2.6 IOWave20 Preliminary Results

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ICG/IOTWMS Working Group 2 Meeting, 3-4 November 2021

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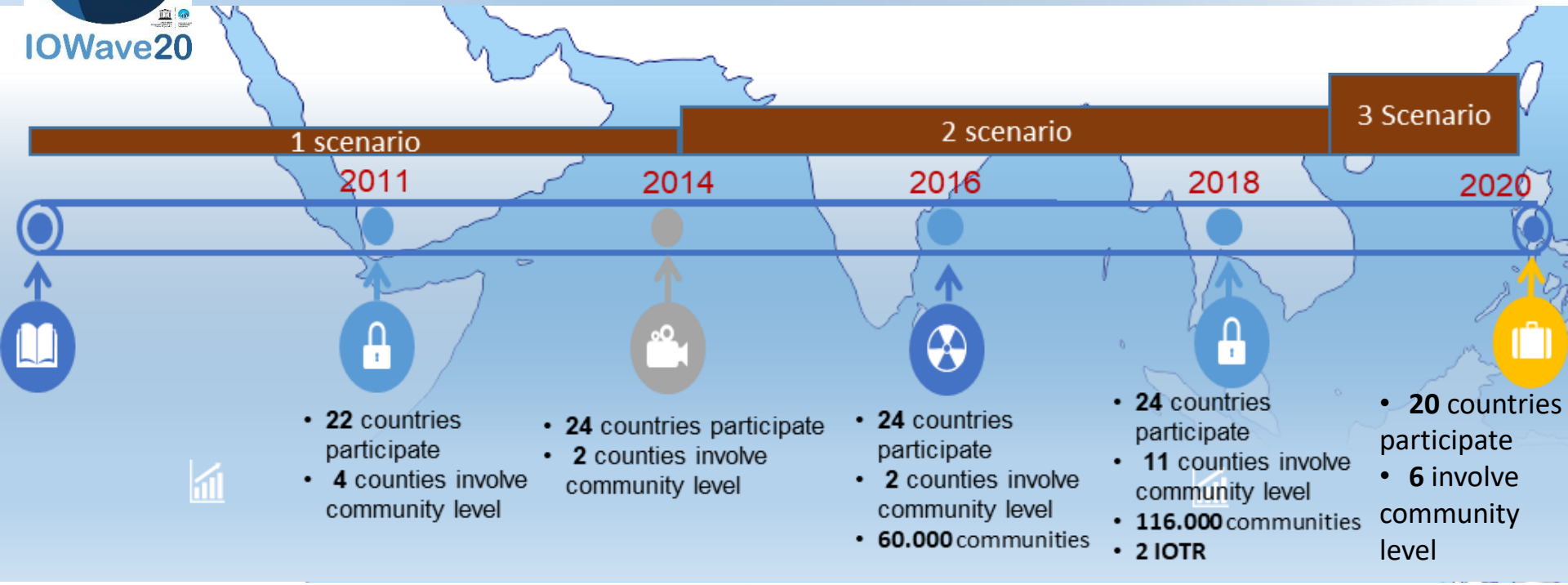
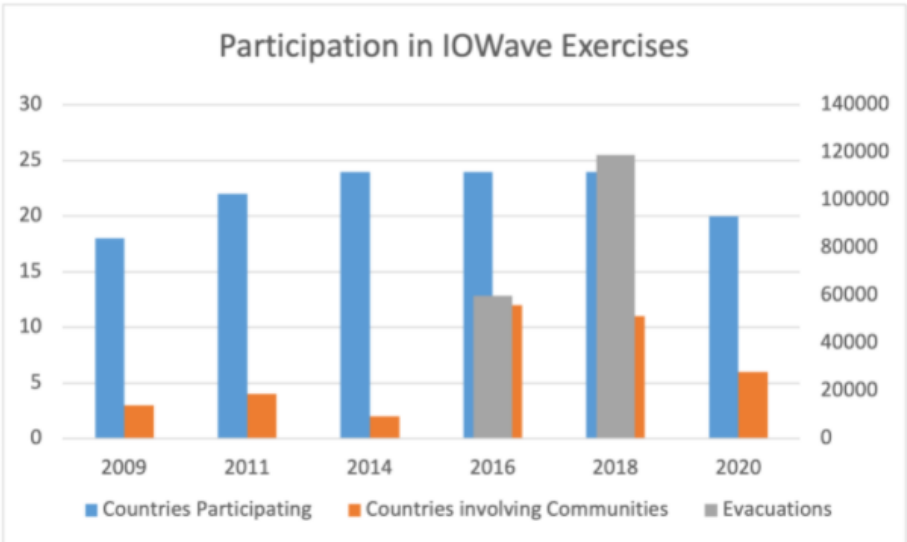
History of Indian Ocean Exercises

