



1st SAFETYNET Scientific Conference
Canberra, Australia
12-15 September 2023



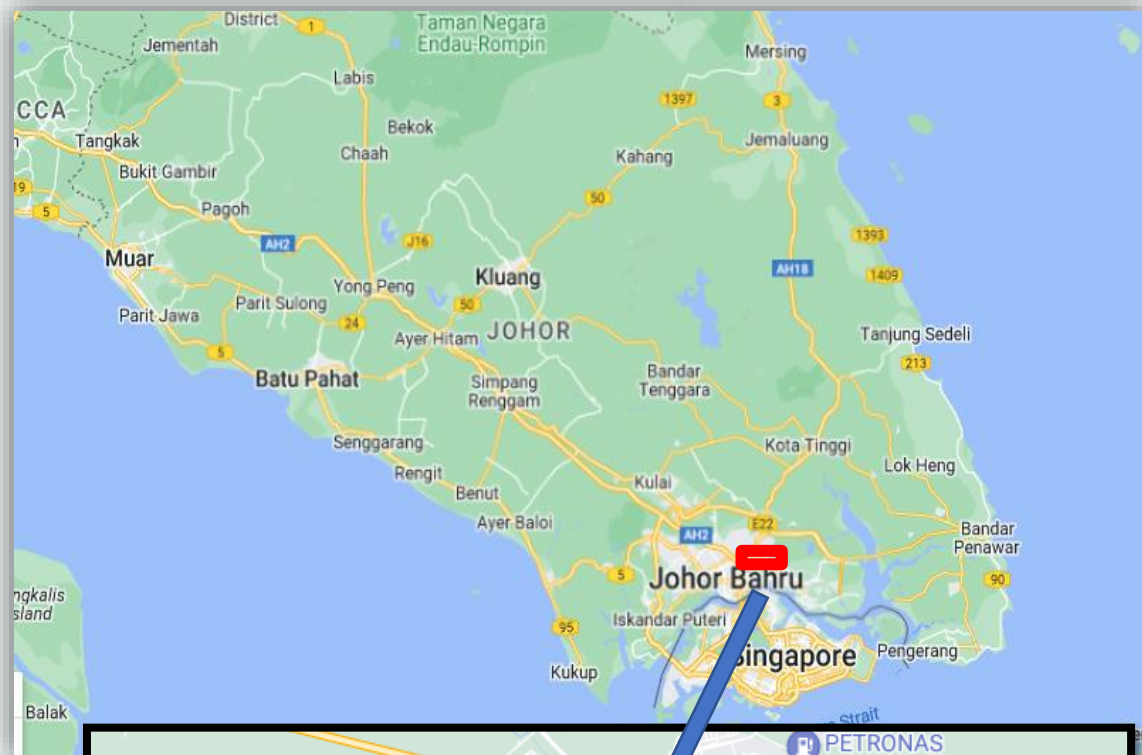
ERADICATING POLIO: LEAVING NO STONE UNTURNED – JOHOR BAHRU, MALAYSIA, 2022

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EIP Malaysia Trainee



- ❑ Malaysia achieved polio free status since 2000
- ❑ Reappearance of polio infection in many parts of the world.
- ❑ Sustaining the polio free status is becoming a great challenge
- ❑ Maintaining high population immunity against polio and high quality surveillance for poliovirus detection is critical.



- ❑ **8 April 2022** - Johor Bahru District Health Office (DHO) received notification of a case of acute flaccid paralysis - surveillance
- ❑ On **7 September 2022**, case was classified as polio compatible as decided during the 2nd Expert Review meeting (ERM)
- ❑ Case: 4-year-old male child (3rd of 4 siblings) from **Taman Putri Wangsa, Johor Bahru, Johor Malaysia** with 2 samples (no virus detected) and residual paralysis at 60 days' follow up

- To verify the polio compatible status of the case by epidemiological, laboratory and environmental investigation
- To assess the risk of polio importation and transmission in Johor Bahru.

