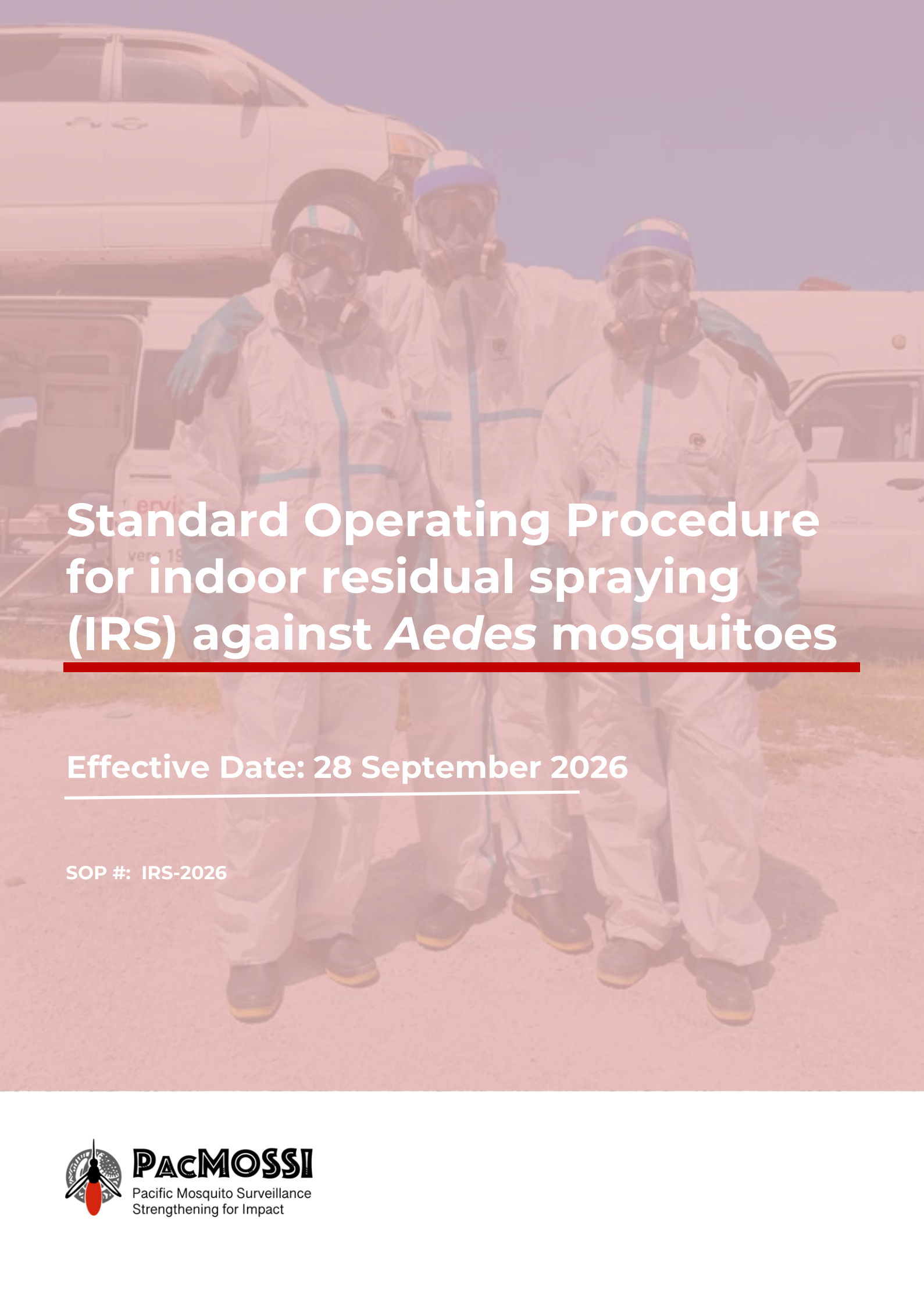




Standard Operating Procedure for indoor residual spraying (IRS) against *Aedes* mosquitoes

Effective Date: 28 September 2026

SOP #: IRS-2026



PacMOSSI

Pacific Mosquito Surveillance
Strengthening for Impact

1. Purpose

This Standard Operating Procedure (SOP) provides procedures for the safe and effective implementation of Indoor Residual Spraying (IRS) against *Aedes* mosquitoes in the Pacific.

IRS involves the application of approved residual insecticides to targeted indoor mosquito resting sites (such as walls, curtains and furniture) to reduce adult mosquito populations and support mosquito-borne disease control. IRS works against endophilic vectors, mainly *Aedes aegypti*. Other Pacific vectors such as *Ae. polynesiensis* and *Ae. albopictus* rest mostly outdoors, and outdoor residual spraying (ORS) is more appropriate for them.

2. Scope

This SOP applies to Ministry of Health (or equivalent) personnel, contractors and partner organisations involved in IRS activities.

It provides the operational procedures for planning, preparing, conducting and documenting IRS activities. Detailed guidance on spray techniques, equipment operation and insecticides is provided in other PacMOSSI guidance noted below. Components of the WHO *Operational manual on indoor residual spraying: Control of vectors of malaria, Aedes-borne diseases, Chagas disease, leishmaniases and lymphatic filariasis* may also be applicable.

Using This SOP

The following PacMOSSI resources should be used together:

Document	Purpose
IRS SOP	Provides operational procedures for conducting IRS activities. Annex includes operational forms, checklists and supporting guides.
ORS SOP	Provides operational procedures for conducting ORS activities.
Spray Operator Field Guide	Provides practical guidance on mosquito resting-site identification, equipment use and spray techniques.
Technical Notes	Provide product-specific guidance on approved insecticides, including mixing, application, personal protective equipment (PPE), storage and disposal requirements.
Risk communications guide	Provides guidance for community engagement, risk communication and behaviour-change messaging to support residual spraying activities.

