



Pneumasil introduction in Timor-Leste

Nevio Sarmento
Chair of PCV Sub-committee NITAG- TL
& Researcher at Menzies School of
Health Research, Darwin, Australia

Ndjamena, Chad, 14 September 2023



OUTLINE

- **Background: brief story of Timor-Leste**
 - **About Timor-Leste**
 - **National Health System Delivery**
 - **Few milestones**
 - **History EPI Programme**
 - **Current immunisation schedule in Timor-Leste**
 - **Pneumonia and malnutrition in Timor-Leste**
 - **Pneumonia mortality**
 - **Pneumonia in children under 5 in ASEAN countries**
 - **Malnutrition in ASEAN countries**
 - **Evidence from the National Hospital Timor-Leste**
- **NITAG-TL PCV recommendation**
 - **NITAG-TL Technical Subcommittee on Pneumococcal Disease**
 - **Vaccine schedule for Timor-Leste**
 - **Target population**
 - **Catch-up program**
- **Pneumococcal carriage studies**
- **Pneumosil introduction**
 - **Activities**
 - **coverage**
- **Lesson learned**
- **Next plan**



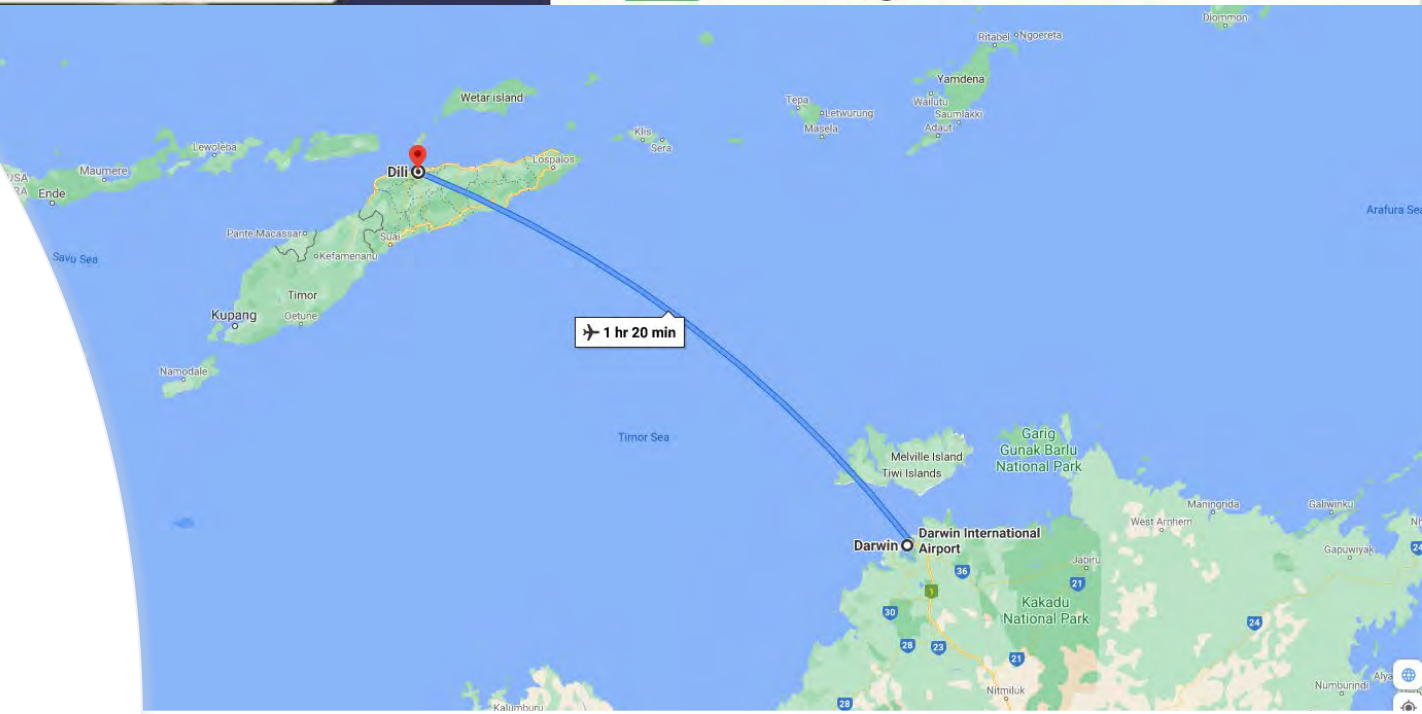
Background

Brief story of Timor-Leste



Background: About Timor-Leste

- Timor-Leste regained independence in 2002, following years of occupation
- Estimated 1,3 million population and 39% are of 1-14 years old (**TL 20022 population census**)
- Timor-Leste has 12 main municipalities located on the eastern half of Timor Island and one autonomous municipality (Oecusse) which is an enclave inside West Timor.





UNAMET

Do you **ACCEPT** the proposed special autonomy for East Timor within the Unitary State of the Republic of Indonesia?
 Apakah anda **MENERIMA** usul otonomi khusus untuk Timor Timur di dalam Negara Kesatuan Republik Indonesia?
 Ita Boor SIMU proposta autonomia especial ba Timor Lorosa'e iha Estado Unitário República Indonesia nia larar?
 Apakah a autonomia especial proposta para Timor Leste integrada ao Estado Unitário da República da Indonesia?

OR ATAU KA OU

Do you **REJECT** the proposed special autonomy for East Timor, leading to East Timor's separation from Indonesia?
 Apakah anda **MENOLAK** usul otonomi khusus Timor Timur, yang akan mengakibatkan berpisahnya Timor Timur dari Indonesia?
 Ita Boor LA SIMU proposta autonomia especial ba Timor Lorosa'e, ne'e sei lori Timor Lorosa'e atu hakatak an hosi Indonesia?
 Rejeita a autonomia especial proposta para Timor Leste, levando à separação de Timor Leste da Indonesia?

ACCEPT MENERIMA HA'U SIMU ACEITO

REJECT MENOLAK HA'U LA SIMU REJEITO



AUSTRALIAN WAR MEMORIAL P03184.037



AUSTRALIAN WAR MEMORIAL P03184.037



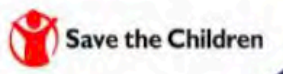
Photo credit: Australian National Museum

Background: National Health Service Delivery in Timor-Leste



- Process of nation-building is ongoing
- Free universal health coverage to Timorese citizen is implemented
- Major advancement are seen but gaps remaining
- Maternal and under five mortality still occur
- Health seeking behaviour and access to health care are poor
- High burden of undernutrition, TB, Hepatitis B and other infectious diseases.

