ARTS

Hosted In Guam • May 22–June 4, 2016



# of Pacific Arts

July 1st -14th, 2012

# Solomon Islands



Mass gathering events in the Pacific  
Social and cultural: Festival of Pacific Arts; Music Festival



# Mass gathering events in the Pacific

Visit by dignitaries

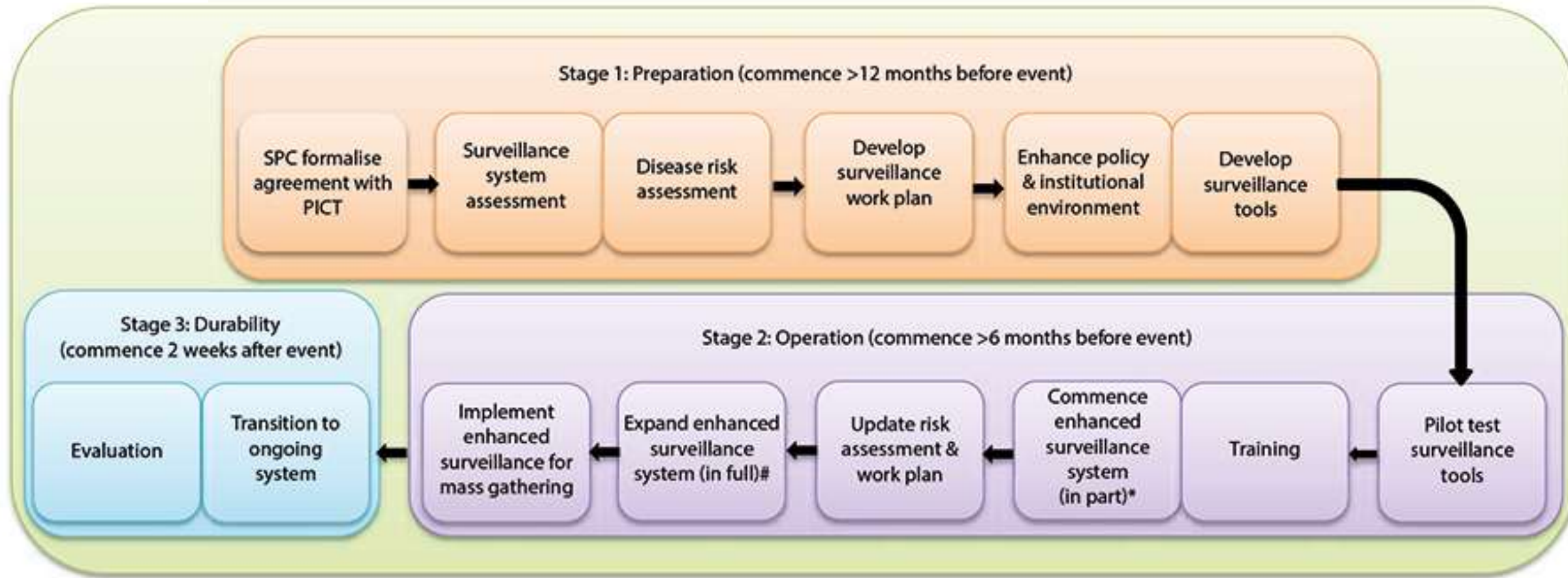
Committee of  
Representatives of  
Government and  
Administrators







# Standardised Approach: 3-stage process



# Risk assessment done in reference to an optimal situation to identify gaps

❑ Surveillance system assessment

❑ Disease risk assessment

❑ Risk assessment on 5 factors

- General factors
- Venue factors
- Behavioral factors
- Epidemiological factors
- Environmental factors