Key Message

This SOP describes **what to do**, the Spray Operator Field Guide explains **how to do it**, and the Technical Notes provide **product-specific insecticide guidance**.

3. Planning for Indoor Residual Spraying

IRS should only be undertaken where it is appropriate, feasible, acceptable and supported by available information. The process should be mapped out clearly with timelines and lines of responsibility. Note that some of the processes will be ongoing, such as community engagement. Where available, local insecticide resistance information should be considered when selecting residual insecticides.

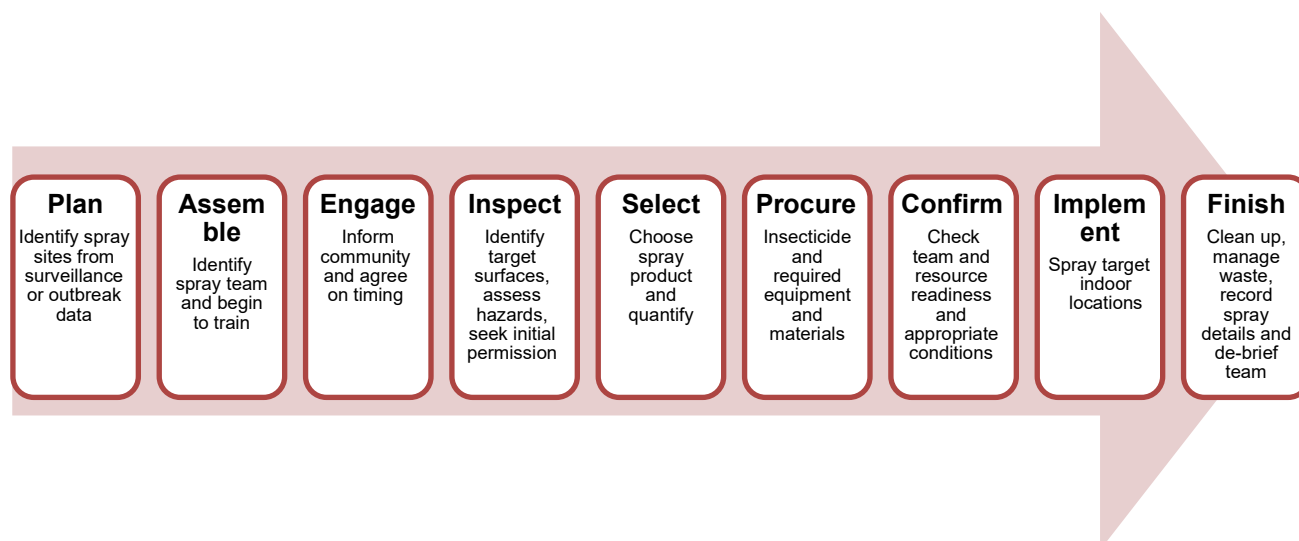


Figure 1 Key steps in planning, implementation and post-spray phases.

4. Roles and Responsibilities

Below are key roles and responsibilities for the spray team personnel tasked with implementing IRS. All personnel involved in spraying should be adequately trained and aware of the applicable SOPs, Safe Work Instruction (Annex 1), product label instructions and local health, safety and environmental requirements.

Role	Responsibilities
Spray (or Vector Control) Supervisor	Approve IRS activities, provide oversight, and review records.
Spray Team Leader	Coordinate field activities, supervise operators, complete risk assessments and operational records.
Spray Operator	Prepare and inspect equipment, conduct a pre-spray risk assessment, apply insecticide safely in accordance with SOPs, complete the <i>Premise inspection and control form</i> after each application (including areas treated, insecticide used, and date of application), and report any hazards, equipment faults, spills, or operational issues.
All Personnel	Follow this SOP, use PPE, work safely, and treat community members respectfully.

Key Message

There should be adequate and well-trained personnel plus applicable technical resources available to support safe and effective spray operations.

5. Community Engagement

Inform communities and obtain preliminary support during planning. Note that premise-level permission will also be required before spraying.

Activity	Requirement
Community sensitisation	Engage with community leaders and residents before spraying to: • Provide information about the target mosquito, including its biting times, flight range, preferred resting sites, and the diseases it can spread. • Explain the purpose of the residual spraying operation (IRS or ORS) and why it is being conducted. • Explain what residents should expect and what they need to do before, during, and after spraying. • Explain safety precautions, including how to prepare the premise and when it is safe to re-enter treated areas. • Answer questions, address concerns, and encourage community participation and cooperation. • Provide contact details for follow-up questions, concerns, or to report any issues after spraying.
Identify appropriate spray timing	Co-identify appropriate timing for spray activities. • Avoid spraying during church services, funerals, cultural ceremonies, school activities and community meetings where practicable. • Spray well in advance of these events (allowing sufficient time for surfaces to dry and rooms to ventilate), as this will protect large numbers of people.

Key Message

Community acceptance and cooperation are essential for successful IRS implementation. Early engagement helps improve access, participation and spray coverage.

6. Pre-Spray Site Inspection

A pre-spray site inspection shall be conducted before spraying to assess the entire premise, confirm that it is suitable for treatment, identify potential hazards, and obtain preliminary permission for spraying.

