Rockhampton Regional Council

DENGUE MANAGEMENT PLAN

2023 - 2027

Acknowledgements

This plan was developed by Rockhampton Regional Council in collaboration and consultation with the Central Queensland Public Health Unit, Rockhampton.

Table of Contents

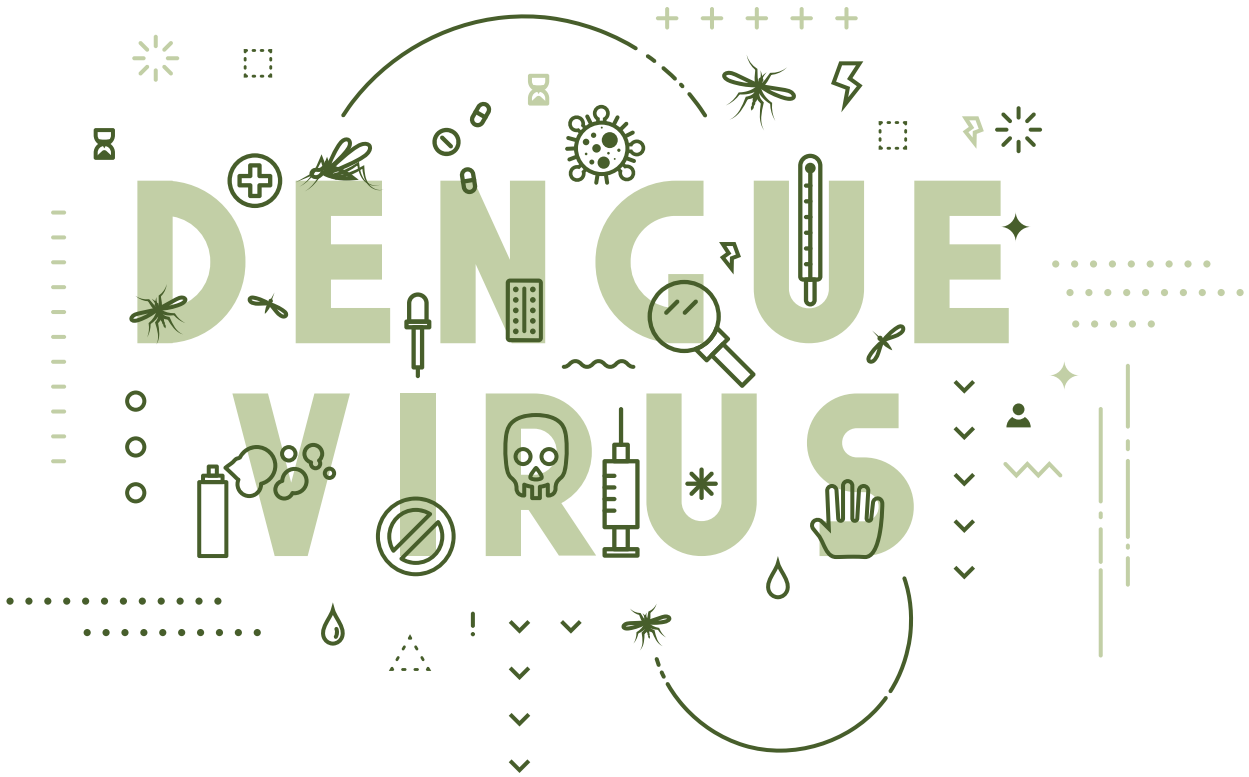
Introduction

Aedes aegypti is the main vector of Dengue and is present in the Rockhampton Region. *Aedes albopictus* is also a vector for dengue and whilst not present in Australia, it has been intercepted in Australian international seaports. Imported cases of Dengue have been diagnosed in the Rockhampton Region for many years. In 2019 Rockhampton experienced a Dengue outbreak with 13 cases confirmed, including locally transmitted cases.

Aedes aegypti and Aedes albopictus are also vectors of Zika virus.

Changing climatic conditions, higher temperatures and higher rainfall may have an impact on the breeding areas of other mosquitoes and may cause the southwards expansion of tropical mosquito-borne diseases such as Malaria, Dengue fever, Zika, Chikungunya, Japanese encephalitis and epidemic polyarthritis.

Queensland Health has determined Rockhampton to be a moderate risk to a dengue outbreak, based on local characteristics. Moderate risk areas are those where at least one vector (*Aedes aegypti or Aedes albopictus*) is present, relatively few viraemic travellers arrive from dengue endemic areas and where there is no recent history of other *Aedes aegypti or Aedes albopictus* vectored arboviruses.



What is dengue?

Dengue is an infection caused by one of four dengue viruses in the family Flaviviridae. In terms of morbidity, mortality and economic costs, dengue is one of the most important mosquito-borne viral disease of humans.