Tools

Source of data

EPIDEMIOLOGICAL INVESTIGATION

1. Case Investigation	<ul style="list-style-type: none"> • Face-to-face interview 	Parents of the case, treating doctors, staff and medical records officer of admitting hospitals
2. Field Survey for ACD	<ul style="list-style-type: none"> • Questionnaire check list 	Population within 1 km radius from the house of case.

Additional epidemiological investigation

1. AFP trend 2021- Aug 2022	<ul style="list-style-type: none"> • Review of E-notis records 	AFP cases from DHO Johor Bahru data
2. HFMD trending March-May 2022	<ul style="list-style-type: none"> • Review of E-notis records 	E-notis & CDC data from DHO Johor Bahru
3. Vaccination coverage profile – Polio vaccine 3 rd dose coverage	<ul style="list-style-type: none"> • Review of MCH records 	Data review from 2017 till 2021 (Family Health Unit, DHO Johor Bahru)
4. Search for any missed AFP notifications	<ul style="list-style-type: none"> • Review of hospital records 	Medical records from casemix unit from 3 hospitals (1 private and 2 govt)

Tools

Source of data

LABORATORY INVESTIGATION		
• Clinical samples of case	Clinical records	Lab result from treating hospital & case file review
• Radiological Findings <input type="checkbox"/> Ultrasound <input type="checkbox"/> MRI	Clinical records	Radiological reporting review
• Close contacts and 10 healthy children stool sample	Clinical samples	Lab results
ENVIRONMENTAL INVESTIGATION & SURVEILLANCE		
• Environmental assessment of population and exposure	Walk through survey Water quality safety parameters	Face to face interview with residents, public and private health clinics, cleaners, vendors Data from Water Quality Surveillance Unit
• Environmental Sewage Water Surveillance for polio	Suitability of site for sampling	- Site visit - Review records (Polio environmental surveillance)
RISK ASSESSMENT (LOCALITY)		
	MOH risk assessment criteria (3 main parameters)	Vaccination coverage Polio surveillance data CDC data



Population susceptibility assessment

- Polio vaccine 3rd dose coverage (5 year trend)
- Cumulative population at risk (not covered by polio vaccine over 5 years)
- Number of district or operational areas with coverage < 95%
- Number of Measles outbreak > 10 cases per locality over 5 years
- Percentage of AFP cases without complete polio vaccination over 3 years

Surveillance quality assessment

- Non polio AFP rate (5 years average)
- Percentage of AFP cases with adequate stool sample (5 years)

Threat assessment

- Presence of non-citizen children < 5 years old
- Detection of VDPV in AFP cases or ES sample

