

सक्षम

Strengthening Public Health Capacity for Vector-Borne Disease Control



The Pune Knowledge Cluster (PKC) is one of the eight Science and Technology Clusters established by the O/o PSA under The City Knowledge and Innovation Cluster Initiative (CKIC).

PKC aims to bring together Academic Institutions, R&D organizations, Industries, Industry Associations, NGOs, Civic Bodies, and Local and State governments to collectively work for the betterment of the region by leveraging its partner organisations' science and technology capabilities.

PKC has enabled a consortium of over 10 organizations to carry out clinical and environmental surveillance of infectious diseases like COVID-19 and vector borne diseases like Dengue over the past three years. This has resulted in gathering of several insights about how diseases are detected, tracked and managed at the city level.

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Global Context

The World Health Organization (WHO) estimates that vector-borne diseases (VBDs) account for approximately 700,000 deaths annually, representing over 17% of the global burden of infectious diseases. These illnesses are caused by viruses and bacteria and are transmitted through vectors such as mosquitoes, ticks, and flies, making them a persistent and complex public health challenge worldwide. Since 2014, large-scale outbreaks of diseases such as dengue, malaria, chikungunya, yellow fever, and Zika have affected millions, resulting in significant loss of life and placing immense strain on healthcare systems across multiple countries. Among these, dengue alone is responsible for an estimated 96 million symptomatic cases and 40,000 deaths each year. Despite this substantial burden, the WHO emphasizes that a significant proportion of dengue cases and related deaths are preventable. Effective protective measures, combined with sustained community awareness and mobilisation, can play a decisive role in reducing transmission and mitigating the impact of these diseases.

India's Mission: The Road to 2030

India stands at a defining juncture in its fight against malaria. Under the National Framework for Malaria Elimination (2016–2030), the country has committed to eliminating malaria (zero indigenous transmission) by 2027 and achieving malaria-free certification by 2030.

Key Milestones (2024–25):

- **HBHI Exit:** India exited the WHO's "High Burden to High Impact" (HBHI) group in 2024, marking its transition out of the top 11 high-burden countries globally.
- **Case Reduction:** Since 2015, malaria cases have declined by 80%, with a remarkable 97% reduction in malaria-related deaths.
- **Zero-Case Districts:** As of 2024, more than 160 districts across 23 States and Union Territories have reported zero indigenous malaria cases for three consecutive years.
- **2027 Interim Goal:** The national focus has shifted toward sub-national elimination, with regions such as Ladakh, Lakshadweep, and Puducherry already eligible for malaria-free certification.



Multipurpose Health Workers: Backbone of Public Health

Multipurpose Health Workers (MPWs) are the backbone of grassroots public health delivery. They are responsible for controlling communicable diseases such as malaria, tuberculosis, leprosy, and water-borne illnesses, while also supporting environmental sanitation, outbreak detection, and community health education. As a crucial link between the health system and the community, they play a key role in maintaining public health and managing disease outbreaks.

Their responsibilities are wide-ranging and demanding, including household visits, disease identification, blood smear collection, medicine distribution, vector and breeding site surveillance, supervision of spraying operations, promotion of hygiene practices, chlorination of drinking water sources, and maintenance of records. The overall well-being of communities, especially in rural areas, depends significantly on their work.

However, significant challenges persist. The Ministry of Health and Family Welfare (MoHFW), in its 2010 annual report, reported a substantial manpower shortage in Maharashtra, with only 9,956 MPWs in position against a recommended 16,059 (62%). This limits the effective implementation of national health programmes at the field level.

Additionally, as highlighted in the Asian Development Bank's 2022 assessment of the Maharashtra State Health System, MPWs typically receive only one-time induction training, with no structured refresher training thereafter. As a result, they are often overburdened and insufficiently equipped to address the evolving burden of diseases.

The Story of SAKSHAM

Over the past decade, data from the District Malaria Office, Pune, indicate a significant and sustained rise in dengue incidence across the district. In response, the Maharashtra State Health Department has demonstrated commendable proactiveness, consistently strengthening surveillance and response mechanisms to curb the spread of disease.