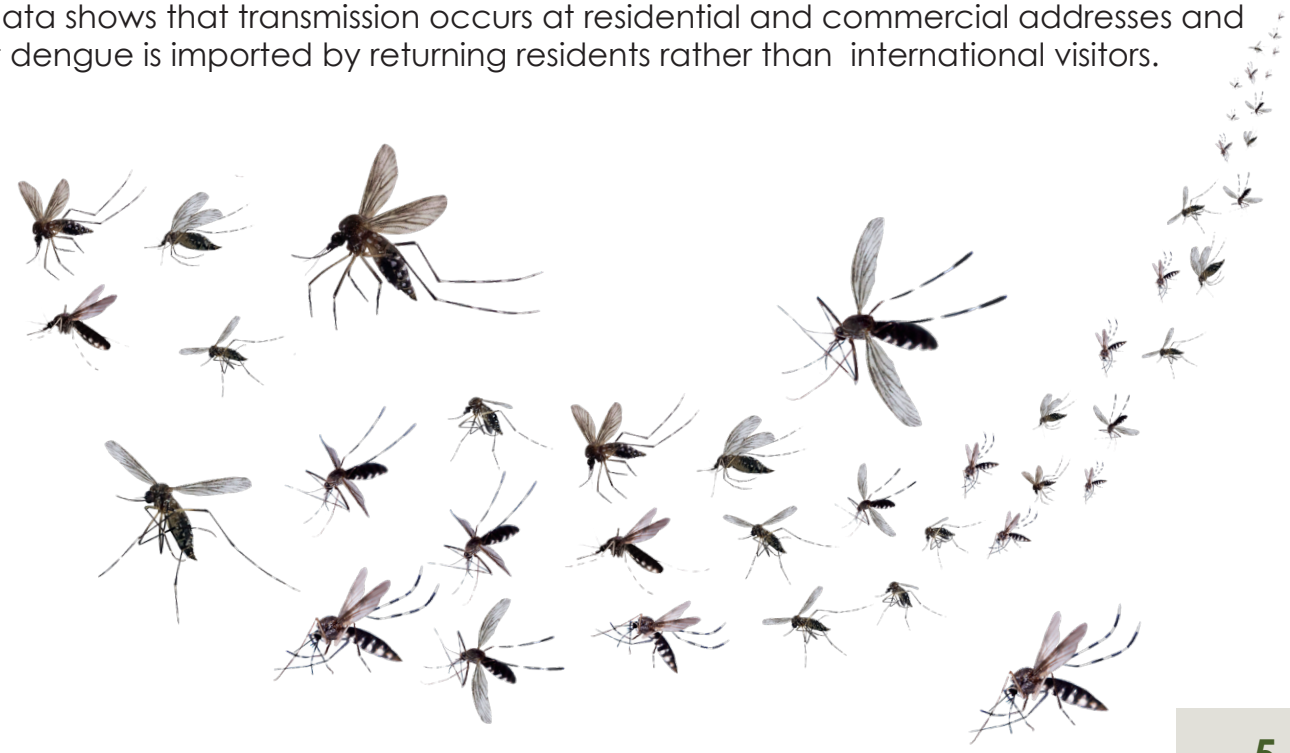
There are four dengue virus serotypes (DENV- 1, 2, 3 and 4) and there are genetic variants of these serotypes (genotypes) are found in different geographic locations. A person can acquire a maximum of four dengue infections during their lifetime, one infection with each dengue serotype. Infection with one dengue serotype confers immunity to that particular serotype, but may result in an increased risk of complications with subsequent infections of another serotype. Infection with a dengue virus may be subclinical (asymptomatic) or may cause illness ranging from a mild fever to a severe, even fatal, condition. Hospitalisation may be required depending on the severity of symptoms.

Severe dengue (also known as Dengue Haemorrhagic Fever) is characterised by plasma leakage leading to shock that can be fatal, particularly among young children. Approximately 2.5% of people affected with severe dengue die, although with timely treatment this rate is often reduced to less than 1%. Vaccines for dengue are currently under development.

Typical dengue symptoms include:

- Sudden onset of fever (lasting three to seven days) and extreme fatigue,
- Intense headache (especially behind the eyes),
- Muscle, joint and back pain,
- Loss of appetite, vomiting and diarrhoea,
- Taste aberrations (metallic taste),
- Skin rash,
- Minor bleeding (nose or gums).

Current data shows that transmission occurs at residential and commercial addresses and that most dengue is imported by returning residents rather than international visitors.

