

Tsunami disaster in Thailand, ICU experience

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Tsunami disaster

- **Dec. 26, 2004 in Andaman Sea, India Ocean**
- **Causing: 214,344 death**
 - : 142,079 missing**
 - : 34,410 injured**

WHO. Tsunami & health: situation report No. 31. Jan 29,2005





Thailand

Tsunami occurred for the first time

**Damaging 6 provinces: Phuket,
Phung-Nga, Krabi, Ranong, Trang and Satun**

Causing : 5,392 death

: 3,100 missing

: 8,457 injured

Tsunami in Thailand

•Takuapa General Hospital

a district hospital, 177 beds

- Patients were : brought to ER 2,285
- injury- mild 1,625
 - moderate 390
 - severe 270
- admitted 628
- After stabilization, wound cleansing, suturing, giving antibiotics and tetanus toxoid; they were transferred to other hospitals

•Takuapa General Hospital

a district hospital, 177 beds

Patients were admitted	628
• Foreign tourists	294
• Foreign labors	24
• Thai, both tourists & locals	310

Takuapa General Hospital

The patients admitted to ICU up to Dec 31,04

Total of patients 19

- Improved (sending to wards) 5
- Transferred 7
- Expired 5
- *On respirators with septic shock* 2
- There were 2 more Tsunami pts transferred to ICU for respirators

Tsunami in Thailand

Medical volunteer team from Rajavithi Hospital

Wilai Puavilai, MD ; Pairaj Kateruttanakul, MD
Subsai Kongsengdao, MD; Sakarn Bunnag, MD
Napa Siriwatanakul,MD; Anan Kriangkrichoke, MD
Kriangsak Atipornwanij,MD
 Pornchanok Nontasut, Pulmonary RN.
(with bronchoscope & equipments, potent antibiotics)

Medical Residents

Korn; Pariwat; Sureeratana; Charnsak
Parinya; Nathanan; Krisada
Kamol :Nephrology Fellow

Tsunami in Thailand

•Clinical	Pt.1	Pt.2	Pt.3	Pt.4
Manifestation				
•Age/gender	39/ male	26/female	64/female	35/female
•Salt water aspiration	yes	yes, near drowning	yes	yes
•First day of disaster admission	yes/ICU	yes/ICU	no, OPD case	yes, regular ward
•Co-morbidity				
- wound(s)	yes	no	yes, penetrating	yes, Lt. leg
- other	pelvic fracture	Premature labored	DM	Lt. fibula open fracture
•Antibiotic (conventional)	IV	IV	PO	IV

Tsunami in Thailand

•Clinical Manifestation	Pt.1	Pt.2	Pt.3	Pt.4
•Age/gender	39/ male	26/female	64/female	35/female
•Respiratory support	yes	yes	no	no
•Shock	yes (dopamine)	yes (dopamine)	no	no
•On 6th day - chest X-ray	worsening pneumonia/ pul. Congestion	worsening severe pul. congestion	resp. failure Lobar(Rt.>Lt.) pneumonias	VF in OR non-cardiac pul. Edema
•Ventilator/ FI O2/PEEP	yes/FI O2(0.4- 0.6)/low	yes/FI O2(0.7 -0.9)/high	yes/FI O2(0.6- 0.8)/moderate	yes/FI O2(0.7 -0.9)/high
Continuous Sedation	no	yes (twice)	no	yes
Complication	non-cardiac pulmonary congestion	ARDS UGI bleeding pneumothorax	septic shock	shock, resp. failure pneumothorax

Tsunami in Thailand

•Clinical Manifestation	Pt.1	Pt.2	Pt.3	Pt.4
•Age/gender	39/ male	26/female	64/female	35/female
Organisms				
-sputum	<i>P. aeruginosa</i> , <i>Klebsiella</i> spp.	<i>P. aeruginosa</i> , <i>Neisseria</i> spp.	<i>B. pseudomallei</i> , MRSA, <i>E.coli</i> , <i>Enterobacter</i> spp.	cultured negative
-Blood	no growth	no growth	<i>B. pseudomallei</i>	no growth
-Vx. Discharge	-	<i>Sternotrophomonas</i> spp.	-	-
-Antibiotics IV	Meropenem /ciprofloxacin / metronidazole	imipenem/ clindamycin/ ciprofloxacin/ cotrimoxazole (oral)	imipenem/ clindamycin ciprofloxacin/ vancomycin/ cotrimoxazole (oral)	meropenem/ metronidazole IV
-				





Figure 6 Sequence of radiological findings showed diffuse infiltration with ARDS (6A), then rapidly progressive course (6B),and (6C). Pt.2