Activity	Requirement
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Obtain permission	☐ Introduce yourself. ☐ Explain the purpose of the visit. ☐ Explain how IRS will be done and what residents should expect. ☐ Discuss the insecticide you will use, including any relevant safety information. ☐ Obtain permission to conduct the premise inspection.
Inspect the entire house	☐ Inspect all indoor areas for mosquito resting sites suitable for residual spraying. Consider the entire house unless specific targeted areas have been defined or if specific exclusions apply. ☐ Ensure residents have prepared areas where food is prepared or eaten by removing or covering food, utensils, and other household items. Do not spray food preparation or eating areas unless they have been adequately prepared. Inspect all suitable areas, including: • Bedrooms • Living areas • Hallways and corridors • Bathrooms, including walls behind toilets, behind toilet doors, and under vanity units, where accessible. • Under furniture, where safe and accessible • All other indoor areas suitable for treatment
Assess hazards or potential issues	☐ Identify items requiring protection from spray contamination. ☐ Identify hazards that may affect safe spraying, including: • drinking water storage containers • food preparation areas • domestic animals or livestock • Birds, fish and reptiles • People in the treatment area • People intoxicated or under the influence of alcohol or drugs • Elderly or sick people that cannot be removed • electrical hazards • structural damage to house (e.g., broken steps) or restricted areas ☐ Identify any people or animals who may be unable to maintain a safe distance during spraying.
Spray permission	☐ If the premise is suitable, obtain permission for spraying. Final confirmation of consent must be obtained on the day of spraying.

Record inspection findings on the **Premise Mosquito Inspection and Control Form (Annex 3)**.

Key Message

Ensure people and animals are outside the premises prior to spraying. Identify hazards and modify spray applications as you treat the premise.

7. Residual Spray Products

Use only residual insecticide products approved for use by the relevant country authorities and preferably products that are WHO pre-qualified (see <https://extranet.who.int/prequal/vector-control-products/prequalified-product-list>). For key features of common residual spray products, see Annex 4.

Prepare insecticide spray mixtures strictly in accordance with the product label instructions, using the recommended dilution and application rate. Refer to Product Technical Notes for mixing guidance.

Prepare only the quantity required for the day's operations and use prepared mixture. Unless otherwise specified on the product label, use prepared spray mixtures within 24 hours of mixing.

Key Message

Always follow the product label instructions, Safety Data Sheet (SDS) and any relevant PacMOSSI Technical Note.

8. Equipment and Materials

The table below shows anticipated requirements for IRS. The *PacMOSSI Residual Spraying Against Aedes Vectors in the Pacific: Spray Operator Field Guide* gives examples of commonly used equipment for IRS and includes detailed guidance on equipment operation, calibration, maintenance, troubleshooting and spray techniques. It is important to perform periodic equipment inspection and calibration according to the checklist provided in Annex 6.

Type	Requirement
Spray equipment	☐ Sprayer – Handheld pneumatic compression sprayer (such as Goizper iK) ☐ Spray lance and nozzle ☐ Angled nozzle tip (e.g. 120-degree elbow) or flexible lance extension, for spraying under/behind furniture and on curtains ☐ Maintenance kit and spare parts
Insecticide	☐ Residual insecticide product ☐ Clean water supply ☐ Measuring equipment
PPE	As required by the product label or SDS: ☐ Long-sleeved clothing or coveralls ☐ Chemical-resistant gloves ☐ Enclosed footwear or boots ☐ Helmet and face shield (or goggles and hat) ☐ Respirator (full or half-face) ☐ Neck protection
First aid kit	☐ Adhesive bandages or plasters ☐ Gauze, tape, cloth bandages ☐ Antiseptic or antibiotic cream ☐ Eye wash solution ☐ Hydrocortisone or calamine cream ☐ Pain relief medication
Spill kit	☐ Bucket of absorbent material (sand, sawdust or soil) ☐ Long-handled brush with stiff bristles ☐ Short-handled brush and pan

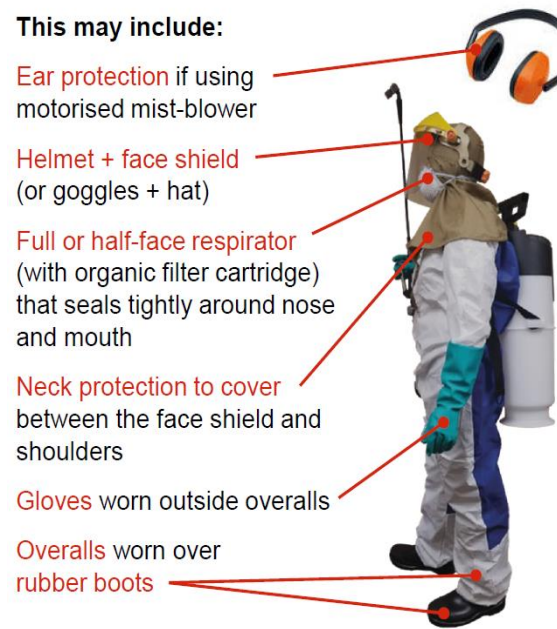
	☐ Fire extinguisher (where fuel is transported or stored) ☐ Plastic bags for hazardous waste disposal
Forms	☐ Risk Assessment Matrix (Annex 2) ☐ Premise Mosquito Inspection and Control Form (Annex 3) ☐ Daily Summary Form (Annex 3)
Other	☐ Communication device ☐ Data or credit

Key Message

Ensure all spray equipment and materials including PPE are appropriate for the selected insecticide product. Check equipment before every operation. Follow product labels and the relevant PacMOSSI Technical Note for product-specific guidance.

The Spray Equipment

The images below show examples of equipment commonly used for IRS, including hand-compression sprayers, spray lances, angled nozzles and PPE. Detailed guidance on equipment selection, operation, calibration, maintenance, troubleshooting and spray techniques is provided in the *PacMOSSI Spray Operator Field Guide*. Spray personnel should be familiar with the Field Guide and product-specific Technical Notes before undertaking IRS operations.