Ocular inspections and site visits to complement desk reviews and interviews



# Enhance policy and institutional environment

Updating of surveillance protocols and guidelines

Standard case definitions and thresholds

Algorithms, record forms and other tools adapted to local context



## Syndromes and Conditions for Enh. 17<sup>th</sup> Pacific Games Sol 2023 – Honiara.

PCL

## Sol2023 Pacific Games Command Post Phone Call Log

Syndromes / Conditions	Case definition	Info
Influenza-like illness	Measured fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) or self-reported fever AND cough with onset within the last 10 days	Influenza Other
Acute fever and rash	Sudden onset of fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) AND acute non-vesicular (not blisters) rash	Measles Chikungunya
<b>Diarrhoea</b>	Three or more loose OR watery stools in 24 hours	Watery stool Non-watery stool
Prolonged fever	Any fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) lasting 3 or more days	Dengue fever Malaria
Dengue-like illness	Fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) for 2 days AND 2 or more of the following: Severe headache or pain behind the eyes, nausea/vomiting, muscle aches and joint pain, maculopapular rash, bleeding tendencies, low white blood cell count ( $<4000/\text{ml}$ ), conjunctivitis, tourniquet test positive, malaria test negative* * For local population Warning signs: abdominal pain, vomiting, mucosal bleeding, accumulation, enlarged liver	Chikungunya Typhoid fever Zika
Acute fever and jaundice	Any fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) AND jaundice (yellowing of the skin)	
Food-borne illness	Gastro-intestinal symptoms (upset stomach, indigestion, no habits (e.g., diarrhoea, constipation) originating from same food	
Heat-related illness	Dehydration due to heat, heavy sweating, paleness, muscle and vomiting, fainting, extremely high body temperature ( $\geq 40^{\circ}\text{C}$ )	
Stings	Fever, body aches, tenderness with localized swelling near the site(s) OR travel history to places with known stings	
Any unusual health events	Any unusual or unexplained health events, seen or are reported and group or clusters of illness.	

#	Date and Time	Call from ...	Person who received call	Nature of phone call request	Other details	Act
		Name		<input type="checkbox"/> Investigation <input type="checkbox"/> Risk communication		<input type="checkbox"/> Released to
		Team		<input type="checkbox"/> Lab sample collection <input type="checkbox"/> Public health action		<input type="checkbox"/> Time relayed
		Location		<input type="checkbox"/> Others		<input type="checkbox"/> No action
		Name		<input type="checkbox"/> Investigation <input type="checkbox"/> Risk communication		<input type="checkbox"/> Released to
		Team		<input type="checkbox"/> Lab sample collection <input type="checkbox"/> Public health action		<input type="checkbox"/> Time relayed
		Location		<input type="checkbox"/> Others		<input type="checkbox"/> No action
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		Team		<input type="checkbox"/> Lab sample collection <input type="checkbox"/> Public health action		<input type="checkbox"/> Time relayed
		Location		<input type="checkbox"/> Others		<input type="checkbox"/> No action



Laboratory Test Directory 9 <sup>th</sup> Micro Games 2015, Federated States of Micronesia							
Syndrome	Case Definition	Specific Diseases to Consider	Lab. Test	Type of Sample	Type of Container	Volumes Required	Storage/Transportation Requirement
Acute Fever and Rash (AFR)	Sudden onset of fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) AND acute non-vesicular (not blisters) rash	Measles, Rubella, Dengue, Leptospirrosis, Zika, Chikungunya, Meningococemia	GPH, YSI, YSI & G, GPH, YSI	Serum, Serum/EDTA, Serum, Serum/EDTA	Purple-top tube, Red-top tube	3-5mls	Place sample in biohazard specimen transport bag with LAB SURVEILLANCE FORM(S) and deliver to Central Laboratory at the hospital
Diarrhoea	Three or more loose or watery stools in 24 hours	Watery stool: Cholera, Non-watery: Viral and bacterial gastroenteritis including food poisoning	YSI & GPHL	Stool	Clean cup container with leak-proof cover, Vial	1-30g (Equivalent quantity)	<ul style="list-style-type: none"> <li>Stool specimen delivered to the testing lab within 2 hours after collection</li> <li>Place in clean cup container with leak-proof screw-cap lid</li> <li>Collect blood for culture if patient has a fever <math>\geq 38.0^{\circ}\text{C}</math> / <math>100.4^{\circ}\text{F}</math></li> </ul>
Influenza-like illness (ILI)	Measured fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) or self-reported fever AND cough AND with onset within the last 10 days	Influenza, Other viral and bacterial respiratory infections	YSI, GPHL	NPS	Tube	Follow proper collection of NPS	Place sample in biohazard specimen transport bag with LAB SURVEILLANCE FORM and deliver to Central Laboratory at the hospital
Prolonged fever	Any fever lasting 3 or more days	Dengue fever, Malaria, Leptospirrosis, Typhoid fever, Bacterial infections, Influenza	YSI & GPHL, YSI, YSI, YSI, GPHL or DLS, YSI & GPHL	Serum, Serum/EDTA, Serum, Serum, NPS	Purple-top tube, Red-top tube, VTM tube	4-5mls	Place sample in biohazard specimen transport bag with LAB SURVEILLANCE FORM and deliver to Central Laboratory at the hospital
Dengue-like illness	Fever ( $\geq 38.0^{\circ}\text{C}$ or $100.4^{\circ}\text{F}$ ) for 2 days AND 2 or more of the following: Anorexia and nausea, aches and pains, maculopapular rash, low white blood cell count ( $<4000/\text{ml}$ ), tourniquet test positive	Chikungunya, Typhoid fever, Leptospirrosis, Zika	GPHL, YSI, YSI, GPHL	Serum, Serum, Serum/EDTA, Serum	Red-top tube, Purple-top tube		Place sample in biohazard specimen transport bag with LAB SURVEILLANCE FORM and deliver to Central Laboratory at the hospital