IOWave20





Evolution of Ocean Wide Exercises in the Indian Ocean

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POSTED ON JULY 6, 2021

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IOWave20 Scale & Objectives

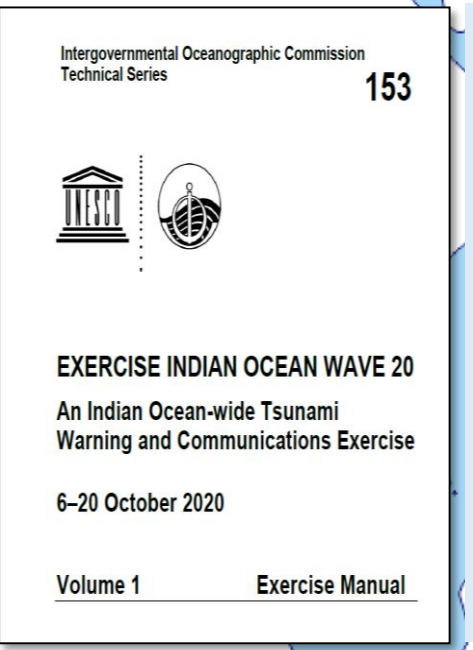
Scale:

- Due to the ongoing Covid-19 pandemic, the scale of IOWave20 was reduced in comparison with previous exercises.
- Member States were encouraged to test communication protocols and conduct a “virtual” table-top exercise (as a minimum).
- Emphasis was placed on updating organisational Standard Operating Procedures, plans and policies for tsunami warning and emergency response during a pandemic.

Objectives:

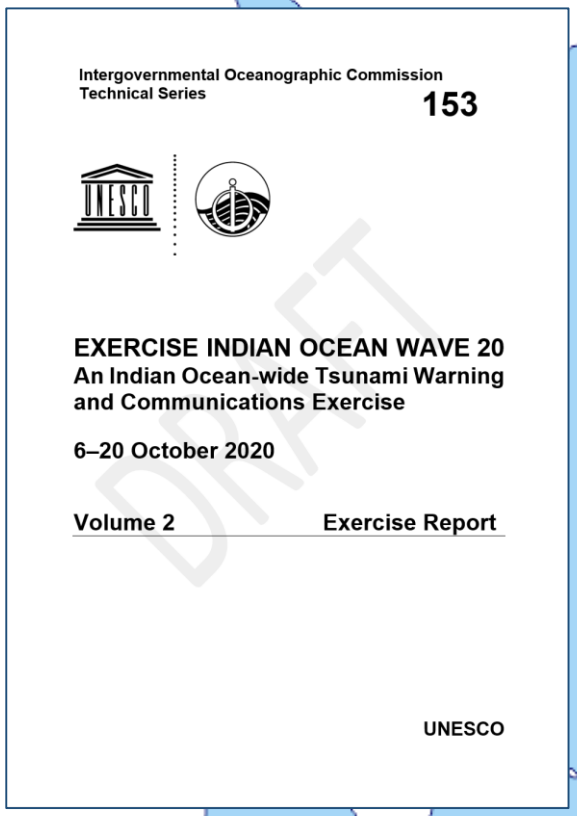
1. Validate the dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWCs via Tsunami Warning Focal Points (TWFPs) of Indian Ocean countries and the reception by NTWCs of the TSP messages.
2. Validate the access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information for the production of national warnings.
3. Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.

Methodology



- IOWave20 was held **during the Covid-19 pandemic**, which is affecting countries around the world and in the Indian Ocean region
- Exercise Indian Ocean Wave 2020 was held over two-weeks, **6-20 October 2020 --- 1 week intervals on 6, 13 and 20 October**
- Exercise Indian Ocean Wave 2020 contained **three earthquake scenarios with all scenarios run in real-time --- Each scenario was held in real time over a 1-hour duration.**
- For each scenario, the **TSPs issued four tsunami bulletins in real time over a 1-hour period.**
- IOC-UNESCO conducted **on online assessment** that was coordinated in country by the IOWave20 National Contacts.
- To date **20 Indian Ocean Member States** reported their participation in the IOWave20 evaluation survey.

