



**18th International Course on Dengue and other emerging Arboviruses.  
August 19-30, 2024 IPK, Havana, Cuba**

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**18th International Course on Dengue and other Emergent Arboviruses**

**19 – 30 August 2024**

**Instituto de Medicina Tropical “Pedro Kouri”**

**La Habana, Cuba**

**SUMMARY**

In 2024, the World Health Organization, WHO, warns of the global dengue situation. Only in the Region of the Americas, more than 11 million cases were reported with more than 17 000 severe cases and more than 6000 fatalities. The four serotypes circulate in the region with co-circulation of 2, 3 and 4 serotypes in several countries. The cases of Chikungunya Fever have been gradually increasing with the report of a serious epidemic in Paraguay in 2023. Although the numbers of Zika Fever cases remain low, its increase in the future is not ruled out. At the end of 2023, an outbreak of Western Equine Encephalitis was reported in Argentina and Uruguay. Finally, reports of cases of Mayaro and Oropouche are becoming more frequent every day with the confirmation in May 2024 of the first outbreak of Oropouche Fever in Cuba.

In this epidemiological scenario, the PAHO/WHO Collaborating Center for the Study of Dengue and its Control, the “Pedro Kouri” Institute of Tropical Medicine, the Cuban Society of Microbiology and Parasitology, the Ministry of Public Health of the Republic of Cuba, the Pan American Health Organization/World Health Organization, organized the 18th edition of the International Course on Dengue and other emerging Arboviruses for updating and preparing for new epidemiological arbovirus emergencies.

The course offered a space for updating and discussing the epidemiological situation and advances in the knowledge, prevention and control of Dengue and other arboviruses with special reference to Chikungunya, Zika, Yellow Fever, Mayaro and Oropouche.

Participants updated on topics such as the global epidemiological situation of the main arboviruses of medical importance to humans, the clinical picture, laboratory diagnosis, status of vaccines and antivirals development, new control tools, surveillance, response



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to emergence, influence of climate change and new international initiatives to mitigate its effects, among others.

On this occasion, the course was dedicated to the 87th Anniversary of the Institute of Tropical Medicine, “Pedro Kouri,” IPK.

Auspices: the Cuban Society of Microbiology and Parasitology (SCMP), the Pan American Health Organization (PAHO)/World Health Organization (WHO), the American Society of Tropical Medicine, the Center of Genetic Engineering and Biotechnology (CIGB), the Center for Immunoassay (CIE), the European Society for Clinical Microbiology and Infectious Diseases (ESCMID), the Institute of Tropical Medicine IMT in Belgium, the Neglected Tropical Diseases Program (NTDP/WHO), the Special Program for Research and Training in Tropical Diseases (TDR), the ZIKAlliance project, MEDICC among others.

During the theoretical course (19 to August 23), 22 conferences, 10 round tables, 6 symposia and a panel were given (tables 1 and 2).

For the practical activities (August 26 to 30), participants were organized into 6 groups: Vectors-Entomology, Clinical/Pathology, Epidemiology, Social Determinants-Community Participation, Molecular Diagnosis and Bioinformatics of dengue (this last topic imparted for the first time in the course).

The epidemiology practical group worked on the identification of hot spots, early warning systems, temporal data analysis for planning interventions, integration of information for geospatial analysis of epidemics, role of human mobility in the epidemics dispersion, cost-effectiveness studies of interventions among other topics.

The group of social determinants and community participation worked on social communication and community participation in the prevention of arboviruses, social vulnerability related to health and transmission of arboviruses, geospatial analysis in the prevention of arboviruses.

The group of Virology worked in the molecular methods for diagnosing arboviruses and particularly dengue, Zika, chikungunya, Mayaro and Oropouche.



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The Dengue Bioinformatic group worked on genomic surveillance for the study of dengue outbreaks, theoretical and practical exercises for phylogeny and viral evolution studies.

The group of clinic/pathology worked on the clinic of dengue, Zika, chikungunya and Oropouche, differential diagnosis, usefulness of dengue warning signs, complications of chikungunya infection, arbovirus infections in pregnant women, clinical management of dengue in children and adults, organization of health services in emergence situations.

The practices in the Entomology-Vector Control group included the taxonomic identification of arbovirus vectors, resistance and susceptibility studies to insecticides, the performance of control programs in several countries, the usefulness of the Sterile Insect Technique in the control of *Aedes aegypti*, use of entomovirological surveillance among other important topics.

Participants from 5 countries (Brazil, Cuba, Dominican Republic, Peru, Spain) presented their results at the poster session on August 21 and 22. 22 posters were presented and defended.