No.	Risk Category	Score
1.	Low risk	≤ 20
2.	Medium risk	21 - 49
3.	High risk	≥50

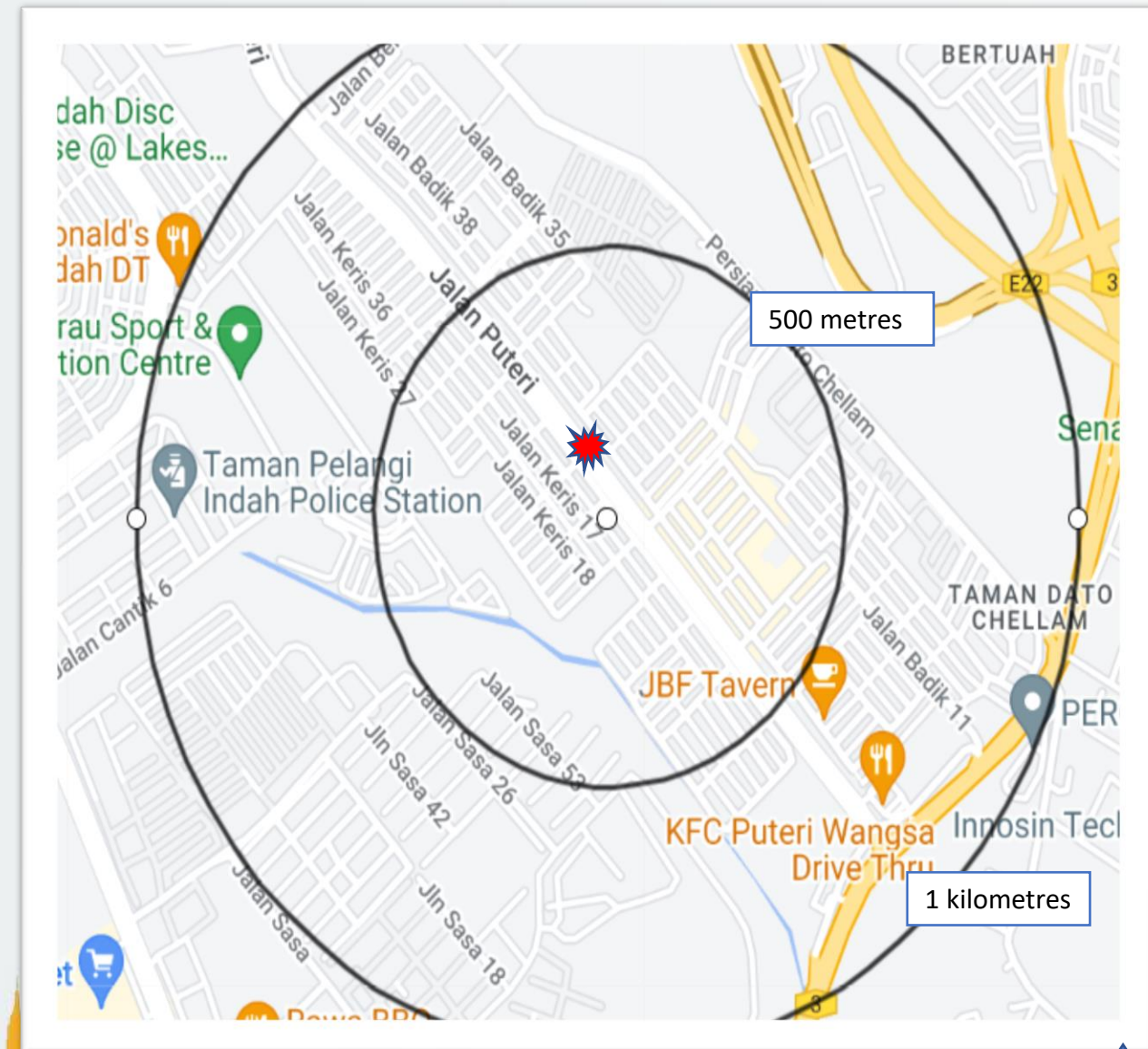
*The methodology used is based on Ministry of Health guidelines and adapted from WHO.



Any person aged 15 years old and below staying at **within 1 km radius from patient's home** with a history of neurological deficit (lower limb weakness, myalgia, neck pain, back pain, seizures, cramps) for the past 6 months.

NOTE: Include HFMD, chicken pox and measles as the differential diagnosis, questions on HFMD, chicken pox and measles occurrence and its complication was also asked for amongst these children (based on literature review)