Draft Report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EXERCISE INDIAN OCEAN WAVE 20
An Indian Ocean-wide Tsunami Warning and Communications Exercise

6–20 October 2020

Volume 2 Exercise Report

UNESCO

DRAFT

- Report based on online evaluation survey and post-IOWave20 workshop (Nov. 2020)
- Available on WG-2 meeting website
- Draft report shared with TNCs and National Exercise Contacts
- Draft report be presented to the Intersessional Meeting of ICG/IOTWMS for approval (23-24 Nov. 2021)
- Final feedback requested by end of November 2021
- Publication anticipated by end of 2021 / early 2022

Scenarios

IOWave20

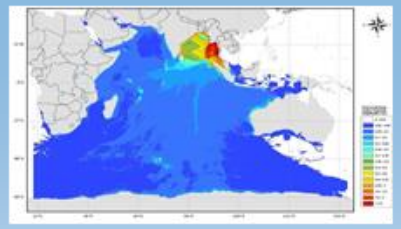
1. Java Trench

6 October 2020; 03:00 UTC; M9.1; 10 Km; 10.40 S, 112.80 E, South of Java, Indonesia

20 countries under threat

2. Andaman Trench

13 October 2020; 04:00 UTC, M9.2, 10 Km, 12.65 N, 93.50 E, Off West Coast of Andaman Islands, India



18 countries under threat

3. Makran Trench

20 October 2020; 06:00 UTC, M9.0, 10 Km, 24.8 N, 62.2 E, Off Coast of Pakistan

21 countries under threat

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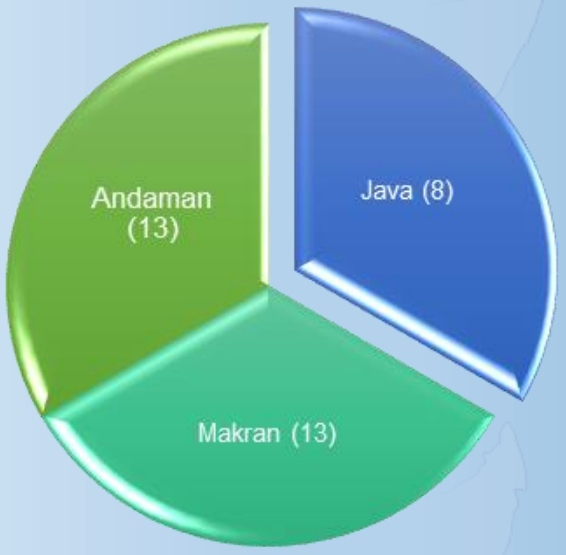
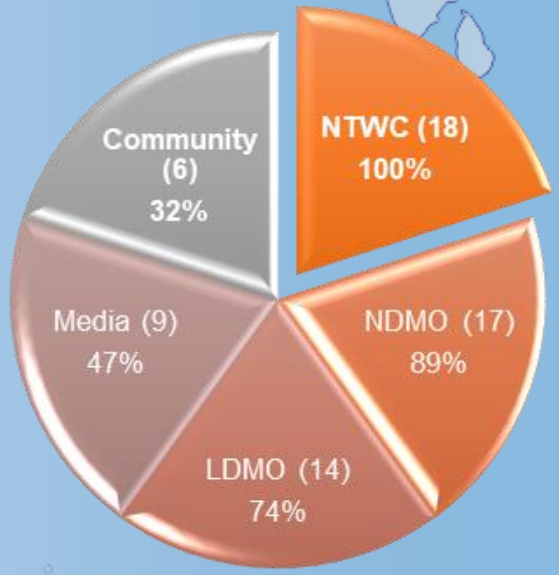
Participation

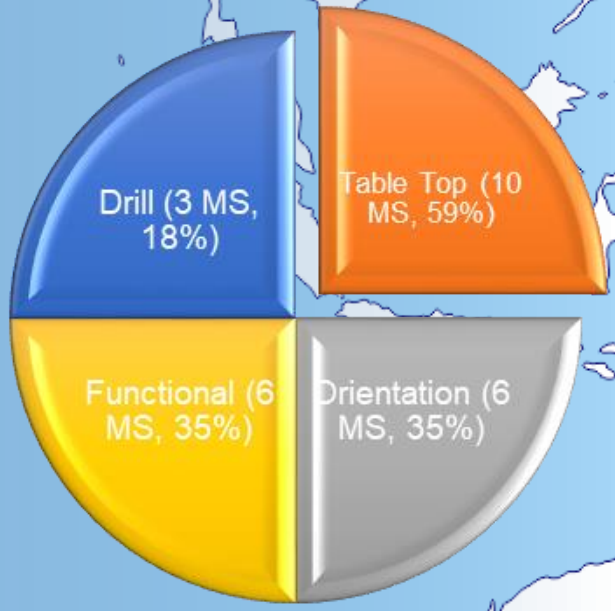
20 Countries completed online survey: Australia, Bangladesh, Comoros, India, Indonesia, Kenya, Madagascar, Malaysia, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Singapore, South Africa, Sri Lanka, Thailand, United Arab Emirates and Yemen



