

# Lao – Lux lab / Vaccine preventable diseases 2022-2023

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## Executive summary

The Vaccine-preventable disease (VPD) laboratory has a remit to build capacity for investigations of human and animal infectious diseases that are of relevance for Lao PDR. Our activities are in collaboration with the Clinical and Applied Virology group at the Luxembourg Institute of Health (LIH), Luxembourg, headed by Judith Hübschen. We work closely with local partners and focus on the epidemiology and seroprevalence of vaccinepreventable infectious diseases, as

well as animal and zoonotic diseases. As such, we can provide stakeholders in public and animal health with estimates of the burden of infections, promote outbreak control and vaccination programmes, and propose measures to optimize national health strategies. Our evidence-based results and recommendations are communicated to stakeholders and partners in the form of written and oral reports and policy briefs.

We previously reported an unprecedentedly high level of hepatitis C virus infection in Saravan province in the south of Laos. In this report we detail a follow-up study done in 2022 in Saravan province to determine risk practices that are associated with hepatitis C virus infection in the district of Samuoi. We identified several risk practices and suggest ways to mitigate them. We also strongly recommend extensive testing and treatment for hepatitis C in Saravan and the surrounding area. This study was done in collaboration with Center Infectiology Lao-Christophe Mérieux (CILM) and the Lao Tropical and Public Health Institute (LTPHI), as well as the local healthcare workers in Saravan province. The findings were written as a policy brief and distributed to policy makers such as the WHO and the Lao department of communicable disease control (DCDC). A meeting was organised to present the data to WHO, Lao DCDC and other partners in June 2022 and the data have been accepted for publication. In collaboration with CILM and LTPHI, we co-supervised a Master's student who investigated the compliance of hepatitis C virus infected individuals identified in the study to anti-viral medication. These individuals were provided with a curative three-month course of direct acting antivirals

and were monitored for factors impacting adherence and their cure rate. The results of the compliance study will be reported in the future.

In this year's report, we also describe two of our other collaborative studies that were published in 2022. In one, we determined the susceptibility of the population of Xaysomboun

to VPD. This province has some of the poorest health indicators nationwide and we found a low level of protective antibodies against hepatitis B, measles and tetanus, particularly in the younger participants. These data suggest a need to provide booster vaccine doses to these infections during childhood and adolescence. We also report data from a study that was done in Lao children and adolescents to look at the seroprevalence of Haemophilus influenzae serotype b (Hib), a bacterial infection that can cause pneumonia and meningitis in young children. The effective vaccine against Hib was introduced into Laos in 2009 and we present data showing the presence of antibodies – i.e. circulation of Hib – in unvaccinated individuals. The results indicate that surveillance to detect Hib within the Lao population is warranted in order to determine the true burden of disease.

Vilaysone Khounvisith from the laboratory visited the Swiss Tropical and Public Health Institute in Basel from September to December, as part of her PhD. Whilst there she took courses in biostatistics, parasitology and One Health and met and discussed with her PhD cosupervisor, Professor Peter Odermatt.

From September we were joined by Souksanh Sihuksa in the framework of the Arboshield program.

## **Publications in 2022**

*High exposure to hepatitis C virus in Saravan, southern Laos; identification of several risk practices.* Black AP, Virachith S, Khounvisith V, Hefele L, Paboriboune P, Hübschen JM. Lancet Reg Health West Pac, In Press.

*Hepatitis B virus and other transfusion-transmitted infections in child blood recipients in Lao People's Democratic Republic: a hospital-based study.* Khounvisith V, Saysouligno S, Souvanlasy B, Billamay S, Mongkhoun S, Vongphachanh B, Snoeck CJ, Black AP, Muller CP, Hübschen JM. Arch Dis Child, In Press.

*Haemophilus influenzae* serotype b seroprevalence in central Lao PDR before and after vaccine introduction. Hefele L, Lai J, Vilivong K, Bounkhoun T, Chanthaluanglath V, Chanthongthip A, Balloch A, Black A.P. Hübschen JM, Russell FM, Muller CP. Plos One, Sept 2022.