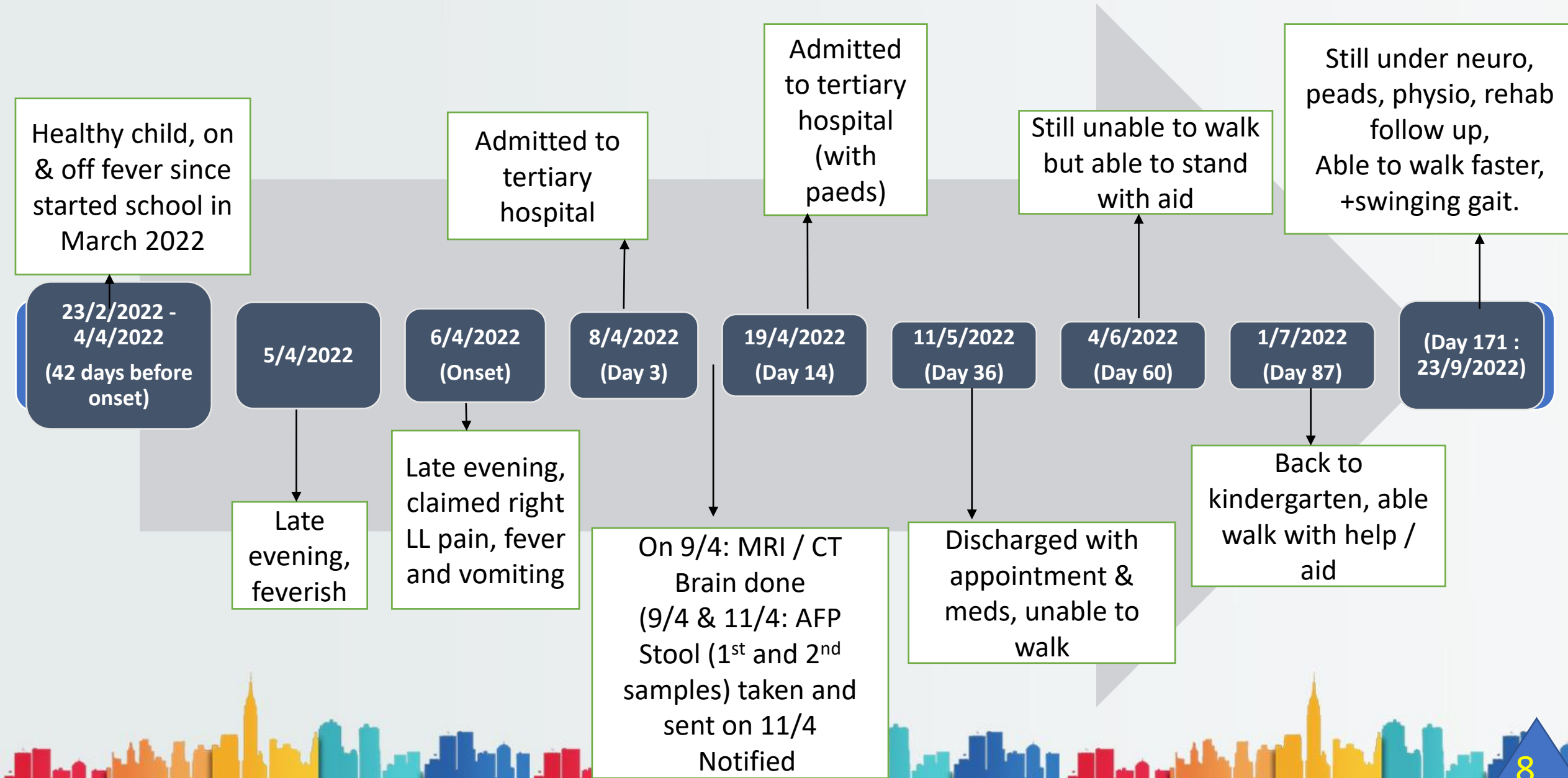
NOTE 2: 1 km due to density of urban setting