Schematic of hospital system delivery in Timor-Leste



Background – few milestones

Manel Yapabandara et al. *Malar J* (2020) 19:104
<https://doi.org/10.1186/s12936-020-03162-3>

Malaria Journal

RESEARCH **Open Access**

From malaria control to elimination within a decade: lessons learned from Timor Leste, a newly independent country

A. M. G. Manel Yapabandara^{1,2*}, Maria do Rosario de Fatima Mota², Raul Sarmiento², Johanes don Bosco² and Rajitha Wickremasinghe³



South-East Asia

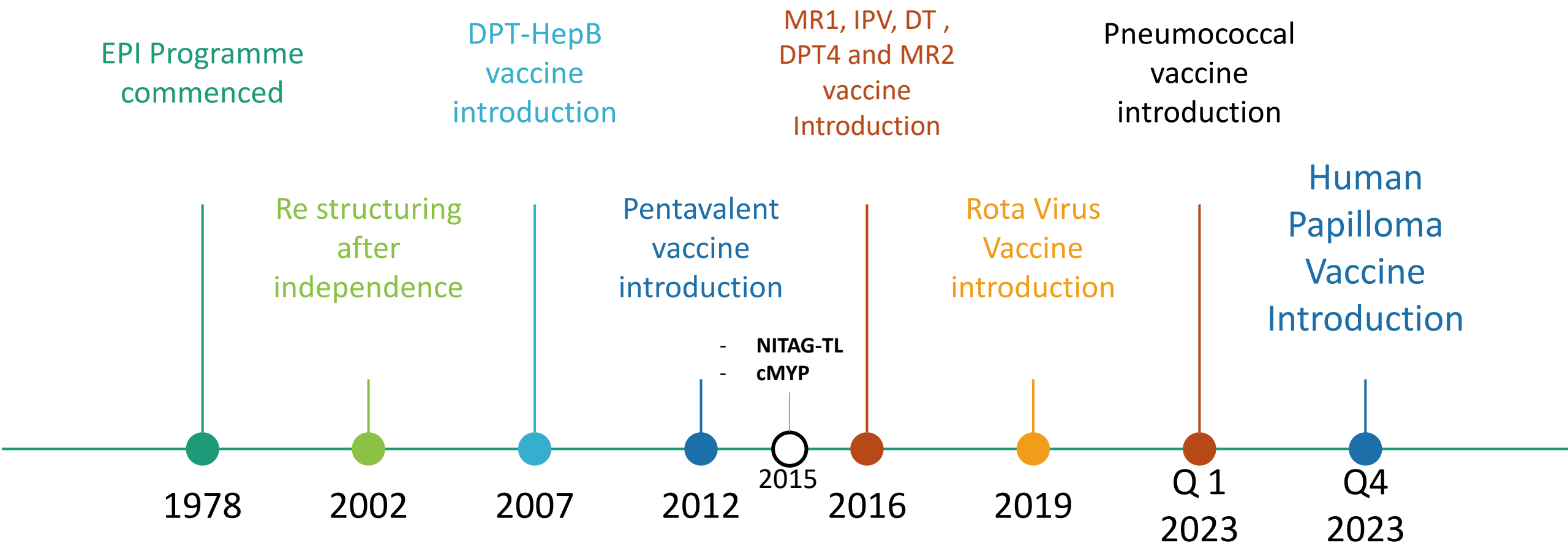
Bhutan, Timor-Leste eliminate rubella; Achieve 2023 target of measles and rubella elimination

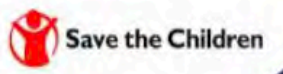
21 July 2023 | News release | New Delhi

The World Health Organization South-East Asia Region today announced Bhutan and Timor-Leste have eliminated rubella, a highly contagious disease that causes serious illness and irreversible birth defects in newborns of women infected during pregnancy, but preventable through vaccination.

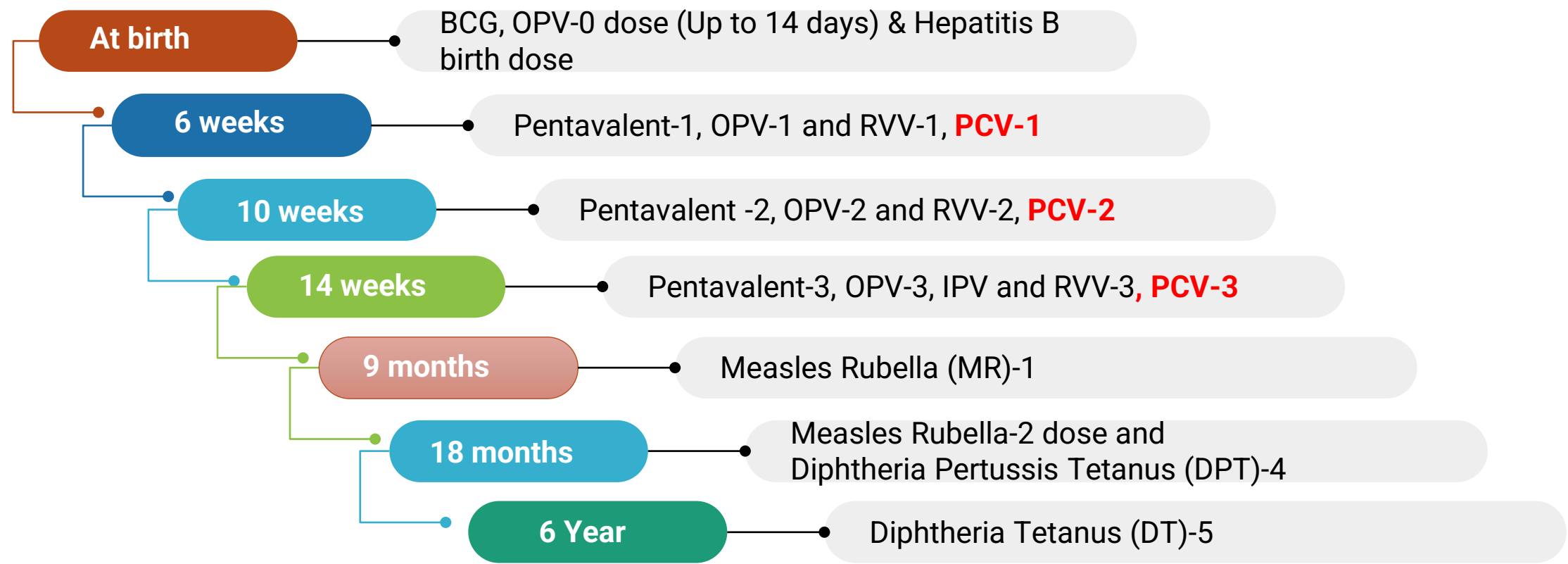
Bhutan and Timor-Leste had eliminated measles in 2017 and 2018 respectively, and now join Maldives and Sri Lanka to achieve elimination of measles and rubella by 2023, a flagship priority program of WHO South-East Asia Region.