Near Drowning

Acute respiratory failure

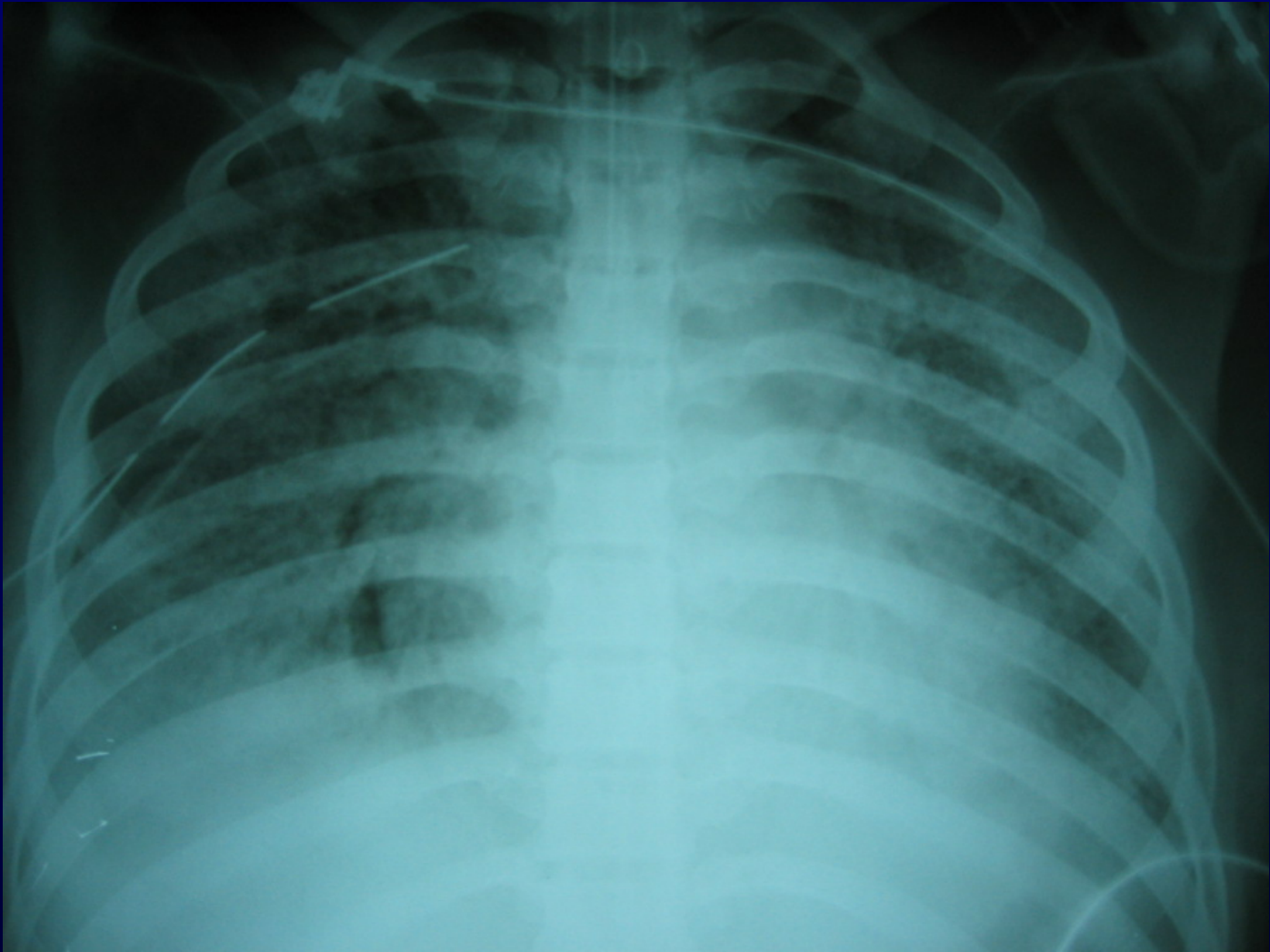
- Failure of gas exchange due to inadequate function of one or more essential components of the respiratory system
- Diagnosis :
hypoxemia $P_{O_2} < 60$ mmHg at sea level
or
 $P_{CO_2} > 45$ mmHg

Near Drowning

Acute respiratory distress syndrome (ARDS)

- A clinical syndrome of severe dyspnea, rapid onset of hypoxemia and diffuse pulmonary infiltration, leading to respiratory failure
- Caused by diffuse lung injury from many underlying medical and surgical illness
- Diagnosis :

$$aP_{O_2} \text{ (mmHg)} / FiO_2 \text{ (inspiratory } O_2 \text{ fraction)} < 200 \text{ mmHg}$$



Lobar Pneumonias Rt.> Lt.