Epidemiological Ix: Chronology of events



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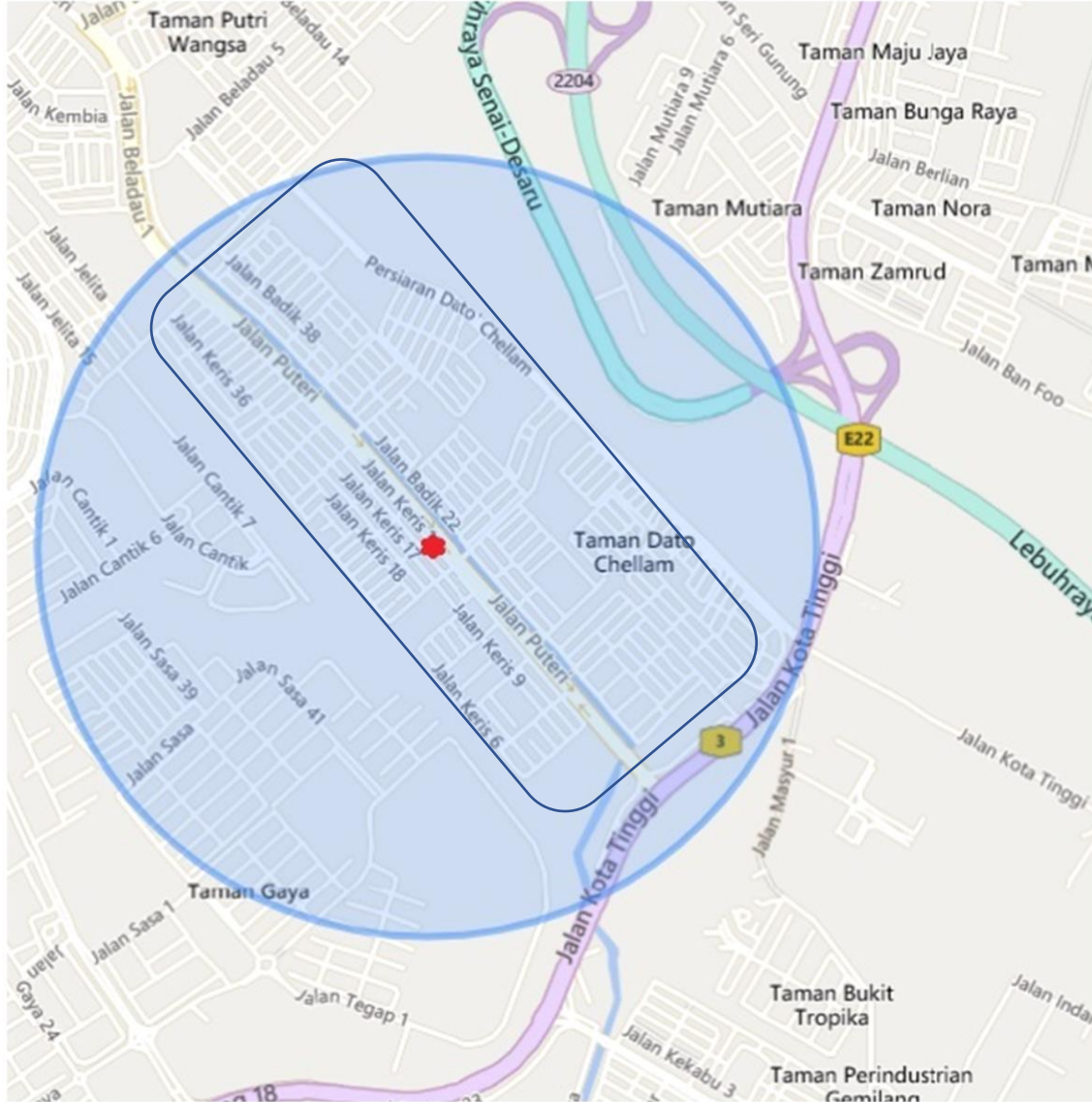


PAST MEDICAL HISTORY	History of asthma Eczematous skin lesions < 1 year old Hospitalisation history: 2 admissions prior
BIRTH HISTORY	SVD 3.25kg (uneventful)
DEVELOPMENTAL HISTORY	No delays; As per age
IMMUNISATION HISTORY	Complete up to 18 months (National Immunisation Programme)
FAMILY HISTORY	6 persons living in the same household (parents and 3 siblings ages 9, 7 and 3) Has cats; 1 died due to Feline Parvovirus
EXPOSURE HISTORY	No visitors from outside that year. Only parents siblings came on & off, no history of illness among them. No major events/celebrations took place this year. Stay at home most of the time. No shared playground activities. Never heard of any children with similar illnesses in the neighbourhood No history of similar illnesses among children in siblings kindergarten/school



