



Public Health Vector Surveillance and Control

Course: Dengue and Mosquito-Borne Disease Programmes



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Introduction:

Public health vector surveillance and control for dengue and mosquito-borne disease programmes is a 5-day course for health authority and municipal vector control, entomology and environmental health units, who produce a District Vector Surveillance and Outbreak Response Plan for a case district. Aedes breeding in water storage and discarded containers keeps dengue transmission going when larval indices are not collected, insecticide resistance goes unchecked and fogging starts only after cases peak. Nominees already run field inspections or vector programmes and learn through case studies on entomological and case data. CoreConcept Training Center delivers this vector surveillance and control course.

Course Objectives:

- Calculate and interpret house, container and Breteau indices, ovitrap positivity and adult trap density to grade dengue transmission risk by neighbourhood
- Plan larval source management that combines container elimination, drainage correction, larviciding with Bti or insect growth regulators and biological agents
- Run insecticide resistance monitoring with tube and bottle bioassays and use the results to rotate insecticide classes
- Set entomological and epidemiological action thresholds that trigger stepped outbreak responses, including case-linked perifocal treatment and space spraying
- Organise community mobilisation and intersectoral work with water, waste and planning services to sustain breeding site reduction
- Build a district vector surveillance and response plan aligned with integrated vector management and the Global Vector Control Response

Target Audience:

- Municipal vector control units responsible for field inspection teams, larviciding rounds and space spraying operations
 - Public health entomology teams responsible for mosquito sampling, species identification and insecticide resistance testing
 - Environmental health departments responsible for breeding site complaints, water storage inspection and solid waste follow-up
 - Communicable disease surveillance units responsible for dengue case notification and linking case clusters to field response
 - Health promotion teams responsible for household outreach, school campaigns and community clean-up drives
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Course Outline:

Day 1: Mosquito-Borne Disease Burden and Vector Biology

- Aedes Aegypti and Albopictus Life Cycle and Biting Behaviour
- Anopheles and Culex Vectors Compared by Breeding Habitat
- Dengue Transmission Cycle With Extrinsic Incubation and Viraemia
- Urban Breeding Habitat Typology From Water Tanks to Tyres
- District Vector Programme Baseline and Capacity Gap Review

Day 2: Integrated Vector Management and Entomological Surveillance Design

- Global Vector Control Response Pillars Applied to District Programmes
- Integrated Vector Management Decision Criteria and Intersectoral Roles
- Stegomyia House, Container and Breteau Index Calculation
- Ovitraps Network Design With Egg Counts and Positivity Rates
- Adult Mosquito Sampling With Light Traps and Landing Counts

Day 3: Larval Source Management and Field Intervention Methods

- Larval Survey Protocol With Dippers and Container Inspection Forms
- Source Reduction Through Water Storage Covers and Drain Clearance
- Bti, Pyriproxyfen and Methoprene Larvicide Selection and Dosing
- Larvivorous Fish and Copepods as Biological Control Agents
- Household Inspection Routes and Premises Coverage Tracking

Day 4: Insecticide Resistance, Outbreak Triggers and Emergency Vector Response

- Tube and Bottle Bioassays for Insecticide Resistance Status
- Insecticide Class Rotation Plan Based on Resistance Data
- Entomological and Case Action Thresholds for Stepped Response
- Case-Linked Perifocal Treatment Within the Transmission Radius
- Ultra-Low Volume Space Spraying and Thermal Fogging Timing

Day 5: Case Study on a District Dengue Vector Programme

- Case District Larval Index and Ovitraps Trend Analysis
 - Neighbourhood Risk Stratification From Index and Case Clusters
 - Community Mobilisation Plan With Schools and Mosque Committees
 - Programme Indicators for Coverage, Index Reduction and Response Time
 - District Vector Surveillance and Outbreak Response Plan Completion
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Skills You Will Gain:

- Entomological Index Analysis
- Ovitrap Network Management
- Larval Habitat Assessment
- Larvicide Selection
- Insecticide Resistance Testing
- Outbreak Threshold Setting
- Community Mobilisation Planning
- Vector Programme Evaluation

Why Attend This Course:

- Deliver a District Vector Surveillance and Outbreak Response Plan for a case district to the head of communicable disease control and the municipal environmental health director
- Decide when rising larval indices or case clusters justify perifocal treatment, intensified larviciding or space spraying, using agreed thresholds
- Avoid wasted insecticide, resistant mosquito populations and late fogging rounds that leave dengue transmission unchecked
- Brief inspectors, entomology technicians and outreach volunteers on index collection, bioassay procedures and household messages

Conclusion:

Back at work, the participant presents the District Vector Surveillance and Outbreak Response Plan to the communicable disease control lead and the municipal environmental health director. They use it to set inspection rounds, place ovitraps, assign larviciding and spraying resources and agree which index or case levels trigger each response step. After the first transmission season under the plan, the unit should compare index trends, resistance results, response times and case counts against the baseline and revise thresholds and targets.

Frequently Asked Questions FAQ:

What should participants know before the public health vector surveillance and control course?

Participants should already inspect premises, supervise field teams or analyse disease data in a health or municipal service. No laboratory background is needed. Bringing recent larval survey sheets, ovitrap records or dengue case lists helps them apply the case study to their own district.

How does public health vector surveillance and control differ from a facility pest management course?

This course manages mosquito populations across whole districts to cut disease transmission, using entomological indices, resistance testing and outbreak thresholds. Facility pest courses protect individual buildings from rodents, cockroaches and flies through proofing, sanitation and contractor oversight.

Why does vector surveillance and control for dengue focus on larval sources rather than spraying alone?

Removing and treating breeding containers lowers Aedes numbers before adults emerge, while space spraying only kills adults present at that moment. Programmes that rely on fogging alone see quick rebounds and faster insecticide resistance.

What do participants take back from the public health vector surveillance and control course?

Participants take back a District Vector Surveillance and Outbreak Response Plan with an ovitrap and larval survey design, larvicide and rotation choices, action thresholds, a community mobilisation plan and programme indicators they can adapt to their own district.