- **Scenario**



- **Participants**



- **Type of Exercise**

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Downstream Response

Despite the ongoing pandemic, six countries reported community involvement.

- Indonesia held an evacuation drill at the New Yogyakarta International Airport involving 120 people.
- Kenya involved 3 coastal communities (Kwale, Mombasa, Kilifi) in tsunami awareness activities.
- Mauritius conducted a simulation exercise in a small coastal community.
- Seychelles involved community stakeholders in a full scale exercise.
- Mozambique and Thailand responded to the survey that communities were involved, but did provide details.

Upstream Response

Scientists at the Oman National Multi Hazard Warning Center participate in Exercise IOWave20 (October 2020).

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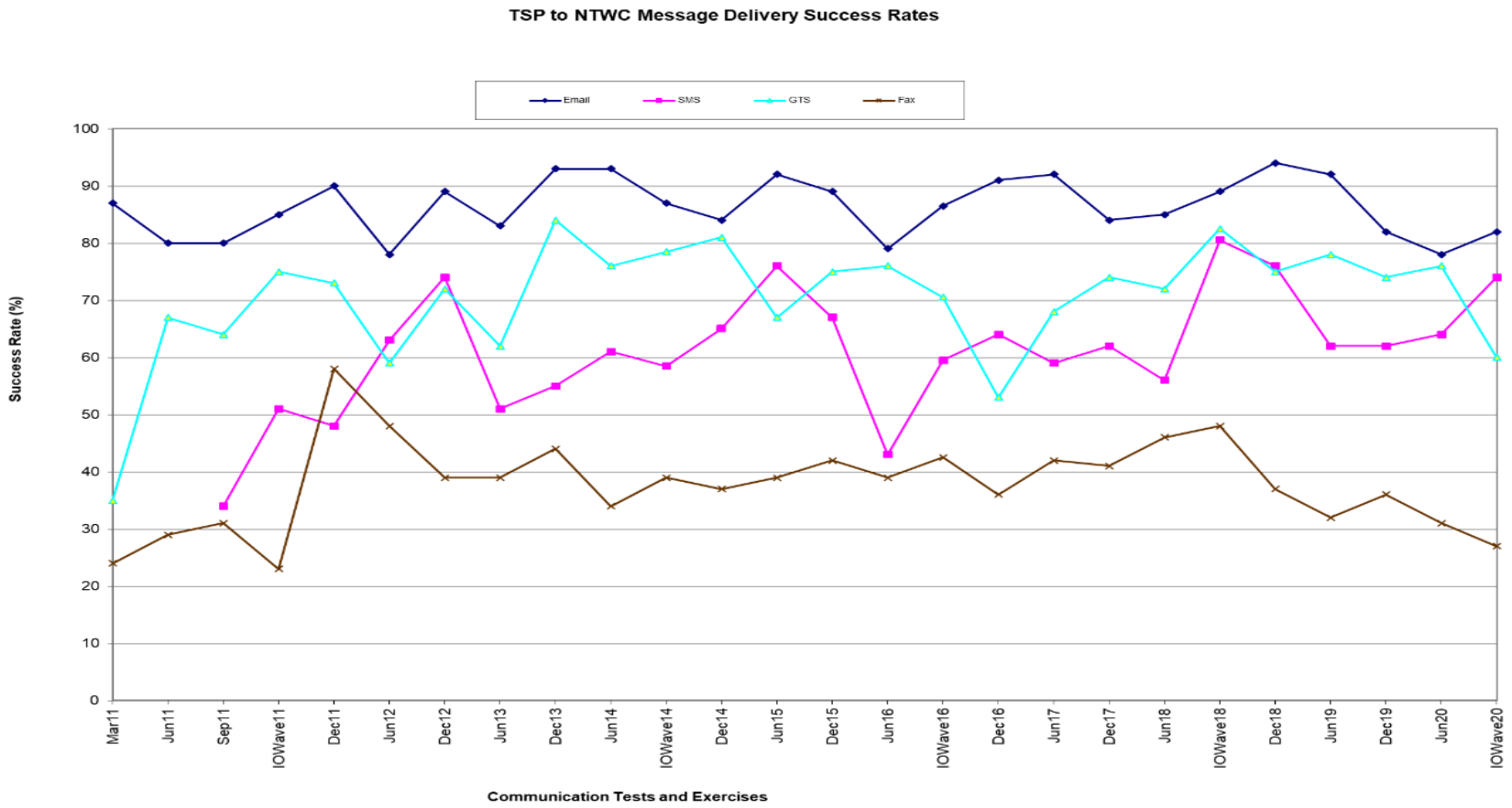
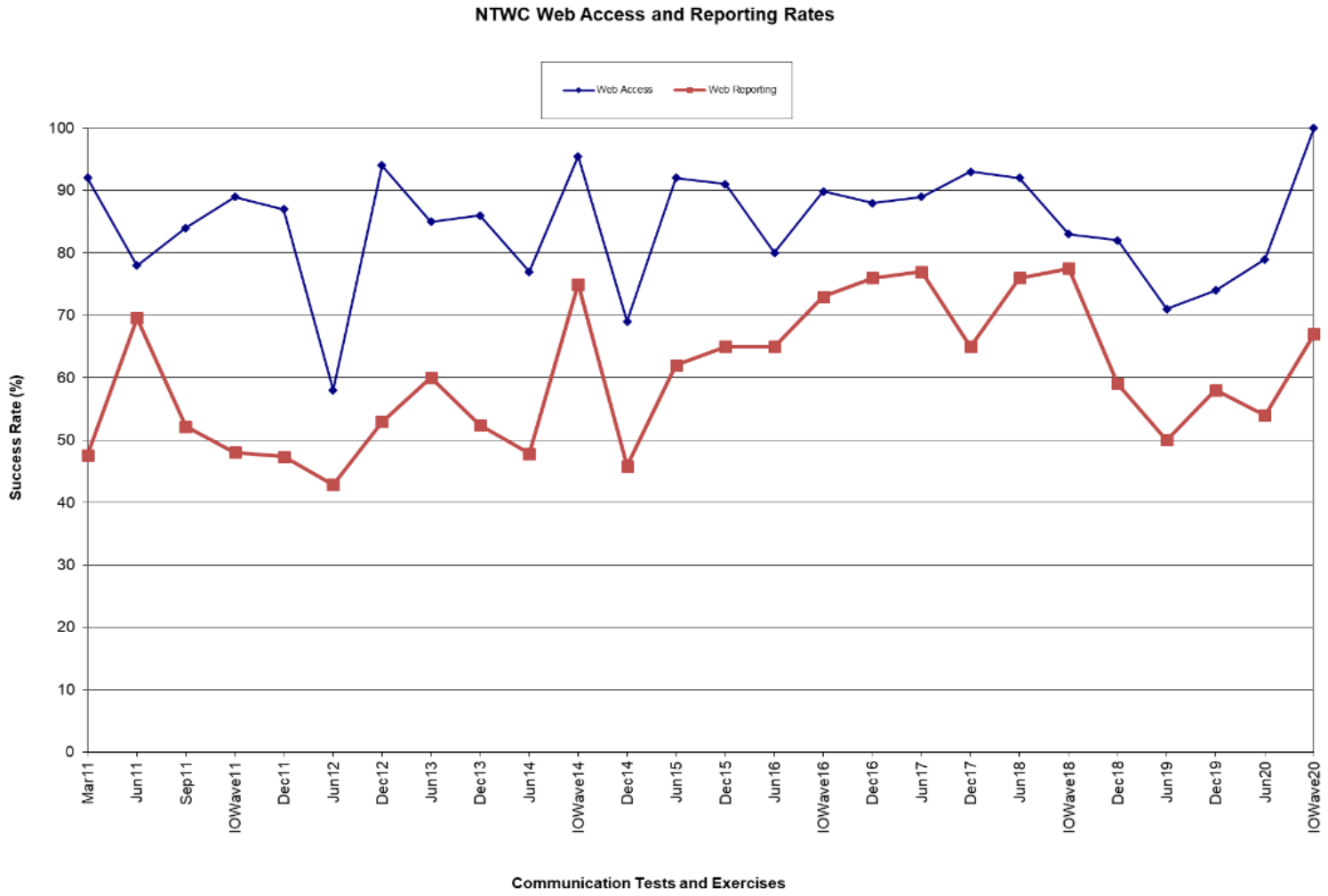
Timeliness of Message Dissemination