Blood & Urine Investigation	Result
Full blood profile (FBC/LFT/RP/RBS/UFEME); HFMD; Covid-19 RT-PCR; Ganglioside autoimmune profile (AiNeuroP8); Autoimmune ganglioside monosialic acid IgM; Mycoplasma pneumonia IgM; Blood Culture	Nothing abnormal detected
HSV type 1 & 2 IgM/IgG	HSV type 1 IgG Reactive (451.7)

Radiological Screening	Date	Findings
MRI Brain	09.04.2022	Normal
MRI Cervical / Thoracic / Lumbar Spine	09.04.2022/ 25.5.202	Impression: 1. Intradural nerve roots enhancement, which in clinical context is consistent with AIDP. 2. T12/L1 cystic lesion, likely Tarlov cyst. Anterior horn T2 hyperintensity raised the possibility of demyelination.
USG KUB	04.07.2022	Normal



ACD was conducted on 21 & 22 September 2022

- **975 children (100%)** from **1491 households** visited had complete immunization.
- **9 (0.9%)** had clinically diagnosed HFMD & **1 (0.1%) fever with rashes** in the last 6 months. All recovered well with no complications. **No clusters**
- **6 kindergartens – no clusters or similar illness**

JALAN : JALAN BADIK 24 HINGGA JALAN BADIK 44 (22/09/2022)

TEAM	BIL RUMAH	BUKA	TUTUP	ENGGAN	KOSONG	JUMLAH PENGHUNI	BIL.KANAK KANAK (0-15 THN)	JUMLAH PENGHUNI BUKAN W/NEGARA (? Kanak / ? Dewasa)	Hx HFMD	BIL TADIKA	NAMA TADIKA	STATUS IMUNISASI	CATATAN
1	23	22	0	0	1	81	15	0	0	0		LENGKAP	
2	39	26	9	1	3	99	23	0	1 MEASLE	0		LENGKAP	
3	47	24	18	3	2	94	19	0	0	0		LENGKAP	
4	48	30	16	2	0	120	27	0	0	0		LENGKAP	
5	54	49	0	0	5	199	67	1	0	1	TADIKA KEMAS SRI ALZANA (JALAN BADIK 38)	LENGKAP	
6	32	23	5	0	4	86	20	0	0	0		LENGKAP	
7	30	18	7	2	3	84	12	1	0	0		LENGKAP	1 BWN , 1 WN OKU
8	30	23	4	2	1	110	19	0	0	0		LENGKAP	1 SKOLIOSIS
9	44	28	9	1	6	86	12	0	0	0		LENGKAP	
10	40	27	9	1	3	104	22	0	0	0		LENGKAP	
11	29	20	8	0	1	82	24	0	0	0		LENGKAP	
12	40	31	5	1	3	112	16	0	0	0		LENGKAP	
13	42	33	4	0	5	129	23	1	0	0		LENGKAP	1 BWN , 48 TAHUN
14	35	16	17	0	2	49	7	0	0	0		LENGKAP	
	306	3	1 MEASLE	1									