Handheld Pneumatic Compression Sprayer (E.g., Goizper iK sprayer)	Personnel Protective Equipment (PPE)
Components include: Lance to deliver insecticide to surfaces Safety valve to protect against over-pressurising Lid with spare nozzle and filter storage Tank translucent to see insecticide volume Straps adjustable for use on 1 or both shoulders Footrest integrated for securing sprayer Filler filter carried inside tank Control Flow Valve (CFV) for constant pressure in nozzle and auto cut-off Parking lance and hose for easy carrying Fan nozzle and filter for 580 ml/min with CFV Nozzle protector to prevent clogs or damage Images source: Goizper Group Flexible lance and/or angled nozzle tip (120° elbow for spraying under furniture) 	This may include: Ear protection if using motorised mist-blower Helmet + face shield (or goggles + hat) Full or half-face respirator (with organic filter cartridge) that seals tightly around nose and mouth Neck protection to cover between the face shield and shoulders Gloves worn outside overalls Overalls worn over rubber boots  Image source: Abt Associates/USAID

9. Spray Implementation

IRS shall be undertaken only by trained personnel using appropriate equipment, insecticides and PPE used in accordance with local requirements and regulations.

Step	Action
Pre-spray check	• Site inspection completed • Rooms and target surfaces identified • Permission to spray confirmed • Access and operational conditions suitable • People and animals are clear of the treatment area • Ask whether anyone present has asthma or breathing difficulties. • Ask whether birds, fish or reptiles are present and ensure they are removed or protected. • Equipment operational and calibrated • Clean water available for insecticide preparation where required. • Insecticide prepared according to product label instructions • PPE worn correctly • Ensure a first aid kit and spill kit are available. The spill kit must include absorbent material and a labelled hazardous waste bag for contaminated waste.
Permission and site entry/Household preparation	• Introduce yourself and your team • Explain the purpose of the visit • Obtain or re-confirm permission to spray • Confirm residents have prepared the treatment area by: ○ removing or covering food, drinking water and cooking utensils; ○ removing or protecting children's toys, bedding and clothing; ○ moving furniture away from walls where practicable; ○ securing pets and other domestic animals; and ○ ensuring occupants remain outside the treatment area during spraying. • Explain that the insecticide will take approximately 1 hour to dry. Once dry, the insecticide remains on the surface and provides residual control from several weeks to several months depending on the product and surface type. • Advise residents to avoid contact with sprayed surfaces until completely dry (~1h). If accidental contact occurs while surfaces are wet, wash the affected skin thoroughly with soap and water. • Confirm people and animals are clear of the treatment area before spraying commences. • Record refusals, access restrictions and other issues on Annex 3
Apply insecticide	• Methodically go through every room of the house • Treat all areas where mosquitoes are likely to rest • Spray walls up to 1.5 meters, under beds, furniture, behind doors, behind furniture, under and behind lounge, behind curtains, front of curtains if the fabric is a dark colour, under chairs and dark corners of the room. • Maintain even spray pressure • Use smooth, uniform spray movements at the correct distance and speed (see Spray Operator Field Guide) • Use the angled nozzle and flexible lance to achieve full, even coverage of the undersides of furniture and other resting sites.

	• Slightly overlap spray passes • Avoid runoff
Caution: Follow safe work instructions (SWI) Annex 1	• Conduct all spraying activities in accordance with the Safe Work Instructions (Annex 1). Do not commence or continue spraying if conditions are unsafe, permission has not been obtained or any stop-work criteria are met.
Monitor spray quality	• Monitor spraying throughout the operation to ensure target surfaces are treated evenly, the correct application rate is maintained, equipment remains functional, and any leaks, blockages or equipment faults are identified and corrected promptly.
Record inspection and treatment	• Record inspection findings, treatment details, refusals, access restrictions and other operational observations on the Premise Mosquito Inspection and Control Form (Annex 3).

Key Message

Only spray when conditions are safe and suitable. Avoid non-target areas and minimise spray drift.

10. Post-Spray Activities

Following completion of IRS, spray teams shall clean equipment, secure insecticides and complete required records.

Activity	Requirement
Post-Spray Advice	Advise occupants that spraying has been completed and keep everyone including the animals away from treated areas until surfaces are dry and to ventilate rooms by opening doors and windows where appropriate.
Equipment Cleaning	• Triple rinse spray equipment. • Check equipment for damage. • Report equipment faults.
Insecticide Storage	• Secure remaining insecticide. • Keep insecticides in original containers. • Lock in a purpose built container or room • Store away from food and drinking water.
Personal Clean-Up	• Remove PPE safely. • Dispose of the one-use items correctly • Wash hands and exposed skin. • Clean reusable PPE. • Store reusable respirator filters in sealed zip-lock bags or approved containers.
Operational Records	• Complete Annex 3. • Record refusals, complaints or operational issues. • Submit records to the Team Leader or Supervisor.
Team Debrief	Discuss equipment problems, community concerns and lessons learned.

Key Message

Clean equipment, secure insecticides and complete records before leaving the operational area.

11. Documentation and Reporting

Accurate records shall be completed for all IRS activities.

Activity	Requirement
Risk Assessment	Complete the Risk Assessment Matrix (Annex 2) before commencing operations.
Premise Records	Complete a Premise Mosquito Inspection and Control Form (Annex 3) for each property visited. Team Leader compiles Form B at the end of each day from all Form A sheets and submits it to the Supervisor.
Operational Issues	Record refusals, complaints, untreated areas, equipment faults and other operational issues on Annex 3.
Record Submission	Submit completed forms to the Team Leader or Supervisor at the end of each operational period.

Key Message

Complete and submit all required records promptly (see Annex 3).

12. Waste Management

All waste generated during IRS activities shall be managed in accordance with the product label, SDS information and local requirements. Waste shall be handled in a manner that protects people, animals, and the environment.