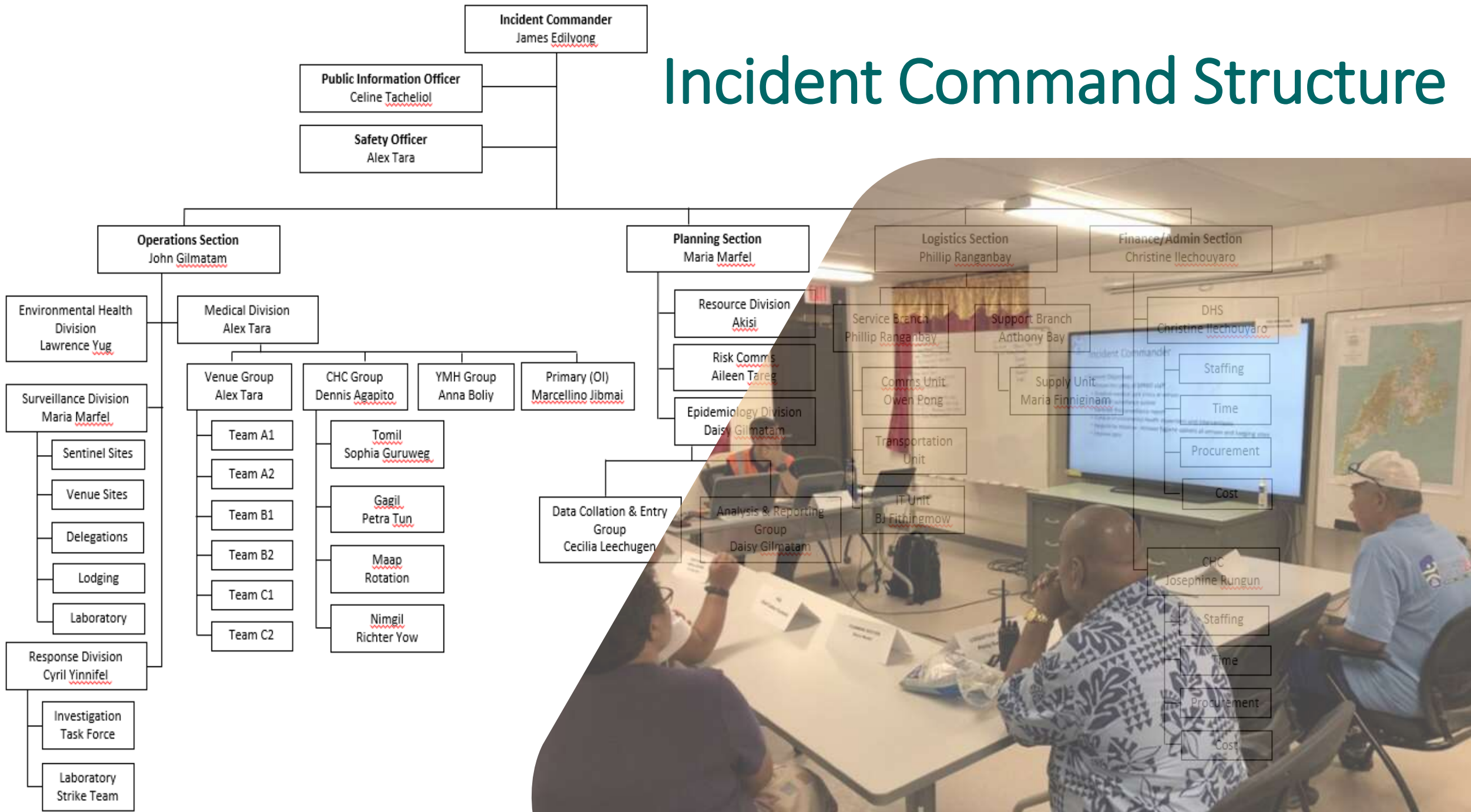
# Training for optimal performance

- Training workshops adjusted to the planned surveillance system
- Based on needs
- Table-top exercises
- Adapted tools