The Story of SAKSHAM

Amid these efforts, a critical gap emerged in the domain of capacity building. While frontline systems were in place, there was a clear and pressing need to periodically upskill the backbone of field implementation- the Multi-purpose Health Workers (MPWs). These ground-level health functionaries, often the first line of defence against outbreaks, require not only foundational training but continuous knowledge reinforcement to effectively respond to evolving disease patterns and field challenges.

Recognising this need, and aligned with its strategic focus on Capacity Building in Public Health, PKC stepped forward to address this gap. The initiative was catalysed by insights from Dr. Suryakant Deokar, Assistant Medical Officer (AMO), Health, Pune Municipal Corporation (PMC), who highlighted the absence of structured refresher training modules for MPWs. In response, PKC conceptualised and developed a comprehensive one-day workshop in Marathi, specifically tailored to the needs of field workers. The vision was clear: to equip MPWs with updated knowledge, practical skills, and renewed confidence to more effectively prevent and control vector-borne diseases within Pune city.

This vision took shape through a pilot workshop organised on 4th August 2023 at IUCAA, Pune, in collaboration with Pune Municipal Corporation (PMC) and ICMR–National Institute of Virology (NIV), Pune. The workshop brought together 77 MPWs actively engaged in breeding site surveillance and disease monitoring, creating a focused platform for learning and exchange.

The training was designed to go beyond conventional lectures. It featured interactive refresher sessions led by senior scientists from ICMR-NIV, covering critical topics such as dengue serotypes, vector biology, and advanced methods of vector surveillance. A distinctive highlight of the workshop was the hands-on component, where participants were given the rare opportunity to observe live mosquito specimens and larvae. This practical exposure significantly enhanced their ability to accurately identify vectors in real world field conditions- an essential skill for effective disease control.

Reflecting on the initiative, Dr. Suryakant Deokar noted, *"It is the first time that such a refresher workshop has been organized for field workers. They were extremely happy and would welcome more such opportunities."* His observation captured both the novelty and the immediate impact of the intervention.

The success of the pilot workshop did not go unnoticed. It attracted the attention of Dr. Mahendra Jagtap, State Entomologist, Maharashtra (NCVBDC), who, along with Pune's District Malaria Officer, Dr. Suresh Dhekale, recognised its potential for broader impact. Their shared vision to institutionalise and scale this model led to the evolution of the SAKSHAM series.

The Story of SAKSHAM

Subsequently, PKC, in collaboration with the District Malaria Office (DMO) and the National Centre for Vector Borne Disease Control (NCVBDC), expanded the initiative across Pune district. Through this effort, approximately 400 field workers across all 13 talukas were empowered through structured, high-quality refresher training- marking a significant step toward strengthening grassroots public health capacity.

Workshop Impact and Overview

SAKSHAM workshops are thoughtfully designed half-day refresher programs conducted in Marathi at various District Malaria Offices or the Zilla Parishad Offices across Maharashtra. Supported by District Malaria and District Health Officers, these workshops combine scientific rigor with engaging delivery.

Sessions are led by distinguished experts

Dr. Muralidhar Tambe

Prof. and Head of Community Medicine, B.J. Govt. Medical College, Pune.

Dr. Mangesh Gokhale

Scientist D (Rtd.), Medical Entomologist, ICMR-NIV, Pune.

Shri. Sunil Deshmukh

Meteorologist - B, CRS Pune.

The workshop curriculum is thoughtfully designed to provide a comprehensive understanding of vector-borne diseases and their management. It encompasses key areas such as disease epidemiology, detection and surveillance mechanisms, and vector bionomics- including lifecycle, feeding and biting behaviour, and breeding patterns. Participants are also introduced to essential concepts in vector and breeding site surveillance, alongside emerging challenges driven by climate change. Emphasis is placed on the critical role of disease data- its collection, analysis, and interpretation- in understanding transmission patterns and enabling informed decision-making. Additionally, the sessions provide an overview of current surveillance systems and standardised data reporting formats required by government authorities.

Workshop Impact and Overview

Recognising the technical intensity of these subjects, the workshop adopts a highly engaging and participatory approach. Expert speakers bring the content to life by weaving in real world experiences and field anecdotes, making complex concepts more relatable and memorable. The sessions are deliberately interactive, encouraging participants to ask questions, exchange insights, and openly discuss challenges encountered in their day-to-day fieldwork.