Pt.3







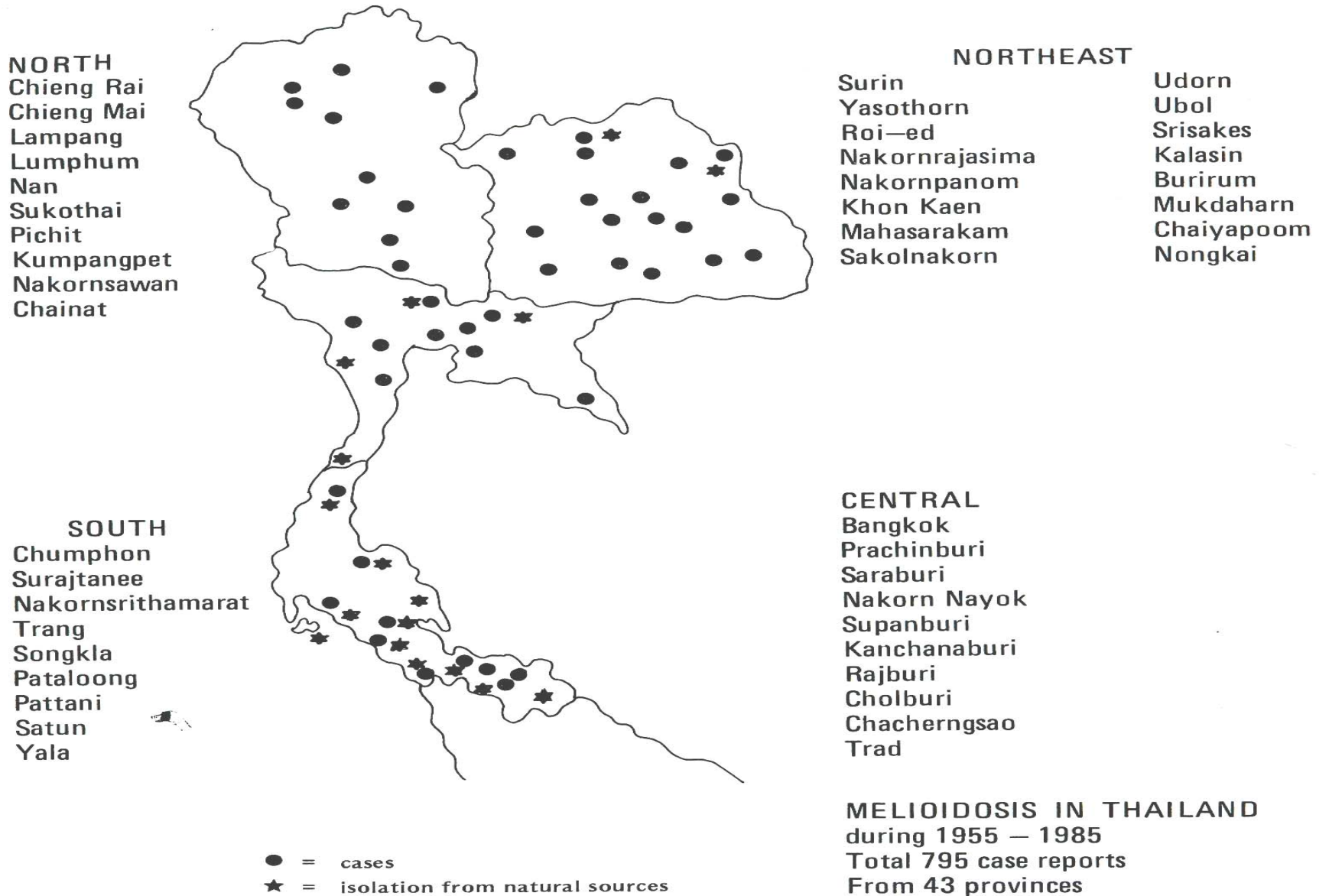


Fig. 1 Distribution of reported melioidosis cases and isolation of *Ps. pseudomallei* from natural sources in Thailand.

Tsunami in Thailand

There were 4 pts, serious Cardio- Cerebrovascular problems after Tsunami disaster ≥ 7 days, admitting to ICU

**- Acute coronary syndrome (ACS):AMI 2
(having salt water aspiration)**

- Acute pulmonary edema 1

(underlying hypertrophic obstructive cardiomyopathy with no significant CAD)

- Ischemic stroke with siezure 1

(underlying aspirated pneumonia from salt water aspiration)

All 8 Tsunami ICU patients got intensive treatment:

- close monitoring of FI O₂, PEEP, BP, finger-tip oxymetry
- continuous IV sedation & muscle relaxant in severe respiratory failure/ARDS
- potent (empirical) antibiotics
- negative fluid balance ~400-600 ml/d keeping BUN :Cr \leq 20:1 in pts with pulmonary congestion

Resulting in no hospital mortality

Tsunami in Thailand

One young looked healthy man, salt water aspiration from Tsunami, having *non-septicemic pulmonary melioidosis (Burkholderia pseudomallei)*, with underlying HIV positive



Antibiotics: ceftazedime + cotrimoxazole

Lessons from Tsunami disaster:

- Wound cleansing properly, if contaminating with soil, mud, salt water
- Aware about Melioidosis (*B. pseudomallei*) from soil, mud from South- western Thailand contaminated wounds, aspiration; especially having underlying DM, HIV positive
- There should be an internist/pulmonary physician in a mobile rescuer team with potent antibiotics and a volume respirator.