Within the framework of the course, 2 expert meetings were organized:

- Climate change and its influence on vector control strategies, TDR/IPK, held on Wednesday, August 21 with more than 50 participants from several countries.
- RELDA meeting (Network of National Arbovirus Laboratories of the Region of the Americas) held on August 23 with 12 participants from 8 countries. Taking advantage of the presence of several RELDA members, an exchange was organized to discuss the dengue situation, Oropouche emergence in the Americas and the role of RELDA in the face of this new emergency.
- The course provided the opportunity for researchers from the Zikalliance and IMT/IPK projects to update research results and progress.
- Several exchanges were also held between specialists from PAHO, WHO, TDR, Minsap and IPK on the global, regional and national situation of arboviruses, their confrontation and the collaboration possibilities.



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The course had the participation of 207 participants, including 39 foreign students from 12 countries (from the American and European regions) and 168 Cuban students from the 15 provinces of the country and the Isla de la Juventud Special Municipality. The Colombian delegation stood out with 10 participants.

The 18th edition met professors and speakers of high scientific level from prestigious institutions and organizations dedicated to the study of Dengue, Zika, Chikungunya, Yellow Fever, Oropouche, including 60 foreigners from 18 institutions and international organizations and 51 Cuban professors and collaborators from 15 Cuban institutions (see list of professors and speakers).

In total, 318 specialists participated in some of the course activities and parallel activities, of them 99 foreigners (31%) from 26 countries in the region of the Americas and Europe and 219 Cubans.

The figure shows the number of national and foreign participants who have participated in the international dengue course in the period 1987-2024 for a total of 3,803 participants, including 1,949 (51%) Cubans and 1,854 (49%) foreigners from 83 countries, including Cuba.

AFD, AICA, Aliam labs solutions, BDC, Biocubafarma, BioLab International, Laif, MEDICC, MedicubaEuropa, Servicios medicos Cubanos collaborated in the development of the 18th edition of the international dengue course.

The organizers of the course thank the participants, professors, sponsoring institutions and collaborators for their collaboration in the good performance of the course 37 years after the first edition in 1987.

On [https://drive.google.com/drive/folders/1fxjRS0n8whe11-SmMqky1TktnVW94yF6?usp=drive\\_link](https://drive.google.com/drive/folders/1fxjRS0n8whe11-SmMqky1TktnVW94yF6?usp=drive_link) you can find more information including the course program, participants, photos and lectures.

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### Foreign professors and Speakers

- **Luiz Alcantara**, FIOCRUZ, Brasil
- **Kevin Arien**, Instituto Medicina Tropical, Bélgica
  - **Ana Bento**, Universidad Cornell, EUA
    - **Haroldo Bezerra**, OPS/OMS
  - **Yamili Contreras**, UADY Yucatán, México
  - **Mabel Caraballi**, Universidad McGill, Canadá
    - **Estela Cordero**, INCIENSA, Costa Rica
    - **José Cruz Rodríguez**, OPS/OMS, México
  - **Aravinda Da Silva**, Universidad Carolina del Norte, EUA
  - **Poliana Da Silva Lemos**, Ministerio de Salud, Brasil (TBC)
    - **George Dimopoulos**, Johns Hopkins, EUA
- **Anna Durbin**, Johns Hopkins Bloomberg School of Public Health, EUA
- **Pierre Echaubard**, SOAS, Universidad de Londres, Reino Unido
  - **Douglas Elizondo**, OPS/OMS
  - **Ana Bella Failloux**, Instituto Pasteur, Francia
    - **Florence Fouque**, TDR/OMS
    - **Leticia Franco**, OPS/OMS
  - **Marta Giovanetti**, FIOCRUZ, Brasil
  - **Felipe Gomes Naveca**, FIOCRUZ, Brasil
  - **Sara Gomez**, Ministerio de Salud, Colombia
  - **Guillermo Gonzalvez**, OPS/OMS, Colombia
    - **Lionel Gresh**, OPS/OMS
  - **Eva Harris**, Universidad Berkeley, EUA
  - **Nildimar Honorio**, FIOCRUZ, Brasil
- **Olaf Horstick**, Universidad de Heidelberg, Alemania
- **Thomas Jaenisch**, Universidad de Heidelberg, Alemania
- **Prem Lakshmanane**, Universidad Carolina del Norte, EUA
  - **Linda Lloyd**, GT-arbovirus internacional, EUA
- **Kleber Luz**, Universidad Federal Rio Grande Du Norte, Brasil
  - **Pablo Manrique-Saide**, UADY Yucatán, México
    - **Ana Medina**, GT-Dengue internacional
      - **Jairo Mendez**, OPS/OMS
    - **Oscar Mesones**, OPS/OMS, Nicaragua
  - **María Alejandra Morales**, Instituto Maiztegui, Argentina
  - **Lisete Pardo**, Instituto Nacional de Salud, Colombia
    - **Norma Pavia**, UADY, Yucatán, México
    - **Gabriela Paz Bailey**, CDC, Puerto Rico
  - **Koen Peeters**, Instituto de Medicina Tropical, Amberes, Bélgica
- **Corneliu Petru Popescu**, Carol Davila University of Medicine and Pharmacy, Rumania