To reinforce learning, the theoretical sessions are complemented by group-based activities that promote active participation. Through quizzes, problem-solving exercises, and hands on games, participants are able to test and apply their knowledge in an enjoyable and collaborative environment. Small tokens of appreciation are awarded to winners, adding an element of motivation and enthusiasm.

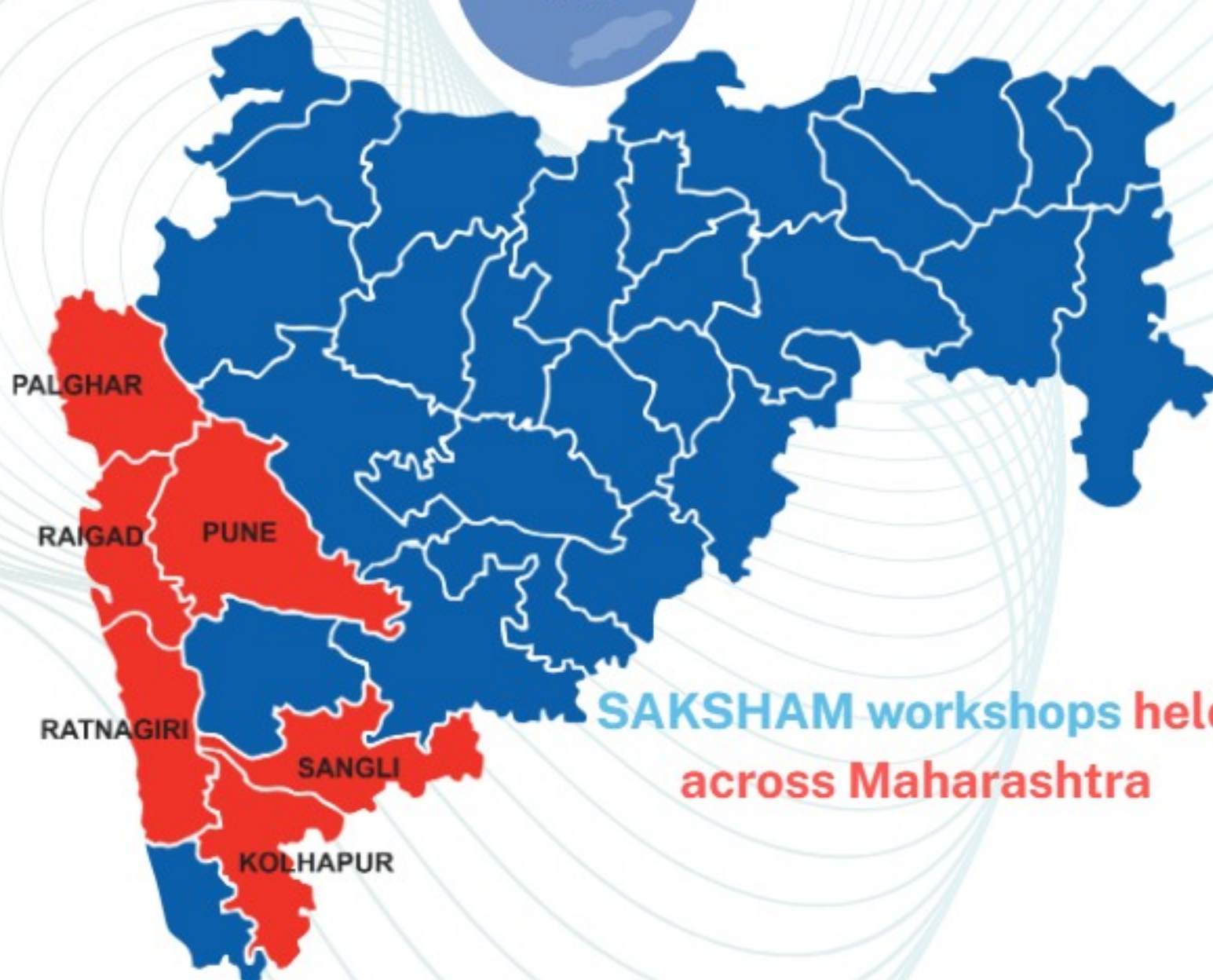
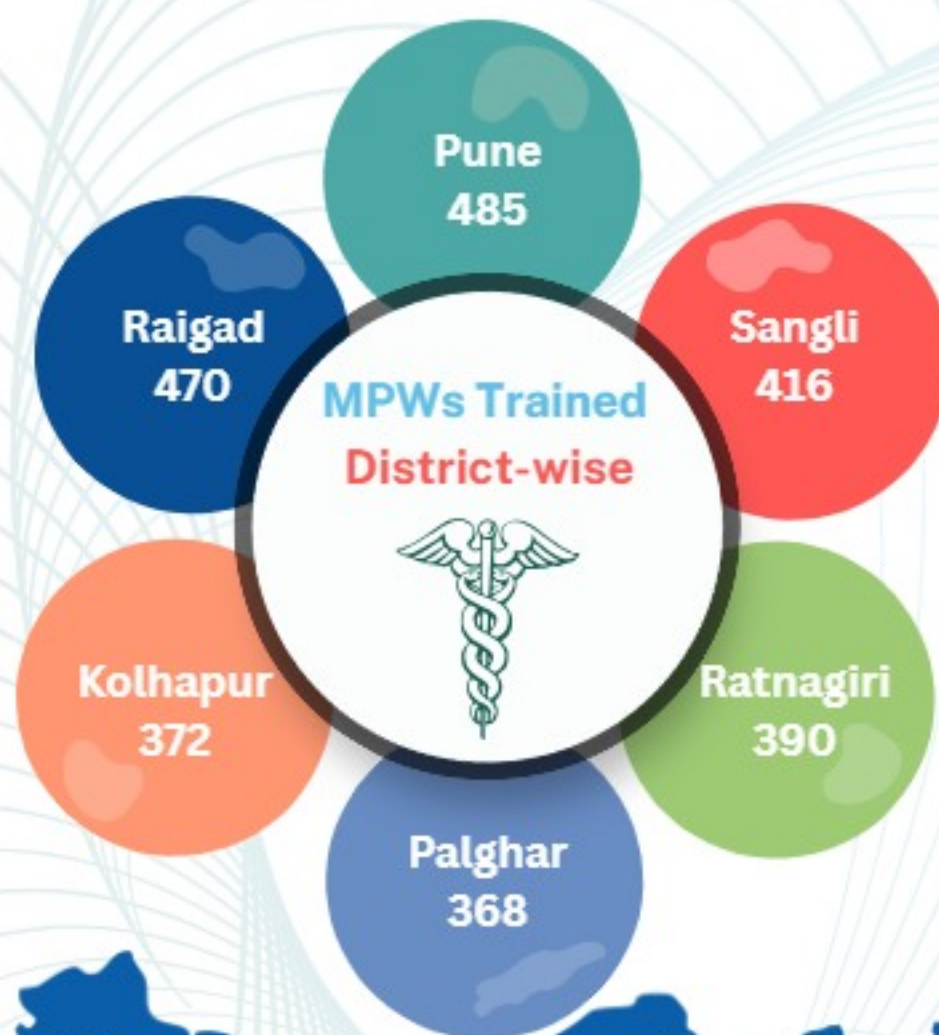
The workshop concludes with an address by the District Malaria Officer (DMO), who engages directly with the MPWs. This interaction serves to reinforce the significance of their role, placing their individual contributions within the broader framework of district-level disease prevention and control efforts, and instilling a renewed sense of purpose and pride in their work.

The SAKSHAM initiative has been positively received by participants, particularly for its accessibility, relevance, and practical orientation. Feedback collected from participants has been used to refine the workshop content over time, ensuring alignment with field-level requirements.

By strengthening the knowledge and capacity of frontline health workers, SAKSHAM contributes to ongoing efforts toward the control and elimination of vector-borne diseases, and to the development of more resilient public health systems.



Workshop Impact and Overview





WORKSHOP





WORKSHOP SNIPPETS



WORKSHOP SNIPPETS





WORKSHOP SNIPPETS



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