# Incident Command Structure



# Enhanced multi-source surveillance

- Syndromic surveillance
- Laboratory surveillance
- Event-based surveillance
- Injury surveillance
- Environmental monitoring



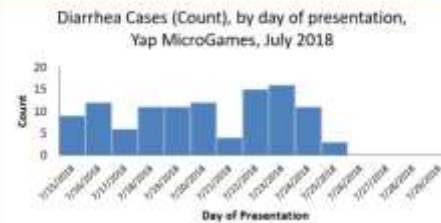
KEY UPDATES

**Surveillance Findings:**  
-Surveillance activities continue at all sentinel sites and sports venues  
-Majority (68%) of reported syndromes are diarrheal cases; 29% are influenza-like illnesses.  
**Rotavirus Outbreak:**  
-Outbreak is ongoing  
-Cleaning and sanitizing of high-traffic areas at all

SENTINEL SITE REPORTING

Syndromes (Bars show daily trends)	Total	%	Yap Hospital	Toni CHC	Gagr CHC	Ningit CHC	Maap CHC	Athlete's Village	Tamil Lodging	Sports Complex	Marine Venue
Acute liver and rash	0	0%	0	0	0	0	0	0	0	0	0
Any unusual health event	0	0%	0	0	0	0	0	0	0	0	0
Dengue-like illness	2	2%	0	2	0	0	0	0	0	0	0
Diarrhea	28	68%	23	0	0	3	0	1	0	2	2
Fever & jaundice	0	0%	0	0	0	0	0	0	0	0	0
Food-borne illness	0	0%	0	0	0	0	0	0	0	0	0
Heat-related illness	0	0%	0	0	0	0	0	0	0	0	0
Influenza-like illness	12	29%	10	0	2	0	0	0	0	0	0
Mumps	0	0%	0	0	0	0	0	0	0	0	0
Prolonged fever	0	0%	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>41</b>	<b>100%</b>	<b>33</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>2</b>

TRENDS OF KEY SYNDROMES



Influenza presentation



LABORATORY SURVEILLANCE

	Requested	Positive	(%)	Negative	(%)
Dengue RDT	2	0	0	2	100
Typhoid Fever	2	0	0	2	100
Leptospirosis RDT	2	1	50	1	50
Norovirus RDT	0	0	0	0	0
Rotavirus RDT	0	0	0	0	0
Hepatitis A	0	0	0	0	0
ILI	2	0	0	2	100
Mumps	0	0	0	0	0

EVENT BASED SURVEILLANCE

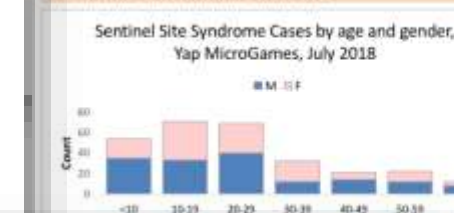
Event-based Surveillance collected reports from key stakeholders during the games including healthcare providers, team doctors, hotel operators, environmental health inspectors.

Notable Reports:

-1 of 16 tests done for sexually transmitted infections resulted

previous day. Green cells indicate a decrease from the previous day. Grey cells indicate those sites that didn't report for

CHARACTERISTICS OF CASES SEEN AT SENTINEL SITES



SENTINEL SITE LOCATIONS



ENVIRONMENTAL HEALTH MONITORING

Site Category	COM Athletes Village	YHS Athletes Village	Tamil Athletes Village
Toilet	80%	80%	100%
Kitchen	96%	96%	100%
Trash Disposal	67%	67%	100%
Living quarters	100%	50%	100%
Shower	100%	75%	100%
Grounds	100%	67%	100%

Activities and Notable Findings:

-Environmental health inspections of all lodging and sports venues continue  
-Trash disposal is better but still require improvement  
-Some living quarters in the athletes' village needs cleaning  
-Improper drainage in the shower area of Yap High School athletes' village remains a concern

