

Terms of Reference

Background:

Dengue fever is the most important arboviral virus in the world as over 2.5 billion people in about 100 countries are at risk of infection. In Cambodia, waves of Dengue epidemics have been recorded since the early 80's. Over 42,000 suspect dengue cases have been reported in 2012 through the public sector surveillance systems. Economic development and rapid urbanization, as well as easier, cheaper and faster long distance transport of human and animals dramatically increased across the South East Asian region. This phenomenon, particularly marked along the main roads, is prone to favor vector-borne diseases transmission and to increase disease burden for local populations.

The ECONomic Development, ECOSystem MODifications and Emerging Infectious Diseases Risk Evaluation (ECOMORE) project is a 3-year project aiming to stimulate and federate national collaborations to strengthen the Cambodian surveillance capacity on emerging vector-borne diseases. In the context of this project that started in March 2013, dengue epidemiological surveillance has been strengthened in Cambodia. Detailed geographical and economic data describing for example road use have also been collected.

Mission:

Relying on these new epidemiological, geographic and demographic data sets that describe the spatial distribution of dengue cases along with human mobility, we aim to describe the spatial-temporal patterns of dengue propagation in Cambodia, ii) characterize the factors that shape the long-range spatial spread of dengue in Cambodia and iii) assess whether the recent and rapid development of roads modified the spread of dengue in the country.

Scope of work:

The consultant will:

- Develop mathematical and statistical models describing the spatial-temporal spread of dengue in Cambodia.
- Integrate data documenting the recent and rapid road developments and use and other factors to the model.
- Ascertain whether these factors may explain the epidemiology of dengue-like syndromes and confirmed dengue cases in Cambodia.

Supervision and work environment:

The consultant will be based in Institut Pasteur du Cambodge (IPC) in Phnom Penh, Cambodia.

INSTITUT PASTEUR DU CAMBODGE

Working for health in the heart of Cambodia

Institut Pasteur in Cambodia was created in 1953 to contribute to the diagnosis and study of infectious diseases and to their prevention, in close partnership with the country's public health authorities.

Institut Pasteur in Cambodia employs 170 people including 10 expatriate and 35 Cambodian medical doctors, pharmacists, veterinarians and researchers.

Promoting science and medicine in the service of populations

Services and support towards public health

- Biomedical laboratory (blood biology, bacteriology, mycology, parasitology)
- International vaccination center (pediatric and adult)
- Rabies vaccination center (prevention and post-exposure)
- Food microbiology and water analysis laboratory
- Voluntary confidential counseling and HIV testing clinic
- National reference centers for influenza, rabies, dengue...
- Identification of infectious agents and drug-resistances

Research

Fundamental research laboratories dedicated to infectious diseases apply their results to clinical medicine and provide innovative solutions for public health

Virology

- Emerging pathogens, and those responsible for A(H5N1) avian flu, influenza and other respiratory diseases, dengue, Chikungunya and Japanese encephalitis, HIV/AIDS, hepatitis, rabies, encephalitis, viral hemorrhagic fever

Bacteriology

- Mycobacteria, respiratory and enteric bacteria, multiple resistance to antibiotics

Parasitology

- Malaria : diagnostic, treatment and drug resistance

Epidemiology

- Operational epidemiology research
- Clinical research
- Surveillance and investigation of infectious diseases

Expertise and training

- Continuing education of national scientists at Institut Pasteur in Cambodia to ensure the future
- Participation to Master and PhD programs (in Cambodia and abroad)
- Organization of seminars, scientific conferences and post-graduate education
- Expertise and advice to Cambodian and international health authorities

The consultant will work under the co-supervision of Dr Arnaud Tarantola (Head of the Epidemiology Unit of Institut Pasteur du Cambodge) for epidemiological aspects and Dr Simon Cauchemez (Head of the Mathematical Modelling of Infectious Diseases Unit, Institut Pasteur Paris) for technical questions. He will closely collaborate with the epidemiologist dedicated to ECOMORE project, Mrs. Julia Ledien. The consultant will visit Dr Cauchemez's group in Institut

Pasteur Paris to work on model development. Details on Dr Cauchemez's research can be found at the following address: <http://www.pasteur.fr/en/research/infection-epidemiology/units-groups/mathematical-modelling-infectious-diseases>.

Skills and experience:

- Post-doctoral Researcher
- Expertise in the mathematical modelling of infectious diseases.
- Expertise in fitting mathematical models to epidemic data with methods such as Bayesian Markov chain Monte Carlo algorithms, data augmentation approaches or Sequential Monte Carlo algorithms.
- Experience in developing mathematical models to describe spatio-temporal dynamics of spread of pathogens in human populations.
- Experience in working on arboviruses.
- Experience in collaborating with Institutions in developing countries, for example within the international network of Pasteur Institutes.

Assignment: The consultant will be based in Phnom Penh.

Attached to: Institut Pasteur du Cambodge

Duration: 12 months_ from 01 May 2015 to 31 April 2016

Contract: Net salary 2,000€/month + full package (insurances...) + 3 return tickets Paris-Phnom Penh + 5% short-term contract bonus

Application Process:

Qualified applicants should submit their CV along with a cover letter, in English, by 15 March 2015. Kindly submit your full application to Maud Seguy, maud.seguy@pasteur.fr

Only shortlisted candidates will be contacted.