History EPI Programme in Timor-Leste





Current immunization schedule in Timor-Leste

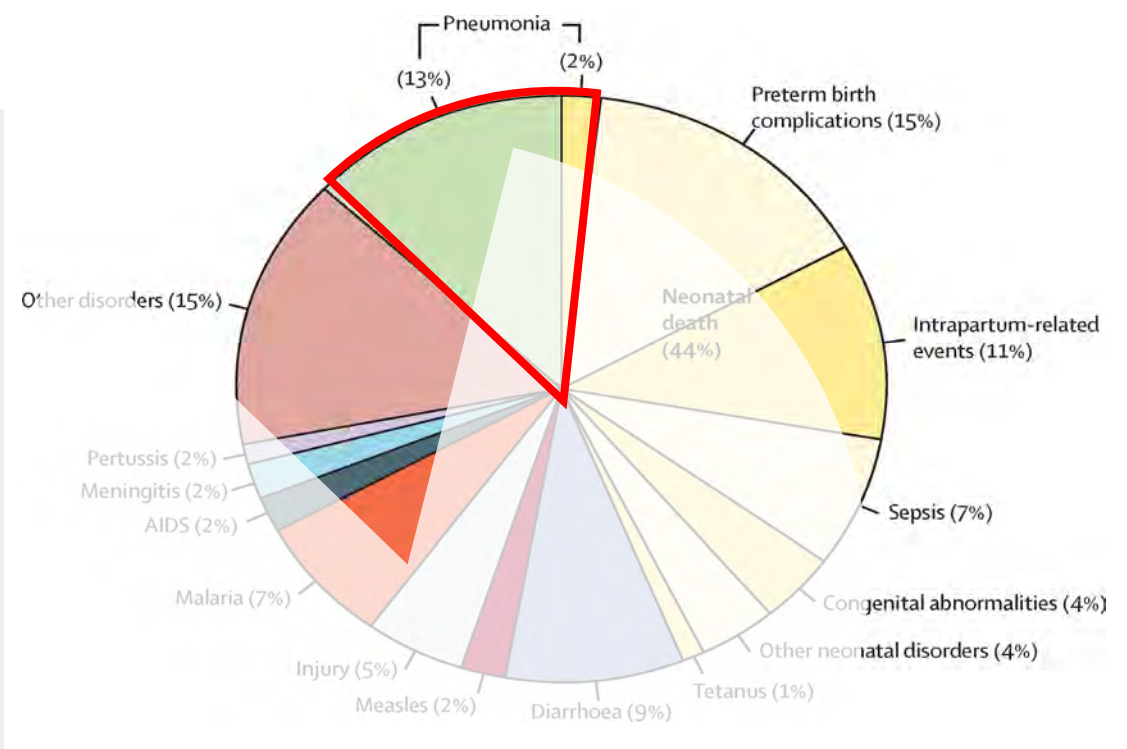




Background Pneumonia and malnutrition in Timor-Leste

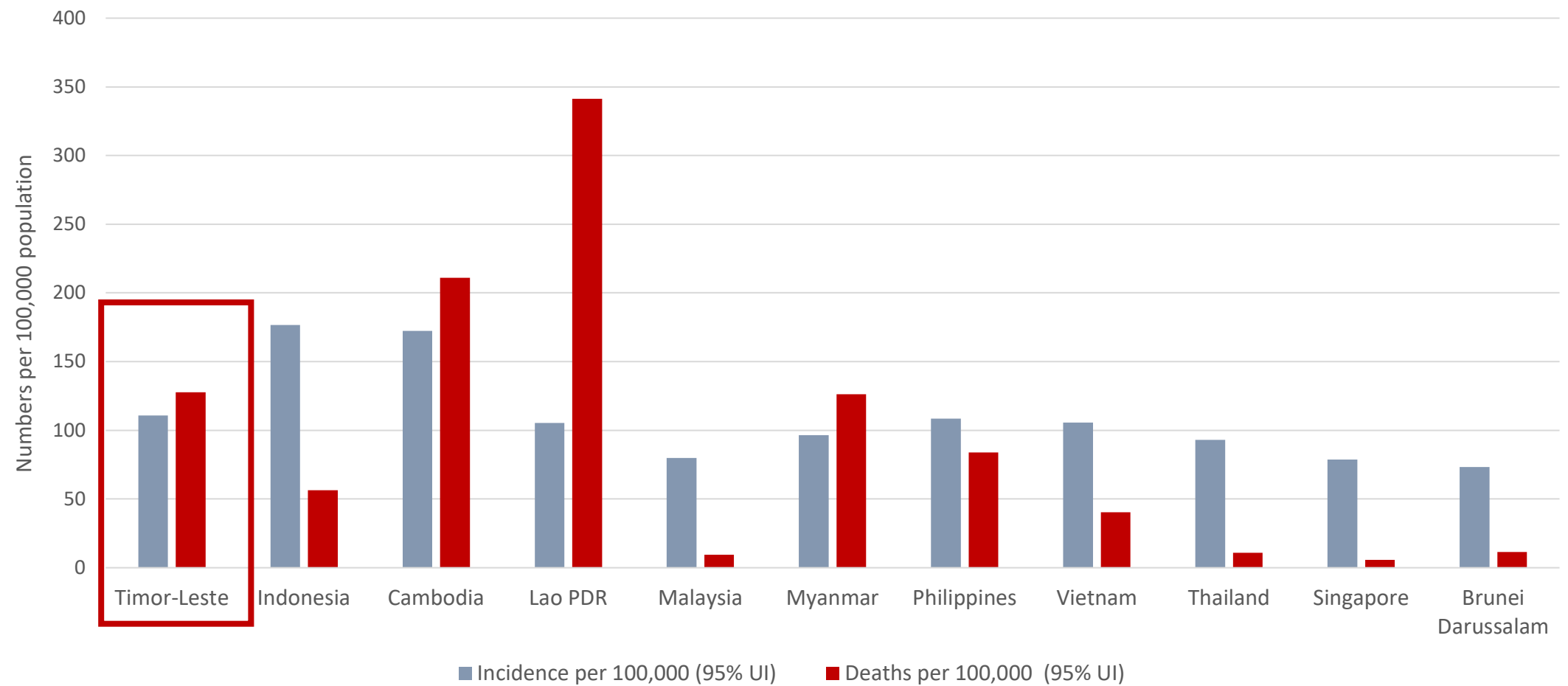
Background: Pneumonia mortality

	Value	Latest year with data	Progress towards global target
3.2.1 Under-five mortality rate (deaths per 1,000 live births)	42	2020	●
3.2.2 Neonatal mortality rate (deaths per 1,000 live births)	19	2020	●
3.3.1 (HIV Incidence) – New HIV infections per 1,000 uninfected population [Children <5]	0	2020	●
3.3.1 (HIV Incidence) – New HIV infections per 1,000 uninfected population [Adolescent GIRLS 15-19]	0	2020	●
3.3.1 (HIV Incidence) – New HIV infections per 1,000 uninfected population [Adolescent BOYS 15-19]	0	2020	●
3.1.1 Maternal mortality ratio (deaths per 100,000 live births)	142	2017	●
3.1.2 Proportion of births attended by skilled health personnel (%)	56	2016	●