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- **Fabiano Pimenta**, OPS/OMS, Brasil
- **Ana Cecilia Ribeiro Cruz**, Instituto Evandro Chagas, Brasil
- **André Ricardo Ribas Freitas**, Faculdade de Medicina São Leopoldo Mandic, Campinas, São Paulo, Brasil.
  - **Diana Rojas Alvarez**, OMS
  - **Carlos Saenz**, Ministerio de Salud, Nicaragua
  - **Hichem Salim**, Universidad de Vrije, Bruselas, Bélgica
    - **Gilberto Santiago**, CDC Puerto Rico
  - **Carsten Schade Larsen**, Aarhus University Hospital, Dinamarca
    - **Aleem Siddiqui**, Universidad de California, EUA
    - **Erin Staples**, CDC, Fort Collins, EUA
    - **Martha Torales**, Ministerio de Salud, Paraguay
    - **Xaveer Van Ostade**, Universidad de Amberes, Bélgica
    - **Wim Vanden Berghe**, Universidad de Amberes, Bélgica
  - **Veerle Vanlerberghe**, Instituto Medicina Tropical, Amberes, Bélgica
    - **Maria Van Kerkhove**, OMS
  - **Gonzalo Vazquez Prokopec**, Universidad de Emory, EUA
    - **Anubis Vega Rua**, Instituto Pasteur, Guadalupe
      - **Raman Velayudhan**, NTDP/OMS
      - **Andrea Vicari**, OPS/OMS
  - **Wilmer E. Villamil Gómez**, Secretaria de Salud, Barranquilla, Colombia
    - **Livia Vinal**, Ministerio de Salud, Brasil (TBC)
    - **Stephen Whitehead**, NIAID, NIH, EUA

### Cuban profsors and speakers

María G. Guzmán, Adolfo Álvarez, Mayling Alvarez, Jorge Anaya, Jose R de Armas, Waldemar Baldoquin Alberto Baly, Ana J Benitez, Eric Camacho, Martha Castro, Osvaldo Castro, Ariamys Companioni, Araiza Consuegra, Elba Cruz, Diana Ferriol, Ilario Fuentes, Geidy Fundora, Israel Garcia, Milton Garcia, Rene Gato, Lizette Gil, Aileen Gonzalez, Daniel González, Rosario Gravier, Denelsys Hernandez, Yisel Hernández, Vivian Huerta, Vivian Kouri, Maureen Leyva, Reinaldo López Barroso, María del C. Marquetti, Eric Martínez, Yanet Martínez, Zulema Menendez, Domingo Montada, Sarien Ortega, Paulo Ortiz, Isbell Planells, Carilda Peña, Jenny Peraza, Ana B. Pérez, Dennys Pérez, Melissa Perez, Luis Augusto Piedra, Jose A Portal, Rosa Ramírez, Sonia Resik, Madelaine Rivera, Dayana Rodríguez, José F. Sabatier, Gretsa Sanchez, Carlos Sebrango, Silvia Serrano, Beatriz Sierra, Yudira Soto, Olivia Tejeda, Marlon Tersidor, María E. Toledo, Iris Valdés, Luis Valdes, Tania Valdes, Maria del Carmen Zabala. Profesores y colaboradores del Instituto de Medicina Tropical “Pedro Kouri” (IPK), Centro de Ingeniería Genética y Biotecnología (CIGB), Universidad de la Habana, Universidad Martha Abreu de Villa Clara, Universidad de Sancti Spiritus, Centro de Inmunoensayo (CIE), Instituto Nacional de Higiene

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Epidemiología y Microbiología (INHEM), Hospital Hermanos Ameijeiras, Flacso, Instituto Finlay de Vacunas, Hospital Aballi, Geocuba, CPGM de Cienfuegos, Ministerio de Salud Cuba.

