



Establishment of L3 (field reference laboratory)

L3 field reference laboratory was a collaboration of the Indonesian National Institute of Health Research and Development (NIHRD), US Naval Medical Research Unit No.2 (NAMRU-2) and the Aceh provincial bealth laboratory (Labkesda Aceh) to anticipate post tsunami emerging infectious diseases outbreaks in Aceh Province, Indonesia.

Due to structural damage, decimation of skilled laboratory staff, and loss of critical supplies, laboratory capabilities after 26 December were essentially nil in Banda Aceh, the city centre of Aceh Province. On 15 January 2005, staff from NIHRD and NAMRU-2 were jointly given the task of establishing a reference laboratory on the grounds of the Aceh provincial health laboratory unit (Labkesda Aceh) in response to the direct need for laboratory resources. This reference laboratory, known as L3, was funded by USAID.

The laboratory was initially staffed and supplied to process a wide spectrum of specimens, including overflow of clinical specimens from the public health laboratory, internally displaced persons (IDP) camps, and the large public hospital located 200 metres away, Zainoel Abidin Hospital.

Within 10 days of preparation, the L3 lab was processing basic microbiology specimens and performing wet and dry chemistry, complete blood counts and parasitology examinations (blood and stool smears). Within the next 2 weeks, the laboratory was performing serology for many infectious disease threats,



Only house still standing.

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including dengue, leptospirosis, viral hepatitis, and influenza.

In addition to laboratory processing, the laboratory supervisor provided assistance with interpretation of results, supplies and advice for specimen collection and, when applicable, clinical consultation. Findings of public health importance were reported both to Aceh provincial health department and the World Health Organization (WHO) on a daily basis. A summary of all laboratory results was also reported to WHO, non-governmental organisations, the local ministry of health, NIHRD and other stakeholders at the weekly epidemiology meeting chaired by WHO.

Although the focus of the first phase of L3 lab operations was broad in scope and varied depending upon daily urgent needs, the ultimate goal was to perform confirmatory diagnostics for specimens of public health significance. In order to narrow the laboratory scope, emphasis was placed on capacity building and cross-training.

Cultural barriers and nationalistic tendencies led to initial resistance in assistance with training of new staff, donation of supplies and cross-checking results for quality assurance. Techniques employed to make assistance more acceptable included:

- Diversion of all specimens to Labkesda Aceh as soon as they were capable of processing them.
- Having the L3 lab and Labkesda Aceh lab run specimens in tandem to avoid the L3 lab being perceived as the 'gold standard'.
- Sending L3 staff to train public health lab staff in their own facilities, alleviating discomfort of working with unfamiliar equipment. This also indirectly facilitated assessment of the public health lab equipment and capabilities.
- Diffusing tensions by coordinating efforts through other collaborating organisations such as WHO.

Three months after the L3 lab began processing specimens, NIHRD became the lead agency, with NAMRU-2 only assisting as needed. The L3 lab continued to heavily support Labkesda Aceh until May 2005. Since then, the L3 lab has assumed its intended role, and is primarily evaluating specimens referred for confirmation in the setting of a public health urgency/ emergency. L3 staff continue to provide training and support of Labkesda Aceh as needed.



ELISA testing.



Plating.

In Focus



 Table 1.
 Summary of public health-relevant organisms identified by NAMRU-2/Litbangkes Laboratory, Aceh Province, January-April 2005.

Organisms with outbreak potential				
Organism	Specimen type	Test performed	No. identified	Drug susceptibility
Parasites (total specimens submitted = 117)				
Plasmodium falciparum	Blood smear		4*	
Plasmodium vivax	Blood smear		1	
Entamoeba histolytica	Stool		4	
Giardia lamblia	Stool		1	
Viruses (total specimens submitted = 107)				
Rubeola	Serum	ELISA	5	
Rubella	Serum	ELISA	9	
Dengue	Serum	ELISA	11	
Hepatitis A	Serum	ELISA	6	
Hepatitis E	Whole blood/serum	Rapid test	7†	
Orientia tsutsugamushi	Serum	ELISA	6	
Bacteria (total specimens submitted = 155)				
Burkholderia pseudomallei	Sputum		1	
Shigella flexneri	Stool		7	
Salmonella C2	Stool		1	
Mycobacteria (total specimens submitted = 55)				
Mycobacterium spp. §	Sputum		13	
Highly drug resistant bacteria				
Acinetobacter baumanii	Sputum		4	Amikacin and Imipenem
Klebsiella pneumoniae	Sputum		1	Imipenem

* 2 specimens with gametocytes only

† all weak positive, confirmatory ELISA not performed

§ presumed M. tuberculosis (culture/PCR confirmation unavailable)