3.7.2 Adolescent birth rate per 1,000 women	41	2015	●
3.8.1 Coverage of essential health services (index)	53	2019	●
2.2.1 Prevalence of stunting among children under 5 (%)	48	2020	●
2.2.2a Prevalence of wasting among children under 5 (%)	9	2013	●
2.2.2a Prevalence of overweight among children under 5 (%)	2	2020	●
3.b.1 Proportion of surviving infants receiving measles-containing-vaccine first-dose (MCV1) (%)	79	2020	●
3.b.1 Proportion of surviving infants receiving 3 doses of diphtheria-tetanus-pertussis (DTP3) (%)	86	2020	●



Source: L Liu et al. *The Lancet* 2015 385, 430-440 DOI: (10.1016/S0140-6736(14)61698-6)

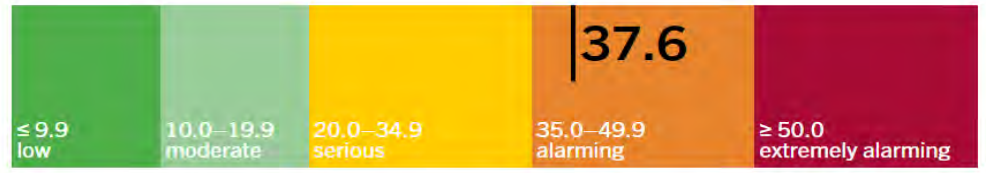
Background: Pneumonia in Children Under 5 in ASEAN Countries



Lower respiratory infection including pneumonia in children under five years in 2016

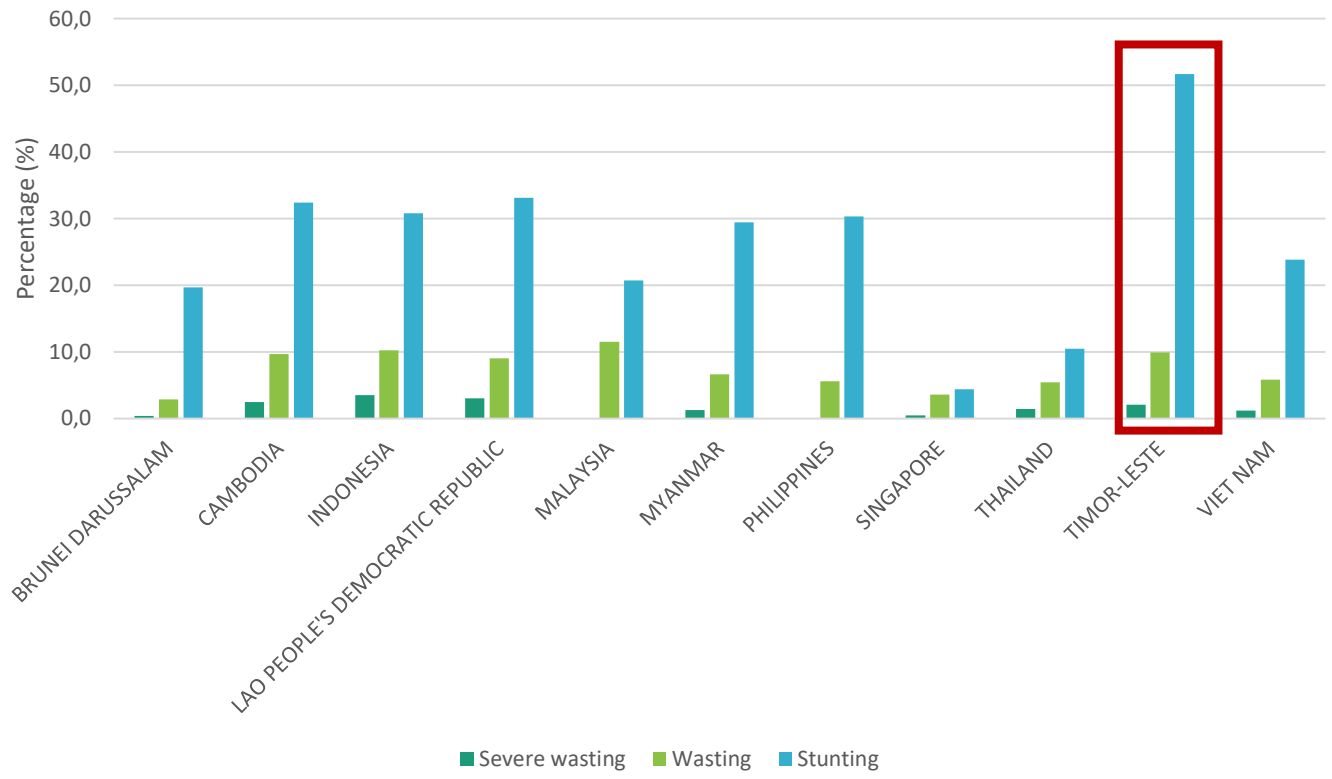
Troeger et al 2018. [http://dx.doi.org/10.1016/S1473-3099\(18\)30310-4](http://dx.doi.org/10.1016/S1473-3099(18)30310-4)