Activity	Requirement
Before spraying	• Check local requirements for insecticide waste disposal
During spraying	• Prevent contamination of water sources. • Keep insecticides and waste away from humans and animals. • Have a spill kit available for accidental spills.
After spraying	• Clean equipment safely. • Remove empty containers from the site. • Store or dispose of waste according to program procedures.

Do Not

- Dispose of insecticides, rinse water or contaminated washings into rivers, ponds, drains, stormwater systems or drinking water sources.
- Burn or bury insecticide containers unless specifically permitted by national regulations.
- Reuse empty insecticide containers for any purpose.
- Leave insecticides, empty containers or other waste at the treatment site.

Key Message

Manage insecticide waste responsibly – protect people, animals and the environment. Leave the site clean, safe and free of waste.

13. Definitions

The below definitions are adapted from *WHO Operational manual on indoor residual spraying: Control of vectors of malaria, Aedes-borne diseases, Chagas disease, leishmaniases and lymphatic filariasis* and *Manual for surveillance and control of Aedes vectors in the Pacific*.

Term	Definition
Application Rate	The amount of active ingredient (AI) of the insecticide applied to a unit of surface area, expressed in grams per square metre (g/m ²).
Indoor Resting Site	An indoor surface or location (e.g. wall, behind cupboard, curtain, underside of furniture) that provides suitable resting habitat for adult <i>Aedes</i> mosquitoes.
Site Inspection	A systematic inspection of indoor areas to identify suitable adult mosquito resting sites and determine whether they are appropriate for residual spraying.
Operational Area	The defined geographic area selected for IRS activities based on surveillance data, outbreak investigations, risk assessments, and operational planning.
Indoor Residual Spraying (IRS)	Operational procedure and strategy for vector control involving spraying interior surfaces of human dwellings or other buildings that are common resting sites for vectors with a residual insecticide to kill endophilic vectors
Personal Protective Equipment (PPE)	Clothing and equipment worn by spray personnel to minimise exposure to insecticides and other occupational hazards during IRS operations.
Residual Insecticide	An insecticide formulation that remains active on treated surfaces for a specified period after application to kill mosquitoes that rest on those surfaces.
Risk Communication and Community Engagement (RCCE)	Activities undertaken before, during, and after IRS operations to inform communities, promote understanding of the intervention, address concerns, encourage participation, and support safe implementation.
Spray (or Vector Control) Supervisor	The person responsible for planning, authorising, supervising, and evaluating IRS operations, including operational planning, safety, quality assurance, and reporting.
Spray Team Leader	The person responsible for leading a field spray team during a residual spraying operation.
Spray Operator	A trained and authorised person responsible for preparing equipment, mixing and applying insecticides during residual spraying operations.
Sprayable structure	In the context of a vector control programme, a unit (house, animal or other shelter, latrine) suitable for spraying or required to be sprayed.
Sprayable Surfaces	The inside surfaces of all structures that are of an appropriate material type for residual spraying.
Targeted areas	An indoor room or structure (generally: bedrooms, living rooms, hallways) identified through surveillance, site inspection, or operational assessment as suitable for treatment during IRS operations.

14. References and Further Reading

The following documents should be used in conjunction with this SOP and can be found on the PacMOSSI website (<https://pacmossi.org/technical-guidance>):

- *PacMOSSI Residual Spraying Against Aedes Vectors: Spray Operator Field Guide*
- *PacMOSSI Technical Notes* for selected products
- *PacMOSSI A Guide to Risk Communication and Community Engagement for Residual Spraying Against Aedes Mosquitoes*
- *WHO Operational manual on indoor residual spraying: Control of vectors of malaria, Aedes-borne diseases, Chagas disease, leishmaniases and lymphatic filariasis*
- *Pacific Community & WHO Division of Pacific Technical Support Manual for surveillance and control of Aedes vectors in the Pacific*
- National Vector Control Guidelines
- Insecticide Product Label Instructions
- Safety Data Sheets (SDS)

Key Message

Ensure all spray team members are familiar with this SOP, the Spray Operator Field Guide and relevant Technical Notes before commencing IRS activities.

Citation

This Standard Operating Procedure may be used for training and reference purposes. Users are responsible for ensuring any edits to this document are produced and approved in accordance with all relevant legal and ethical requirements governing the vector control operation.

15. Annexes

Annex	Title
Annex 1	Safe Work Instruction (SWI) for IRS Spray Teams
Annex 2	Example Risk Assessment Matrix
Annex 3	Operational Forms
Annex 4	Residual Spray Product Key Features
Annex 5	Insecticide Quantification and Mixing Guide for IRS
Annex 6	Equipment Inspection and Calibration Checklist
Annex 7	Key Community Messages and Information for IRS

Annex 3 are the primary operational forms used during IRS activities.

Annexes 4 and 5 provide planning guidance and should be used together with the relevant PacMOSSI Technical Notes for product-specific insecticide information.

Annex 1. Safe Work Instruction (SWI) for IRS Spray Teams

Purpose	Provides safe work instructions for spray team leaders and spray operators undertaking indoor residual spraying (IRS) against <i>Aedes</i> vectors. Covers personal, community, environmental and operational safety, equipment use, and record-keeping.
Audience	Spray team members including leaders and spray operators.
Date	26 September 2026
Sources	<i>Residual Spraying Against Aedes Vectors in the Pacific: Spray Operator Field Guide</i> (Version 1, October 2023) <i>WHO Operational Manual on Indoor Residual Spraying</i> (2024). Designed to complement the PacMOSSI <i>A Guide to Risk Communication and Community Engagement for Residual Spraying Against Aedes Mosquitoes</i> (2026)

Key Message

If it is not safe, do not spray. Follow the product label, wear PPE, and stop work immediately if unsafe conditions develop.