IOTWS-TSP	Java Scenario (out of total 8 responses)			
	Email	GTS	SMS	Fax
Australia	75%	86%	63%	25%
India	75%	100%	75%	38%
Indonesia	75%	86%	88%	25%
Average	**75%**	**90%**	**75%**	**29%**
IOTWS-TSP	**Andaman Scenario (out of total 12 responses)**			
	Email	**GTS**	**SMS**	**Fax**
Australia	83%	92%	67%	33%
India	75%	92%	58%	33%
Indonesia	75%	83%	75%	25%
Average	**78%**	**89%**	**67%**	**31%**
IOTWS-TSP	**Makran Scenario (out of total 12 responses)**			
	Email	**GTS**	**SMS**	**Fax**
Australia	67%	82%	75%	27%
India	83%	82%	58%	36%
Indonesia	92%	91%	45%	18%
Average	**81%**	**85%**	**60%**	**27%**

Message Delivery Success Rates



NTWC Web Access and Reporting Rates



TSP Threat Information used in National Warnings

TSP	TSP Tsunami Threat Information	All Scenarios (15 NTWCs reporting)
TSP-Australia	Tsunami Wave Observations	53%
	T1 Predicted Wave Arrival Time	53%
	T2 Predicted Wave Arrival Time	53%
	T3 Predicted Wave Arrival Time	40%
	T4 Predicted Wave Arrival Time	40%
	Predicted Maximum Wave Amplitudes	73%
	Coastal Forecast Zone Threat Levels	33%
	Other	20%
TSP-India	Tsunami Wave Observations	73%
	T1 Predicted Wave Arrival Time	60%
	T2 Predicted Wave Arrival Time	73%
	T3 Predicted Wave Arrival Time	53%
	T4 Predicted Wave Arrival Time	33%
	Predicted Maximum Wave Amplitudes	67%
	Coastal Forecast Zone Threat Levels	53%
	Other	13%
TSP-Indonesia	Tsunami Wave Observations	53%
	T1 Predicted Wave Arrival Time	60%
	T2 Predicted Wave Arrival Time	47%
	T3 Predicted Wave Arrival Time	47%
	T4 Predicted Wave Arrival Time	40%
	Predicted Maximum Wave Amplitudes	80%
	Coastal Forecast Zone Threat Levels	53%
	Other	20%

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Recommendations: General

- IOWave Exercises should use scenarios that are suitable for all Member States to participate, 3 scenarios worked well for coverage.
- Holding the scenarios 1-week apart worked well.
- The Exercise should be conducted in September to avoid cyclone season preparation [Australia; India]. However, after IOWave18 it was noted that September is inconvenient for some countries due to Monsoon and Floods [Pakistan, India, Sri Lanka] and hot weather [Oman].
- Coordinate with PTWS to ensure Exercises occur in opposite years [Australia, Indonesia, Timor Leste].
- International observers should be included in future exercises (such as IORA) [India] and virtual observations should be utilised more widely.
- Consider informing more national leaders of the Exercise in addition to the Tsunami National Contacts.
- Document the lessons learnt and changes triggered from the Exercise (i.e. establish a monitoring mechanism).

Recommendations: WG-2

- Establish **a work mechanism between NTWCs and TSPs** to solve communication issues (i.e. non-receipt of messages).

- Regarding the **low fax receipt rate**, it is proposed to include the following question in the **next communications test evaluation** (8-Dec):

  Does your NTWC want to continue to receive TSP notification messages via Fax?
  - Yes, we want to keep receiving notifications via Fax.
  - No, we receive Fax but are not reliant on it.
  - No, we do not have the capacity to receive Fax.
  - Other

- WG-2 to identify **reliable tide gauge stations with fast transmission rates**.

- Consider having the **TSPs send an SMS/email notification whenever there are tsunami product updates** (ex. Tide gauge observations).

- Conduct a **risk assessment of upstream tsunami warning including dissemination of tsunami warnings, reliable resources, etc.**

Recommendations: Global Coordination

- Conduct **IOTWMS and PTWS exercises in opposite years.**
  - 2022 PTWS
  - 2023 IOTWMS
- **Encourage to test/verify the UNESCO-IOC Tsunami Ready Indicators** during the Exercise.
- Provide guidelines for conducting **virtual table-top exercises.**
- Agree **common exercise objectives and Exercise success criteria** among all ocean basins.

IOWave20

Thank you! Terimakasih!

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