Background: Malnutrition in ASEAN Countries



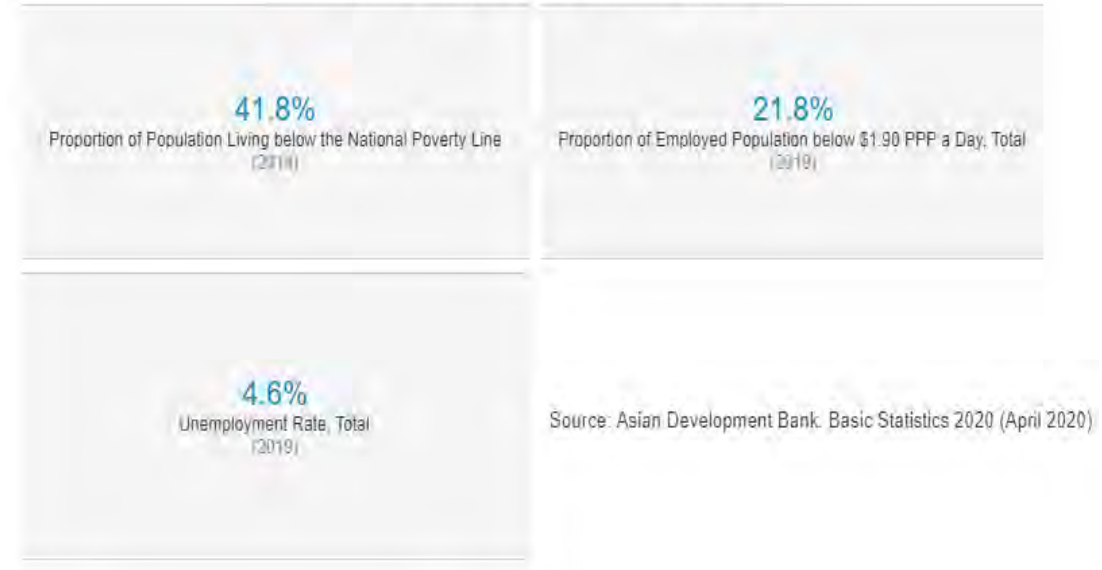
<https://www.globalhungerindex.org/timor-leste.html>

Prevalence of Undernutrition in Southeast Asian Countries



<https://data.unicef.org/topic/nutrition/malnutrition/>

Select Poverty Indicators: Timor-Leste



<https://www.adb.org/countries/timor-leste/poverty>



Background: Evidence from the National Hospital

ORIGINAL ARTICLE

Three years of paediatric morbidity and mortality at the national hospital in Dili, East Timor

Ingrid Kirsten Bucens,¹ Alison Reid,⁴ Aniceto Cardoso Barreto,¹ Vikas Dwivedi^{2*} and Megan Counahan^{3†}

¹Paediatrics, National Hospital Guido Valadares, ²TAIS, ³World Health Organization, Dili, East Timor and ⁴Western Australian Institute for Medical Research, University of Western Australia, Perth, Western Australia, Australia

ORIGINAL ARTICLE

Survey of childhood malnutrition at Dili National Hospital, East Timor

Ingrid K Bucens* and Carolyn Maclennan**

Dili National Hospital, Dili, East Timor

Lower Respiratory Tract Infection

2542/5909 (43%) admissions
 92/327 (28%) deaths

Malnutrition

280/880 (32%) admitted children malnourished.
 WHZ available 233/280
 HAZ available 227/280
 62% (144/233) had severe malnutrition and
 60.4% (137/227) were stunted



NITAG-TL PCV recommendation



NITAG-TL Technical Sub-committee on Pneumococcal Disease

- The Timor-Leste NITAG PCV-Subcommittee was established on 30 May 2019
- Dr Celia dos Santos as Pneumococcal Subcommittee Chair – continued with **Nevio Sarmiento** since April 2021
- Major role of this Subcommittee is to provide recommendations to the Ministry of Health on PCV introduction
- Three Subcommittee meetings held
 - Discuss and formulate the PCV recommendations
- Evidence-based decision-making workshop with NITAG members also undertook substantial work on PCV recommendations
- Recommendations drafted by Subcommittee with support from the National Centre for Immunisation Research and Surveillance (NCIRS), Menzies School of Health Research, UNICEF and WHO Timor-Leste Country Office



Vaccine schedule for Timor-Leste

- The WHO recommends the 2p+1 or 3p+0 schedule
- However, considering:
 - the higher vaccine coverage achieved at 6, 10 and 14 week
 - likely higher burden of disease in the 1st year of life compared to >1 year of age
- NITAG-TL recommends a 3p+0 schedule for Timor-Leste (changes may happen adjusted to any research output).



Vaccine schedule – Cont.....

- Protection^{1,2}
 - mixed evidence about if 3p+0 schedule provides better protection in first year of life compared to 2p+1
 - 2p+1 schedule may provide better longer-term protection due to higher antibody levels in the second year of life
- Currently 2 injections at 14 weeks of age (Penta3 & IPV)
 - Introducing PCV either as 3p+0 or 2p+1 into the routine immunization will mean a third injection at 14 weeks of age
 - 2p+1 schedule at 6 and 10 weeks and 9 months of age, to avoid a third injection at 14 weeks of age, not recommended because of lower antibody responses compared to when given at 6 and 14 weeks³

¹ WHO position paper 2019; ² Hamaluba et al. 2015 Lancet Infect Dis; ³ Kandasamy et al. Lancet Infect Dis 2019



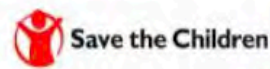
Vaccine schedule – Cont....

- Coverage highest for vaccines recommended at 6, 10 and 14 weeks of age
- Coverage is lower for measles-rubella vaccine, recommended at 9 months of age



Target population

- NITAG Timor-Leste recommends the target population for the routine PCV program to be all infants
- NITAG Timor-Leste recommends, if MoH or donor resources permits, to have catch-up vaccination at the time of introduction of PCV to accelerate its impact on disease in children aged 1–<5 years as recommended by WHO, with one dose of PCV vaccine