*Knowledge, attitude and practice towards liver cancer and liver cancer screening among HBV and HCV patients in Vientiane, Lao People's Democratic Republic: a cross-sectional study.* Cheung D, Khounvisith V, Sitbounlang P, Douangprachanh S, Virachith S, Arounlangsy P, Hübschen JH, Paboriboune P, Black AP. Journal of Clinical and Experimental Hepatology, March 2022.

*Susceptibility to Vaccine-Preventable Diseases in Four Districts of Xaysomboun Province, Lao People's Democratic Republic.* Virachith S, Lao M, Inthepphavong M, Inthalath S, Hübschen JM, Kounnavong S, Sayasone S, Black AP. Vaccines, March 2022.

*An unexpectedly high prevalence of hepatitis C virus infection in southern Lao People's Democratic Republic with unidentified infection sources and risk factors.* Black AP, Khounvisith V, Xaydalasouk K, Sayasinh K, Sausy A, Muller CP, Hübschen JM. Emerging Infectious Diseases, Jan 2022.

#### Meetings and presentations

The 10<sup>th</sup> Asian Conference of Pediatric Infectious Diseases (ACPID). Seoul, Korea. October 26-28. "Low seroprotection against diphtheria and tetanus in Lao adolescents" poster presentation by Siriphone Virachith (young investigator award recipient).

Developing an Operational Guide to assist countries in collecting monitoring and evaluation indicators for viral hepatitis, 26-27 July 2022. "Hepatitis B and C virus studies in Lao PDR" oral presentation by Siriphone Virachith.

Stakeholder meeting at Lao Ministry of Health. "*Hepatitis C risk practices*" Oral presentation by Phimpha Paboriboune (CILM) and Antony Black.

### **Training is given by vaccine-preventable disease lab staff**

Training of provincial military staff on vaccine preventable diseases, February; Phonethipsavanh Nouanthong (consultant).

Teaching basic vaccinology for Master of Public Health students, Lao University of Health Sciences, April and August; Phonethipsavanh Nouanthong (consultant).

On-the-Job Training and lectures at IPL for Military personnel under the "Arboshield plus" project (DTRA): Biosafety and Biosecurity; General Biology; Basic immunology; February; Siriphone Virachith lecturer.

Module on Viral Hepatitis, Lao Tropical and Public Health Institute, May; Siriphone Virachith and Antony Black lecturers.