Questionnaire for ACD

AFP Notifications Trend

Date: 1 Jan 2022 to 20 September 2022

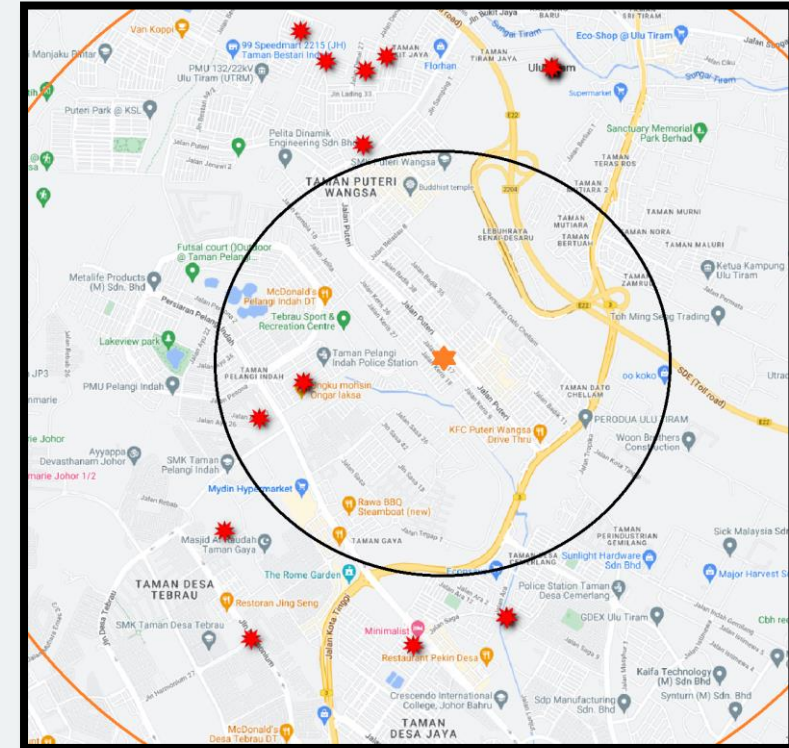
- 15 cases of AFP notified
- **All Discard (except this case)**
- No clustering by locality

AFP Missed Notifications

Date: 1 Jan 2022 to 20 September 2022

Documents: 1 private hospital and 2 government hospitals

- 12 cases fulfilled definition
- **All 12 cases notified**
- All cases fulfilled stool sampling criteria