Pneumococcal carriage study

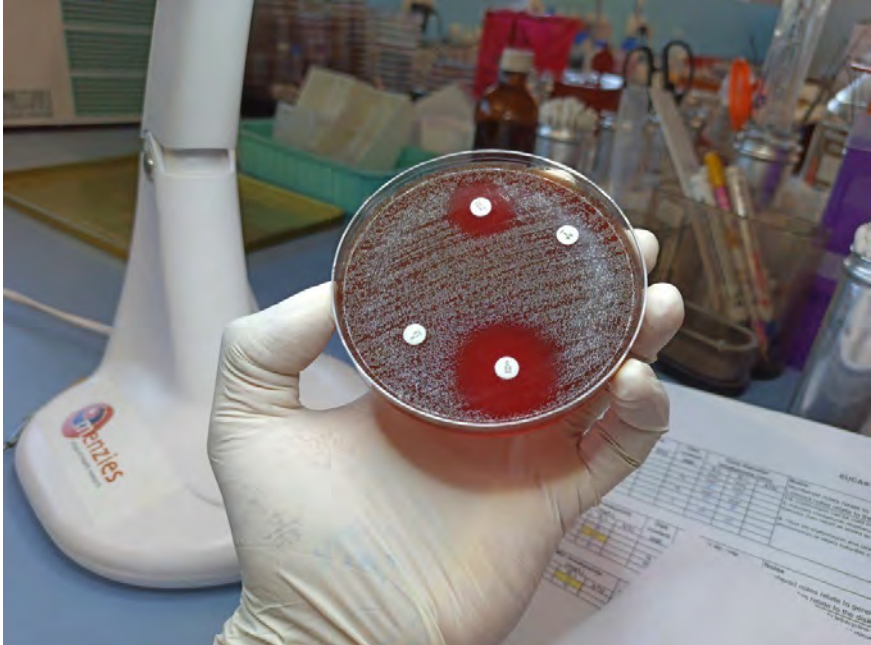
Hospital carriage study or *PULSA "Healthy lung Study"* (2019 – 2021) – completed



PULSA Study Patient recruitment from one of the wards in the Ped. Dept. HNGV



Hospital pneumococcal carriage laboratory work



Hospital serotyping for *S. pneumoniae*

Serotype identified from the study	6B	6C	9V	13	14	10A	11A	15A	15B	16B	16F	17F	18C	19A	19F	22F	23A	23B	23F	35B	35F	NT
Total identified	10	2	1	3	6	1	5	8	3	1	5	1	1	5	19	1	5	2	6	1	1	34
Serotypes matching Pneumosil (PCV10)	6B				14									19A	19F				23F			

Total *Streptococcus pneumoniae* **121/580 (21%)**
 Vaccine type **46/121 (38%)**
 Non vaccine type **41/121 (34%)**
 Non typeable **34/121 (28%)**



Pneumococcal carriage study

- Community carriage study – (2023) - ongoing



Rationale – current research project

- Lower carriage in hospitalised children
- Antibiotic exposure
- Thus, there is an identified need to understand baseline (pre-PCV) pneumococcal carriage rates in children without recent antibiotic use.

Serotyping of Pneumococcus at Microbiology Laboratory, Timor-Leste



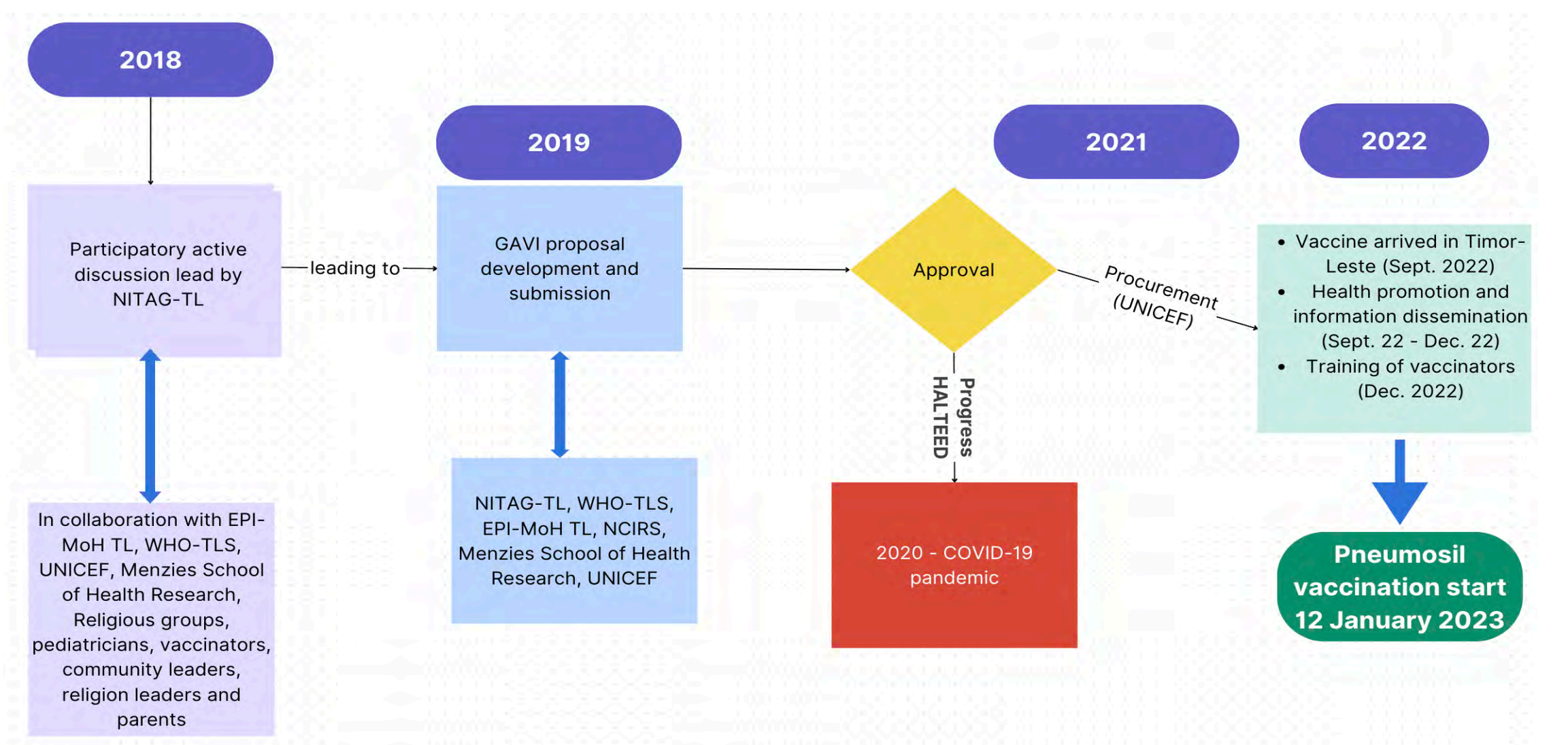
• Preliminary findings – Community carriage

- Carriage 40% (222/555)
- About 100 (45%) *Streptococcus pneumoniae* isolates has been serotyped
- Majority serogroups 6 no 14 which are covered in our PCV-10 (Pneumosil)
- Interestingly, we have identified serogroup 15 almost 25% (24/100) which is not covered in our Pneumosil vaccine type.
- This is preliminary findings. Once this study is concluded, will discuss with the stakeholders for the vaccine strategy or further studies.