Notes: Trends the past 24 hours: ▲ Improving ▬ No Change ▼ Poorer

Quality Markers: Poor Good

SPORTS INJURY SURVEILLANCE

SPORTS INJURY TYPE (Bars show daily trends)	Total	%	Yap Hospital	Toni CHC	Gagr CHC	Ningit CHC	Maap CHC	Athletes Village	Sports Complex	Marine Venue
sports-abrasions   cuts/scratches   lacerations	1	10%	0	0	0	0	0	0	1	0
sports-cardiac	0	0%	0	0	0	0	0	0	0	0
sports-dehydration   heat related	0	0%	0	0	0	0	0	0	0	0
sports-dislocation	2	20%	0	0	0	0	0	0	2	0
sports-fracture	0	0%	0	0	0	0	0	0	0	0
sports-head injury	0	0%	0	0	0	0	0	0	0	0
sports-respiratory	0	0%	0	0	0	0	0	0	0	0
sports-strain   sprain	3	70%	0	2	0	0	0	0	1	0
sports-others	0	0%	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>10</b>	<b>100%</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>5</b>

Notes: Red cells indicate an increase from the previous day. Green cells indicate a decrease from the previous day. Grey cells indicate those sites that didn't report for the day. Blue cells indicate the site was closed.



# Stage 3: Durability

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Transition



Evaluation

# Lessons identified for future similar events

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- Partnership and engagement is key
- Involvement of health focal points; being present where the target population would congregate
- Standard, consistent processes but not a one-size-fits-all approach
- Applying all-hazards risk-assessment approach to guide public health interventions and mitigation measures
- Pre-event targeted messaging on health risks and preventive / protective measures; ongoing health advise during and after the event
- Build upon the strengths and successes of national systems and regional support services for sustainability





Pacific Public Health Surveillance Network  
Réseau océanien de surveillance de la santé publique



## Closing message

6 services to prevent and respond to epidemics  
6 services pour prévenir et répondre aux épidémies



Syndromic surveillance  
surveillance syndromique  
for outbreak detection  
pour détecter les épidémies



PacNet  
for alert and communication  
pour alerter et communiquer



LabNet  
for verification and identification  
pour confirmer et identifier



EpiNet  
for preparedness and response  
pour la préparation et la réponse



PICNet  
for infection control  
pour lutter contre les infections en  
établissements de soins



SHIP (DDM)  
for capacity building  
pour le renforcement des capacités

October 2024  
Commonwealth Heads of  
Government Meeting, Samoa

6-16 June 2024  
Festival of Pacific Arts & Culture  
Honolulu, Hawaii

# Upcoming mass gathering events

27 July – 5 August 2024  
2024 Summer Olympics – Surfing  
Tahiti, French Polynesia

19 Nov – 2 Dec 2023  
Pacific Games, Honiara, Solomon Is



# Acknowledgement

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- Yap State Health Department: James Idilyong, Maria Marfel, Aileen Tareg, Daisy Gilmatan
- Pohnpei State, Federated States of Micronesia: Eliaser Johnson
- PIHOA/CDC: William Thane Hancock
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- WHO Vanuatu Country Office: Phillip Guyant
- Public Health Division – SPC: Christelle Lepers, Thibaut Dimaneuf, Salanieta Saketa, Amy Simpson, Talica Cabemaiwai, Eka Buadromo, Margaret Leong
- PPHSN core and allied members



Extra slides

## SPC assistance to mass gathering surveillance dates to 2012

**2012** 11<sup>th</sup> Festival of Pacific Arts, Solomon Islands

**2013** 9<sup>th</sup> Pacific Mini Games, Wallis and Futuna

**2014** 8<sup>th</sup> Micronesian Games, Pohnpei State, Federated States of Micronesia

**2015** Commonwealth Youth games, Samoa

**2016** 12<sup>th</sup> Festival of Pacific Arts, Guam

**2017** 10<sup>th</sup> Pacific Mini Games, Vanuatu

**2018** 9<sup>th</sup> Micronesian Games, Yap State, Federated States of Micronesia

**2019** 16<sup>th</sup> Pacific Games, Samoa (risk assessment and laboratory augmentation)

**2023** 17<sup>th</sup> Pacific Games, Solomon Islands (ongoing preparatory assistance)