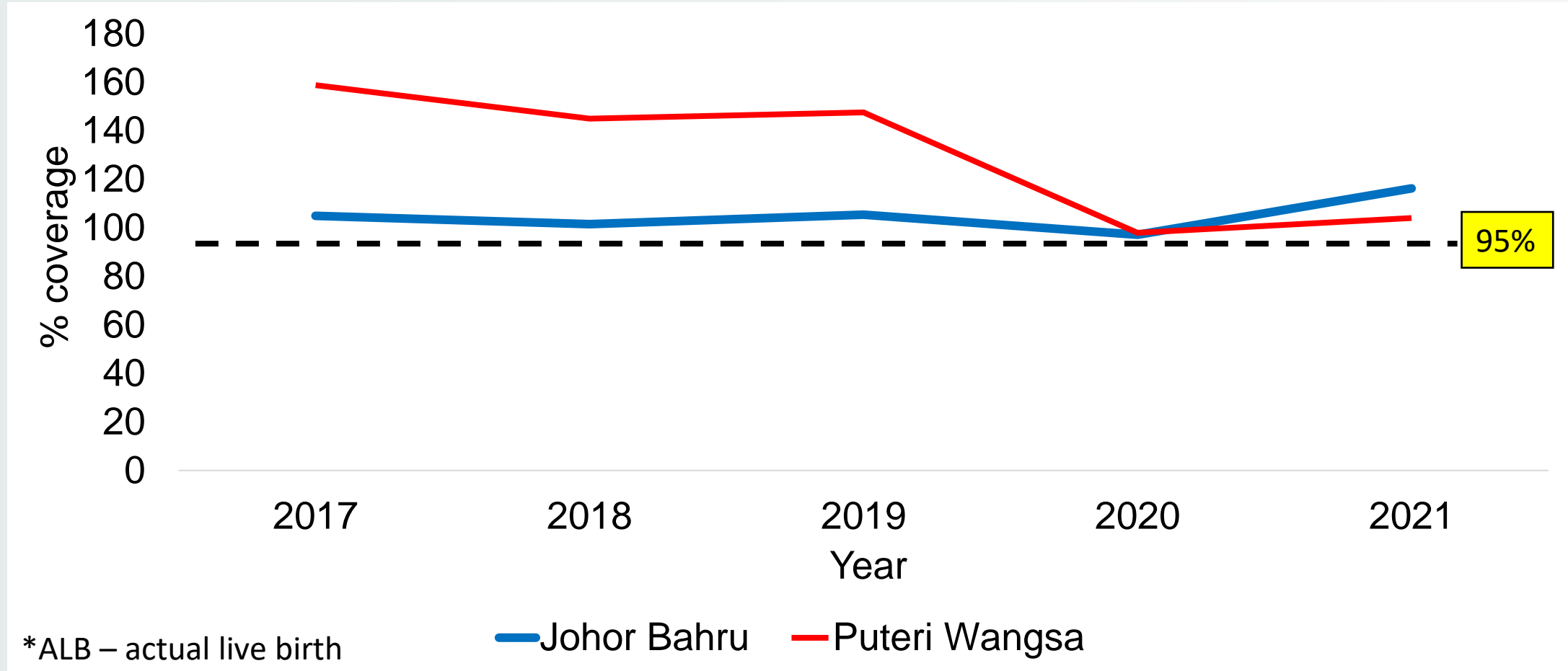


HFMD cases

Date: March to May 2022

- **No cases** reported in the housing area of the AFP case
- **No outbreaks** reported

5 year average polio vaccine 3rd dose coverage



IMMUNIZATION COVERAGE OF HEXAVALENT (DTaP-IPV-HiB-Hep B) BY MOH & OTHER AGENCIES

Method: Review of family health unit records

Date: 2017-2021

CLINICAL SAMPLES OF CONTACTS

Type of Investigation	Findings
Stool samples of three siblings aged less than 15 years	All negative for poliovirus
Stool samples from 10 healthy children from the Puteri Wangsa area	All negative for poliovirus



- Malaysian: majority residents
- Non-Malaysian: Myanmar **refugees with family sporadically** live within the community.
- All children vaccinated at the government clinic

3km surrounding:

- **No slums**
- Local business centre: retails enterprises: Non-Malaysian (factory workers single: Bangladesh, Nepalese & Vietnamese) work in the area
- **Treated water supply and under municipality**
- **Health facilities:**
 - 3 Private Clinics:
 - 1 Government health clinic:
 - 1 Government hospital:



- Polio environmental surveillance program in Seri Alam Sewage Treatment Plan (STP) since 2019 in Johor Bahru
- All samples from Seri Alam STP: **No polio virus isolated**
- Jan to Dec 2022 – 4 samples positive for NPEV
- September 2022 - Samples from additional new STP which covered Puteri Wangsa area taken : **No polio virus isolated**

No.	Parameters	Max unweighted score	Weight	Max weighted score	Final score
1	Population susceptibility	1	5	5	5
2	Surveillance quality	0	3	0	
3	Threat	0	10	0	

FINAL SCORE= 5 (LOW RISK)

Epidemiological Ix

1. Child **completed immunization.**
2. **High** vaccination coverage in the area and in the district of Johor Bahru
3. ACD found **no similar cases with neurological deficit** in the locality.
4. **No missed AFP notifications** from the selected health facilities

Laboratory Ix

HSV Type 1 IgG was positive but **no clinical correlation**
Tarlov cyst had **no clinical correlation**
Stool samples from close contact (Siblings) - **negative for poliovirus.**
Stool samples from targeted 10 healthy children - **negative for polio virus**

Environmental Ix

Walk through survey – **No risk found**
Environmental Polio Surveillance - **negative**

Polio Risk Assessment

**Score of 5
(LOW RISK)**

This case was classified as non polio AFP

Sustained
AFP
surveillance

To strengthen the awareness on AFP notification and surveillance among in both private and government health facilities.

Early detection
and timely
notification

Increase rumor surveillance among the local leaders in the community to encourage notification of any case with neurological deficit.

Maintaining high
levels of vaccine
coverage

To ensure vaccine coverage is optimum at all operational areas and to minimize missed vaccinations or defaulters yearly



Acknowledgement: Johor Bahru District Health Office Team