Serotypes/serogrup identified	Serotype 4	Serogroup 6	Serogroup 7	Serogroup 9	Serogroup 10	Serogroup 11	Serotype 14	Serogroup 15	Serogroup 18	Serogroup 19	Serotype 20	Serogroup 23	Non-vaccine serotypes (NVS)	Non-Typeable (NT)
Total identified	3	50	1	3	4	6	14	21	1	32	2	19	33	11
Serotypes covered by Pneumosil (PCV-10) - 1, 5, 6A, 6B, 7F, 9V, 14, 19A, 19F, 23F		6A/6B		9V			14			19A/19F		23F		



Pneumosis Introduction



PNEUMOSIL®

Jump to: [Product overview](#) [Prequalification](#) [Product description](#) [Attachments](#) [Remarks](#)

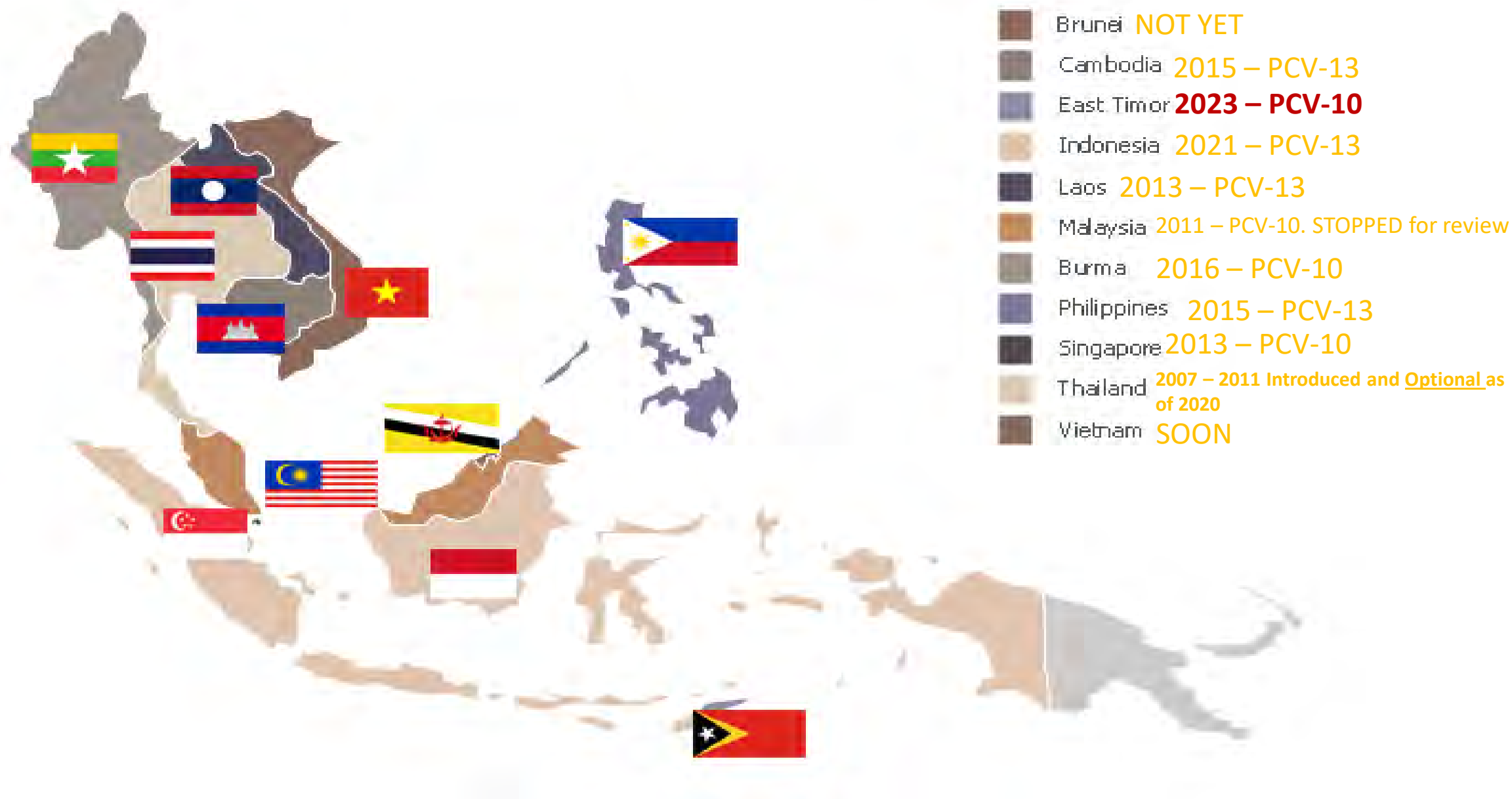


Product overview

Type:	Pneumococcal (conjugate)
Commercial Name:	PNEUMOSIL®
Manufacturer:	Serum Institute of India Pvt. Ltd.
Country:	India
URL:	http://www.seruminstitute.com/
Responsible NRA:	Central Drugs Standard Control Organization
Country:	India
URL:	www.cdsc.nic.in
Bulk Supplier:	Not applicable

Idade	Vasina atual	Vasina foun
Semana 6	OPV1, Rotavirus 1, Pentavalent 1 (DTP-HepB-Hib)	PCV doze 1
Semana 10	OPV2, Rotavirus 2, Pentavalent 2 (DTP-HepB-Hib)	PCV doze 2
Semana 14	OPV3, Rotavirus 3, Pentavalent 3 (DTP-HepB-Hib), IPV	PCV doze 3

PCV STATUS in ASEAN COUNTRIES









LANSAMENTU KAMPAÑA NASIONAL INTEGRADU

Labarik tinan 5 mai kraik:

- Introdusaun Vaxina Pneumococcal
- Imunizasaun Sarampu, Rubela, no Polio
- Vitamina A
- Ai-moruk Kontra Lombriga

Tinan 12 ba leten:

- Vasinasau COVID-19:
- Doze 1
- Doze 2
- Doze booster ba idade 18 ba leten.

12 Janeiru 2023 to'o 28 Feveiru 2023

Iha fasilidade saude ka postu kampaña ne'ebe determina husi Ministeriu Saude.