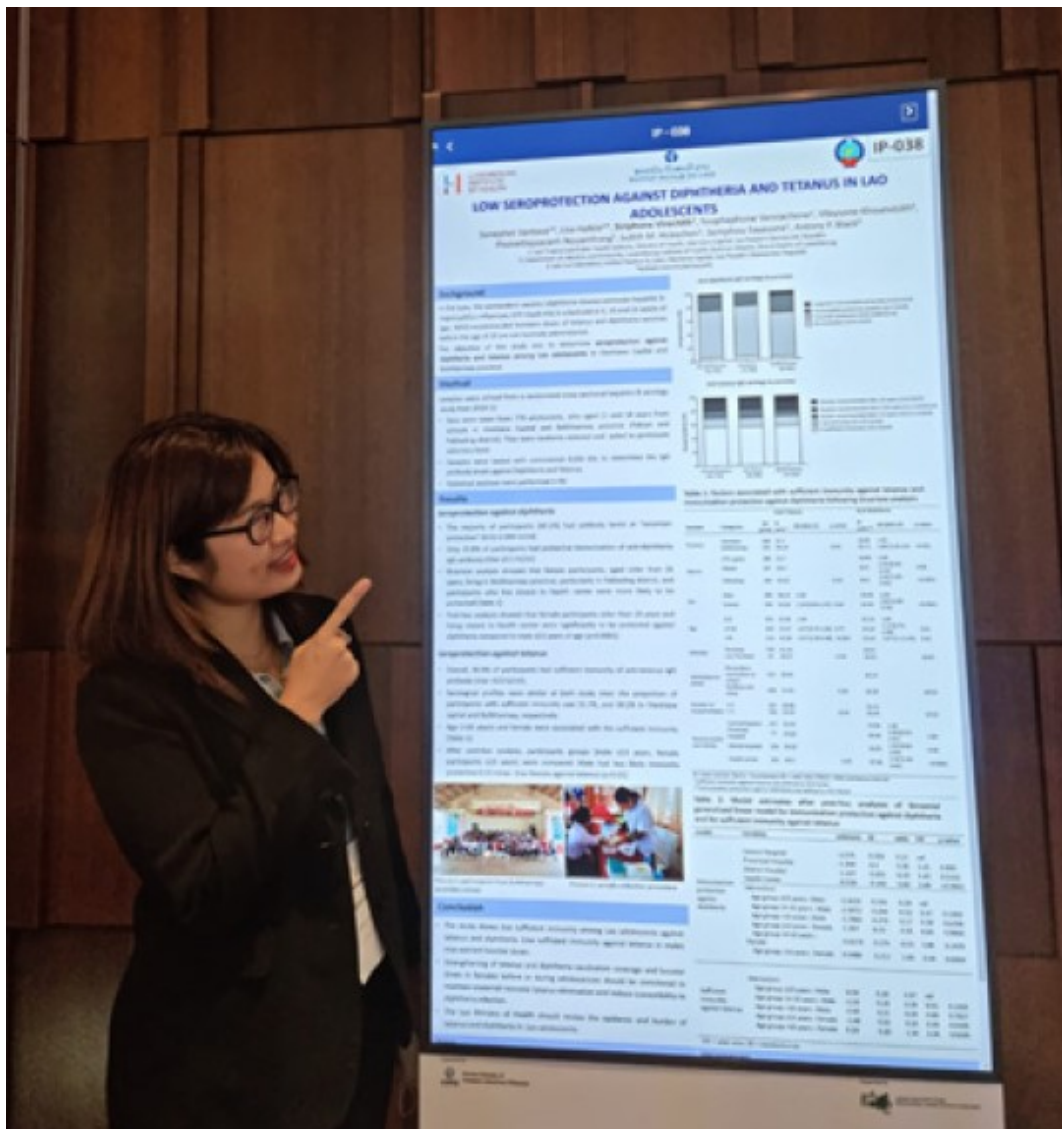
Training of national regulation on biosafety and biosecurity for laboratory technicians (Northern hospitals), August and September; National training and accreditation for biosafety and biosecurity for Lao technicians, September 2022; Siriphone Virachith lecturer and facilitator.

Co-supervision of Douangsamai Akkhasith from LTPHI for her Master's research thesis; "Adherence to Direct Acting Antiviral combination of Sofosbuvir/Velpatasvir for treatment of Hepatitis C virus infection among adults in Samoui district, Saravan province, Southern Lao PDR."; Antony Black and Siriphone Virachith

### **Training is undertaken by vaccine-preventable disease lab staff**

"Laboratory quality management course" Luang Prabang, 3-7<sup>th</sup>

October, Nouna Innoula. "IATA course" Vientiane, 14<sup>th</sup> October, Bounta Vongphachanh.



Siriphone Virachith (young investigator award winner) presenting her poster at the 10th Asian Conference of Pediatric Infectious Diseases, Seoul, Korea.



Vilaysone Khounvisith at the Swiss Tropical Public Health Institute, Basel, Switzerland (PhD training from September – December)

**Scientists:**

Dr. Siriphone Virachith, MD, PhD

Junior Scientists:

Dr. Vilaysone Khounvisith, MD

**Technicians:**

Latdavone Khenkha

Bounta Vongphachanh

Nouna Innoula

**Project carried on in the lab**

+High exposure to hepatitis C virus in Saravan, southern Laos; identification of several risk practices.

+*Haemophilus influenzae* serotype b seroprevalence in central Lao PDR before and after vaccine introduction.

+Susceptibility to vaccine-preventable diseases in four districts of Xaysomboun Province, Lao People's Democratic Republic.