### Table 1. Round tables held during the theoretical course, August 19 to 23, 2024.

- Advances in the epidemiological surveillance in the Americas
- The clinic of dengue, Zika and chikungunya. Differential diagnosis. Oropouche Fever
- How to avoid deaths from dengue?
- Entomological surveillance and control of *Aedes aegypti*.
- Lessons learned in the response to the dengue emergency
- Genomic surveillance
- Oropouche. Cuban experience.
- Other emerging arboviruses
- Entomo-virological surveillance

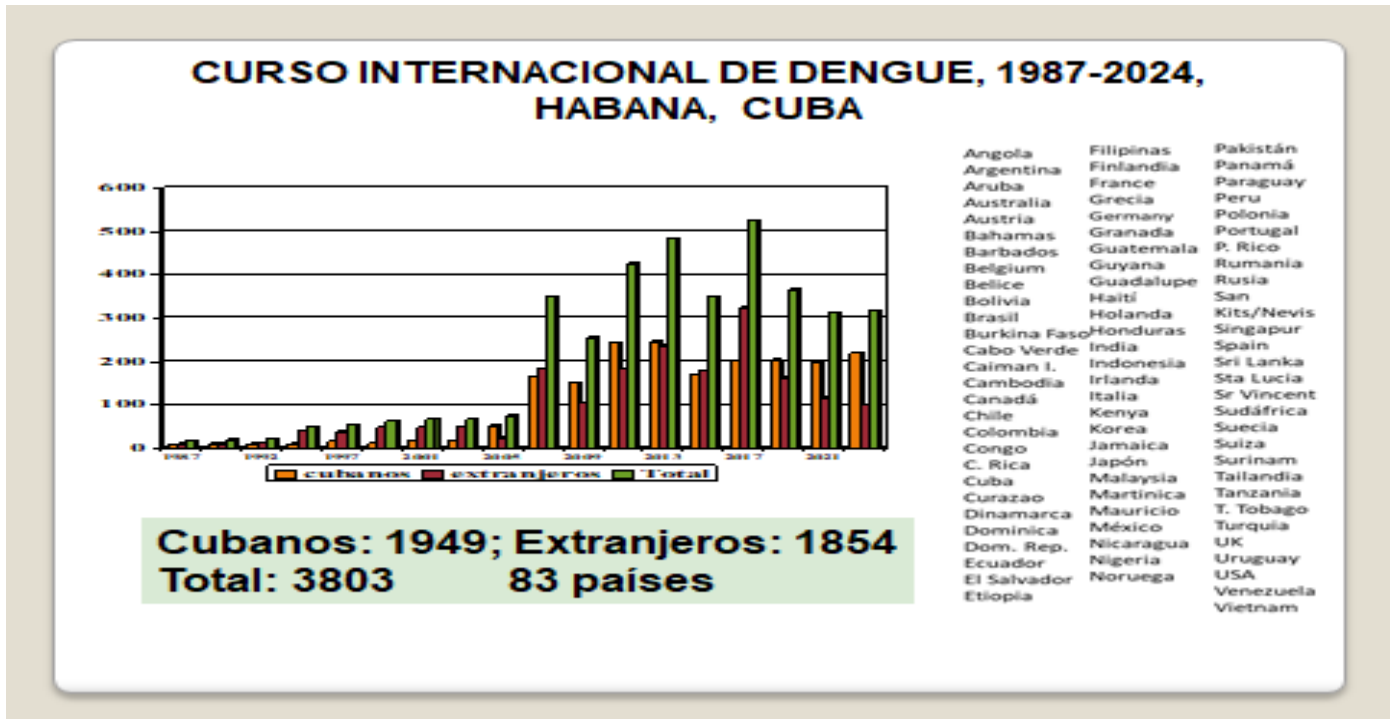
### Table 2. Symposia, August 19 to 23, 2024.

- Advances in dengue vaccines
- OMICs and Artificial Intelligence in Flavivirus research
- Arbovirus vectors and their control
- Advances and challenges in the diagnosis of dengue and other emerging arboviruses
- New evidence on the role of human mobility in the dispersion of dengue epidemics

Panel: Theoretical-methodological approaches of the social sciences for initiatives for the prevention and control of dengue and other arboviruses

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*Figure. Total participants, dengue course by year and country (1987-2024)*







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**AUSPICES**

Instituto de Medicina Tropical, “Pedro Kouri”, IPK, La Habana, Sociedad Cubana de Microbiología y Parasitología (SCMP), Ministerio de Salud Pública de la República de Cuba (MINSAP), Organización Panamericana de la Salud (OPS)/Organización Mundial de la Salud (OMS), Centro de Inmunoensayo (CIE) Institute of Tropical Medicine, Belgium, Infomed, MEDICC, American Society of Tropical Medicine and Hygiene, ASTMH, MedicubaEuropa, Special Programme for Research and Training in Tropical Diseases, TDR, Neglected Tropical Disease Program, NTDP, WHO, Centro de Ingeniería Genética y Biotecnología, CIGB, European Society of Clinical Microbiology and Infectious Diseases, ESCMID, ZIKAlliance

**COLABORATORS**

AFD, AICA, ALIAM, BDC, BIOCUBAFARMA, BioLab International, LAIF, SERVICIOS MEDICOS CUBANOS



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