House to house and farm sweeping

Photo credit: Ministry of Health, Timor-Leste and SABEH





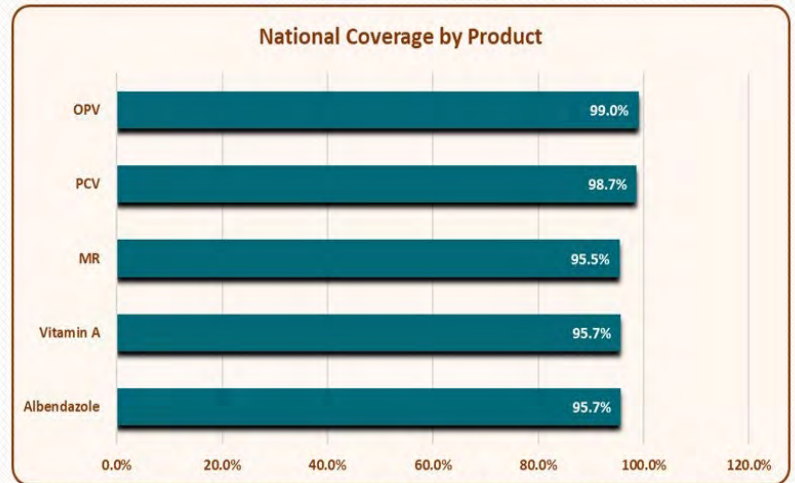
SIA Campaign 2023 Timor-Leste



Total number of doses given and Coverage as of 27/03/2023 14.00 hrs among target groups

Municipality	OPV			PCV			MR			Vitamin A			Albendazole		
	Target	Doses Given	Coverage	Target	Doses Given	Coverage	Target	Doses Given	Coverage	Target	Doses Given	Coverage	Target	Doses Given	Coverage
Aileu	6,396	7,203	112.6%	6,321	7,066	111.8%	5,625	6,162	109.5%	6,182	6,436	104.1%	5,435	5,888	108.3%
Ainaro	6,897	6,872	99.6%	6,724	6,712	99.8%	5,852	5,746	98.2%	6,203	6,069	97.8%	5,504	5,428	98.6%
Atauro	1,150	1,127	98.0%	1,134	1,097	96.7%	1,001	972	97.1%	1,122	1,010	90.0%	897	912	101.7%
Baucau	13,450	16,296	121.2%	13,177	15,774	119.7%	12,644	14,266	112.8%	12,165	14,781	121.5%	11,727	13,761	117.3%
Bobonaro	10,199	11,920	116.9%	9,909	11,528	116.3%	8,779	10,043	114.4%	9,314	10,587	113.7%	8,404	9,623	114.5%
Covalima	7,982	8,261	103.5%	7,801	8,044	103.1%	6,836	6,850	100.2%	7,184	7,149	99.5%	6,388	6,563	102.7%
Dili	54,076	53,946	99.8%	52,105	51,925	99.7%	46,401	44,529	96.0%	48,850	46,377	94.9%	44,189	41,536	94.0%
Ermera	20,499	23,030	112.3%	19,269	21,992	114.1%	18,387	19,549	106.3%	18,722	20,150	107.6%	17,229	18,608	108.0%
Lautem	7,453	8,572	115.0%	7,338	8,418	114.7%	6,760	7,295	107.9%	6,936	7,567	109.1%	6,358	6,837	107.5%
Liquica	10,620	10,684	100.6%	10,352	10,281	99.3%	9,027	8,870	98.3%	9,545	9,345	97.9%	8,500	8,331	98.0%
Manatuto	5,518	5,857	106.1%	5,408	5,638	104.3%	4,800	5,012	104.4%	5,049	5,241	103.8%	4,584	4,779	104.3%
Manufahi	7,796	7,788	99.9%	7,616	7,538	99.0%	6,625	6,671	100.7%	7,019	6,930	98.7%	6,237	6,260	100.4%
Viqueque	9,499	9,871	103.9%	9,300	9,614	103.4%	8,165	8,499	104.1%	8,614	8,816	102.3%	7,727	8,013	103.7%
ZEEMS (Oecusse)	6,728	7,319	108.8%	6,573	7,021	106.8%	5,719	5,985	104.7%	6,053	6,440	106.4%	5,384	5,700	105.9%
Total	168,263	178,746	106.2%	163,027	172,648	105.9%	146,621	150,449	102.6%	152,958	156,898	102.6%	138,563	142,239	102.7%

*Denominators are based on estimated and enumerated targets provided by respective municipality directors



*Denominators are based on estimated and enumerated targets provided by respective municipality directors



Date and time prepared: 06 March 2023, 02.00 pm
Source: TLHIS





Lesson learned

- Know your own disease burden and act fast
- High burden of lower respiratory tract infection
- Data is important, research is important but saving lives comes first.
- Give children the chance to survive (20% population in TL are under 5)
- Political will and personal commitment
- Open and collaborate with international partners



Next plan

- Expanded Program of Immunization (EPI) Review – October 2023
- GAVI Post-transitional plan proposal 2023 – 2025.
- PCV vaccine impact study – One-year post-introduction carriage survey – Proposal drafted.
- RCT of Pneumosil in malnourished children – Australian NHMRC Grant approved and will be led by Dr Nicholas Fancourt (John Hopkins Bloomberg SPH doctorate graduate)
- Review of Pneumosil schedule. Trial of 1+1 vs 3+0 (immune response) – Looking for funding
- Continue rolling out Pneumosil as routine immunization in health centers including doing house to house sweeping

Acknowledgement



Merci
Beaucoup
(OBRIGADO)



PCV SIA Coverage

Age Category (Months)	Total	PCV Vaccinated in SIA	
		n	%
6 weeks-11	166	143	86.1
12-23	205	151	73.7
24-35	260	188	72.3
36-47	265	178	67.2
48-60	302	226	74.8
Total	1198	886	74.0

Sex	Total	PCV Vaccinated in SIA	
		n	%
Female	580	434	74.8
Male	618	452	73.1
Total	1198	886	74.0

Municipality	Total	PCV coverage in SIA	
		n	%
Aileu	57	51	89.5
Ainaro	74	44	59.5
Atauro	12	11	91.7
Baucau	111	68	61.3
Bobonaro	97	84	86.6
Covalima	73	62	84.9
Dili	267	172	64.4
Ermera	132	94	71.2
Lautem	52	38	73.1
Liquica	96	77	80.2
Manatuto	53	43	81.1
Manufahi	51	43	84.3
Oecusse	51	39	76.5
Viqueque	72	60	83.3
Total	1198	886	74.0