Timing	Key activities
In the Months Before Spraying	- Ensure all spray personnel are trained and authorised. Only trained personnel may handle insecticides or conduct spraying. - Confirm the IRS SOP, product label, Safety Data Sheet (SDS), and Risk Assessment Matrix (Annex 2) are current and accessible. - Procure sufficient insecticide stock within expiry date. - Service and calibrate spray equipment, including angled nozzles and lance extensions. - Ensure each team member has correctly fitting PPE - Prepare first aid kits and spill kits. - Organise communication devices and safe transport. - Establish data recording and reporting systems. - Where time allows, begin community engagement early; in outbreak responses this may happen within days.
In the Days Before Spraying	- Review the work plan and complete the risk assessment. - Check the weather forecast for spray dates. - Complete a pre-start inspection of the spray equipment to confirm it is clean, calibrated and functioning correctly. - Review the product label and Safety Data Sheet (SDS) before mixing and applying insecticide. - Confirm transport arrangements. - Confirm community notification and permission-to-spray for the target properties have been completed. - Brief all personnel on the code of conduct: wear uniform and PPE correctly, be courteous and respectful of residents and property, report any property damage immediately, and never request food or money from residents.
On the Day of Spraying	Before spraying - Introduce the team and reconfirm permission to spray with the household head or another adult before entering premise. - Inspect the premise for hazards (tripping, animals, people, no-spray objects) and confirm it is safe to spray. - Ask whether anyone present has asthma or other breathing difficulties and advise

	all occupants to remain away from the spray area. • Confirm that water, food, cooking utensils, children's toys, bedding, clothing and valuables have been removed, covered or protected as appropriate. • Ask whether birds, fish or reptiles are present and ensure they are protected or removed from the spray area. • Advise residents to avoid contact with sprayed surfaces until completely dry (~1h). If accidental contact occurs while surfaces are wet, wash the affected skin thoroughly with soap and water. • Confirm all occupants and animals are clear of the spray area before starting. During spraying • Work in teams of at least two people where practicable. • Carry a first aid kit, spill kit, drinking water and communication device, and rotate tasks where practicable to minimise fatigue and heat stress. • Wear full PPE and always follow the product label and SDS when mixing and spraying. • Apply only approved insecticide products in accordance with the product label, local requirements and PacMOSSI Technical Note. • Follow the planned room sequence. • Minimise spray drift and contamination of people, animals, and non-target surfaces. • Use the angled nozzle and lance flexible extension • Respect the privacy and property of household occupants throughout the visit. Immediately after spraying • Instruct occupants and animals to remain away from the spray area until sprayed surfaces have dried (about 1 hour, weather-dependent). • Advise occupants not to wash, clean, or repaint the targeted sprayed surfaces after treatment so the insecticide remains effective. • Advise occupants to contact a health facility or hotline number if unwell or with questions, and to go immediately to the nearest health facility or call emergency services for severe symptoms. • Leave the premise clean and tidy, removing any rubbish generated during the visit. • Complete spraying records before leaving the site.
CAUTION	Do not spray if: • Weather: Conditions prevent safe access or spraying. • People and animals: People or animals remain in the spray area, an occupant cannot be moved, or aggressive animals are present. • Permission and safety: Permission has not been granted or conditions are unsafe. • Areas and items: Kitchens or food preparation areas (unless prepared correctly); food containers or utensils; children's toys, clothing or bedding; tiled, enamel, metal or glass surfaces; underside of tin or metal roofing; water storage containers or tanks; exposed electrical wiring or fittings. Stop spraying immediately if: • A person or animal enters or comes within 10 m of the area being sprayed. • Equipment fails or a chemical spill or leak occurs. • Safe access is restricted. • Any other conditions become unsafe for personnel, the community, animals or the environment. • Any team member experiences breathing difficulty, headache, fatigue, or eye or skin irritation. Stop work immediately, notify the Team Leader and provide first aid as required. • An occupant becomes aggressive, threatening or appears affected by alcohol or

	drugs. Leave the premise immediately and notify the Team Leader.
After Spraying Is Completed	• Clean the spray equipment using the triple-rinse procedure, including the spray tank, filters and lance/nozzle, before storage. • Dispose of leftover insecticide and rinse water according to the product label and local requirements. • Remove and store PPE correctly followed by a full-body wash for all spray personnel. • Complete and submit all operational records before the end of the workday.
Incident Reporting	• Report all chemical spills, accidental exposures, injuries, equipment failures and community incidents immediately to the Team Leader. • Seek medical attention promptly if exposure results in persistent or severe symptoms. • Record and report incidents in accordance with organisational procedures.

Annex 2. Example Risk Assessment Matrix for IRS

Note: This should be adapted based on the local situation and checked against applicable occupational health and safety requirements. Re-rate hazards when a condition changes.

Province/Island District/Zone. Community/Suburb
Date:..... Assessor:

Hazard	Potential Risk/Consequence	Initial Risk Rating	Control Measures	Residual Risk Rating
Aggressive animals	Bites or injury to personnel	High	Request animals are secured. Do not enter if unsafe.	Low
Aggressive or uncooperative occupants	Unsafe working conditions	High	Explain activity, remain respectful, do not enter premise if refused.	Low
Children, residents or animals entering the spray area	Insecticide exposure	High	Ensure all occupants and animals remain outside during spraying and until treated surfaces are completely dry.	Low
Insecticide mixing	Chemical exposure from incorrect mixing or handling	High	Mix insecticides in accordance with the product label and SDS while wearing the required PPE.	Low
Chemical exposure	Skin, eye or inhalation exposure	High	Wear PPE and follow the product label and SDS.	Low
Chemical spill	Exposure or environmental contamination	High	Stop work, contain spill and follow spill procedures, and dispose of waste appropriately.	Low
Manual handling	Muscle strain or back injury	Medium	Use safe lifting techniques and avoid lifting full spray tanks unnecessarily.	Low
Heat stress and dehydration	Heat illness or reduced performance	High	Carry drinking water, take regular breaks and avoid prolonged work during the hottest part of the day where practicable.	Medium
Slips, trips and falls	Injury to personnel	Medium	Inspect the work area, remove or avoid hazards where possible, and wear suitable footwear.	Low
Household hazards (e.g. clutter, poor lighting, unstable floors)	Injury to personnel	Medium	Assess the work area before spraying and avoid unsafe areas.	Low
Electrical hazards	Electric shock	High	Do not spray exposed electrical installations. Avoid contact with damaged electrical fittings.	Low
Equipment failure	Insecticide leaks, operator exposure or ineffective spraying	High	Inspect and calibrate equipment before use. Remove damaged or leaking equipment from service immediately.	Low
Working alone	Delayed emergency response	High	Work in teams of at least two people where practicable and maintain communication.	Low
Vehicle or boat transport (where appropriate)	Injury, accident or equipment damage	High	Follow safe transport procedures and secure personnel, equipment and insecticides during transport.	Medium
Severe weather	Unsafe travel or delayed operations	High	Suspend field activities until conditions are safe.	Low

Site-Specific Hazards

(Examples: cyclones, flooding, security issues, special local circumstances)

Hazard	Initial Risk Rating	Control Measures	Residual Risk Rating

Risk Assessment Outcome

- ☐ Controls implemented
- ☐ ORS can proceed safely
- ☐ Additional controls required

Assessor Signature: _____

Date: _____

Risk Rating Guide

Rating	Description
Low	Minor injury or impact. Routine controls are adequate.
Medium	Moderate injury or impact. Additional controls may be required.
High	Serious injury, environmental impact or operational disruption. Controls must be implemented before work proceeds.

Key Message

If risks cannot be reduced to an acceptable level, do not proceed with spraying

Annex 3. Operational Forms

Click the links below to access the forms. For editable versions of the forms, email pacmossi@jcu.edu.au

Form A. Premise mosquito inspection and control form	https://pacmossi.org/resource/premise-inspection-aedes-form/
Form B. Daily summary form	https://pacmossi.org/resource/daily-summary-form-aedes/

Annex 4. Residual Spray Product Key Features

This guide provides a summary of products currently supported by PacMOSSI or commonly used in the Pacific for residual spraying activities. Detailed instructions on mixing, application, PPE, storage and disposal are provided in the relevant Technical Notes.

Product	Active Ingredient	Insecticide Group	Indicative Residual Activity Indoors*	Technical Reference
Demand® 100CS	Lambda-cyhalothrin (100 g/L)	Pyrethroid	Up to 12 weeks	<i>PacMOSSI Technical Note: Lambda-cyhalothrin (Demand® 100CS)</i>
Biflex® Aquamax	Bifenthrin (100 g/L)	Pyrethroid	Up to 6 weeks	<i>PacMOSSI Technical Note: Bifenthrin (Biflex® Aquamax)</i>
Actellic® 300 CS	Pirimiphos-methyl (300 g/L)	Organophosphate	Up to 8 months	<i>PacMOSSI Technical Note: Pirimiphos-methyl (Actellic® 300 CS)</i>

**Residual performance indoors may differ from outdoor performance and can vary depending on surface type (e.g. porous vs painted), ventilation and local environmental conditions; confirm current figures against the product label.*

Insecticide Selection Considerations

When selecting an insecticide, consider:

- target mosquito species;
- known or anticipated insecticide resistance status of local vectors;
- environmental conditions;
- expected duration of residual control;
- available application equipment and materials including PPE; and
- availability through approved procurement systems.

Key Message

Use only insecticide products approved for use by local authorities and preferably also WHO pre-qualified. Always refer to the relevant product label instructions, SDS and relevant PacMOSSI Technical Note before preparing or applying insecticides.

Annex 5. Insecticide Quantification and Mixing Guide for IRS

This annex provides a practical guide for estimating spray mixture and insecticide requirements for Indoor Residual Spraying (IRS).

Estimating Spray Mixture Requirements

Estimate the amount of spray mixture required based on the number of rooms to be treated.

General guide

House	Rooms	Approximate spray mixture
2-bedroom house	6 rooms	3 L
3-bedroom house	8-9 rooms	4-5 L
4-bedroom house	10 rooms	5 L

Notes

- Allow approximately **0.5 L of spray mixture per room**.
- Actual requirements will vary depending on room size, wall surfaces, furnishings and the treatment method.
- Prepare only the amount of spray mixture required for the day's work and allow a **5–10% contingency** for operational losses.

Planning and Quantification Checklist

Activity	Guidance
Define the spray plan	Identify the communities or households to be treated and estimate the number of houses requiring IRS. Select the insecticide according to national guidelines and determine the number of spray cycles based on the product's residual efficacy.
Estimate spray mixture required	Estimate the number of rooms to be treated and calculate the total volume of spray mixture required (approximately 0.5 L per room).
Calculate insecticide required	Use the product label to determine the amount of insecticide concentrate needed for the total spray mixture. Follow the product label and Safety Data Sheet (SDS).
Include contingency	Add 5–10% to allow for equipment calibration, operational losses and unexpected additional treatments.
Quality check	Verify all calculations before preparing spray mixture or procuring insecticide. ☐ Number of houses confirmed ☐ Spray mixture requirement estimated ☐ Product selected ☐ Insecticide quantity calculated ☐ Contingency included ☐ Calculations independently checked

Example

A spray team plans to treat **500 three-bedroom houses with Demand® 100CS**.

Step 1 – Estimate spray mixture

- Approximate spray mixture per house = 4.5 L
- Total spray mixture = $500 \times 4.5 \text{ L} = 2,250 \text{ L}$

Step 2 – Calculate insecticide

Using Demand® 100CS:

- Mixing rate = 40 mL per 10 L of spray mixture
- Spray mixture required = 2,250 L
- Product required = 9.0 L
- Add 10% contingency = 0.9 L
- Total product required = 9.9 L (approximately 10 L)

Detailed mixing instructions should always follow the product label, Safety Data Sheet (SDS), and relevant PacMOSSI Technical Notes.

Key Message

Estimate the number of houses and rooms first, calculate the total spray mixture required, then determine the amount of insecticide concentrate using the product label. Always verify calculations before procurement and field deployment.

Annex 6: Equipment Inspection and Calibration Checklist

Complete this checklist before each IRS operation to confirm that spray equipment is safe, functional and ready for use.

Province/Island District/Zone.Community/Suburb

Date: Team Leader: Equipment ID:.....

Equipment Inspection Checklist

Item	Pass	Fail	Action Required
Spray tank clean and free from cracks, leaks or damage	☐	☐	
Tank lid and seal secure and in good condition	☐	☐	
Hose free from leaks, cracks or damage	☐	☐	
Lance securely attached and free from leaks	☐	☐	
Correct nozzle fitted and securely attached	☐	☐	
Trigger/valve operates correctly	☐	☐	
Nozzle clean and not blocked	☐	☐	
Filters/strainers clean and correctly fitted	☐	☐	
Spray produces an even, continuous pattern	☐	☐	
Measuring equipment clean and readable	☐	☐	
PPE available and in good condition	☐	☐	
Spill kit available	☐	☐	
First aid kit available	☐	☐	

Functional Check

Item	Yes	No	Comments
Equipment has been inspected before use	☐	☐	
Correct nozzle fitted for the selected product	☐	☐	
Nozzle output is checked (1 minute timed discharge)	☐	☐	
Spray pattern checked and acceptable	☐	☐	
No leaks detected during operation	☐	☐	
Equipment operates correctly and is ready for use	☐	☐	

Note: Goizper iK sprayers have a built-in pressure regulation system and do not require routine field pressure calibration. Operators should inspect the equipment before use, ensure the correct nozzle is fitted, and verify that the spray pattern is even and consistent. Always follow the product label and relevant PacMOSSI Technical Notes.

Equipment Outcome

☐ Equipment ready for use ☐ Equipment requires repair ☐ Equipment removed from service

Comments:

Checked by: _____ Signature: _____ Date: _____

Key Message: Use only serviceable, leak-free and calibrated equipment for spraying.

Annex 7: Key Community Messages and Information for IRS

Key community messages are provided below. Further details are available in the PacMOSSI *A Guide to risk communication and community engagement (RCCE) for residual spraying against Aedes mosquitoes*.

Topic	Key Message
Why are we spraying?	Indoor Residual Spraying (IRS) is used to reduce adult mosquito populations and help prevent mosquito-borne diseases such as dengue, chikungunya and Zika. The mosquito we are targeting likes to rest indoors and feeds primarily on humans.
Where will spraying occur?	Spraying will target indoor surfaces where mosquitoes commonly rest, including walls (up to the recommended height), curtains, furniture, and other suitable resting sites in bedrooms, living areas and other rooms of the house.
Is the insecticide safe?	Only approved insecticides are used according to the product label. When applied correctly by trained personnel, they do not pose a significant risk to people or domestic animals.
What should residents do before spraying?	Cover or remove food, drinking water, cooking utensils, children's toys, bedding and clothing. Move furniture away from walls where practicable, secure pets, and ensure people remain outside the treatment area during spraying.
What should residents do during spraying?	Stay outside the treatment area until spraying is complete. Follow all instructions provided by the spray team.
What should residents do after spraying?	Keep people and animals away from treated areas until surfaces are completely dry (about 1 hour). Once dry, the insecticide bonds to the surface and provides residual control for several weeks. Residents may continue normal household cleaning, including sweeping, mopping floors and wiping benches or countertops. However, avoid washing, scrubbing, repainting or replastering treated walls, furniture or other sprayed surfaces, as this can remove the insecticide and reduce its effectiveness.
Will spraying reduce the number of mosquitoes in the house?	Yes. IRS kills mosquitoes that rest on treated surfaces after entering the house, helping to reduce indoor mosquito populations. For the greatest impact, IRS should be combined with outdoor residual spraying (ORS), source reduction, and community clean-up activities to reduce mosquito populations around homes and throughout the community.
How can residents help?	Remove containers that collect water, keep yards and surroundings clean, screen houses where possible, report mosquito problems, and support mosquito control activities in the community.
Why shouldn't treated surfaces be washed?	Washing, scrubbing, repainting or replastering treated surfaces removes the insecticide and reduces the residual protection provided by the treatment.
Questions or concerns	Residents should contact the local health authority, Spray Team Leader or Supervisor if they have any questions or concerns about the spraying programme.

Key Message for Community Leaders

Community leaders play an important role in supporting IRS activities by:

- Providing information about the target mosquito, the diseases it spreads, and the purpose of IRS.
- Informing residents about the timing and purpose of planned spraying activities.
- Encouraging community participation and cooperation with spray teams.
- Assisting spray teams with access to homes and other community buildings, where appropriate.
- Promoting the removal of mosquito breeding sites through regular source reduction and community clean-up activities.
- Helping address community questions, concerns, and misconceptions about the spraying program.

Key Message: IRS is one component of an integrated mosquito control program. Community participation and removal of larval habitats are essential for lasting mosquito control.