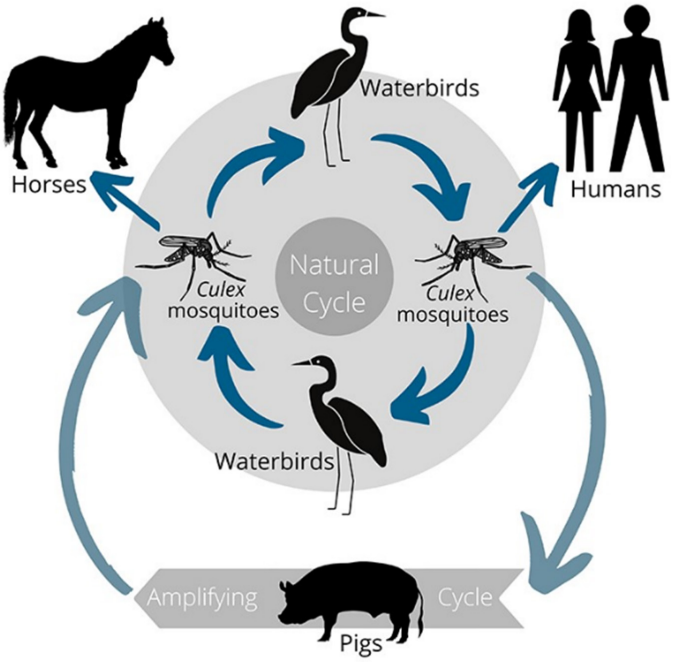


Other Diseases

Zika

Zika is a virus that is closely related to dengue. If someone is infected with Zika virus, it can typically take 3 to 12 days for symptoms to appear. The symptoms are like those caused by the flu and can include fever, a skin rash, pain in the joints, muscle pain, a headache especially behind the eyes, conjunctivitis and weakness or lack of energy. Between 2013 and 2015 there were large outbreaks of Zika virus infection in several Pacific countries. Since 2015 large outbreaks have been occurring in central and southern America and are continuing. Recent outbreaks in the Pacific and the Americas have raised concerns that Zika virus infection may cause birth defects such as microcephaly if a woman is infected while pregnant.

An imported case of Zika virus was diagnosed in the Rockhampton Region in 2016.



Japanese Encephalitis

Japanese encephalitis virus (JEV) is a virus that is primarily transmitted by bites from infected mosquito vectors and is maintained in a mosquito-water bird or mosquito-pig cycle. Pigs are known as 'amplifiers' of the virus as they develop levels of virus in their blood sufficient to infect mosquitoes for around 4 days.

Human receptors and other animals such as horses can catch JEV but will not form part of the lifecycle, as they do not develop levels of the virus to sufficient numbers in their blood. JEV is mainly transmitted through the Culex species of mosquitoes, notably for our area Culex Annulirostris.

The majority of people who are infected with JEV have no or mild symptoms. Severe disease may be characterised by acute encephalitis (inflammation of the brain), with sudden onset of high fevers and chills, severe headache, neck stiffness, disorientation, convulsions, paralysis and coma. Of these severe cases approximately one third die and one third are left with permanent disabilities.

JEV infection is preventable though vaccination.

Dengue Vectors

Dengue and zika viruses are transmitted by the highly urban *Aedes aeqypti* mosquito and the *Aedes albopictus* mosquito.

Aedes aeqypti live primarily in domestic environments and are predominantly a day biting mosquito. Although not present in Australia, *Aedes albopictus* is established throughout the majority of Torres Strait outer islands and has been intercepted in Australian international seaports including Darwin, Cairns, Townsville, Brisbane, Sydney and Melbourne. Without timely detection on the mainland, *Aedes albopictus* is expected to quickly colonise and establish itself through much of coastal Australia, thereby enhancing the potential risk of exotic disease outbreaks.

Lifecycle

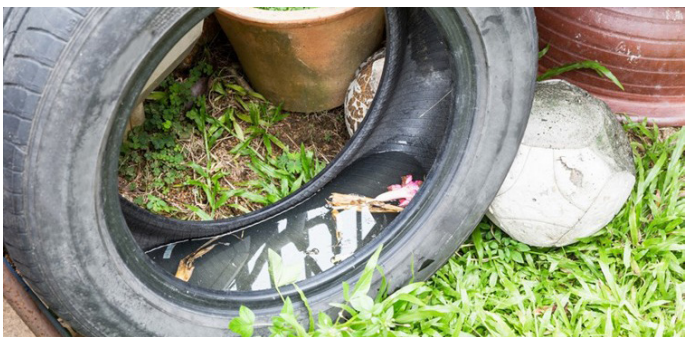
The lifecycle of a mosquito goes through four distinct stages egg, larval, pupal and adult as described below. The larval stage is further broken into 4 stages as the larvae grows.

Larval Habitat

Larvae of *Aedes aegypti and Aedes albopictus* develop primarily in:

- Artificial containers holding water, including cans, buckets, jars, pot plant saucers, self-watering pot plants, birdbaths, boats, tyres and tarpaulins,
- Roof gutters and poorly maintained or unscreened rainwater tanks,
- Natural sites such as bromeliads, tree axils and fallen palm fronds,
- Subterranean sites such as wells, telecommunication pits and drain sumps.

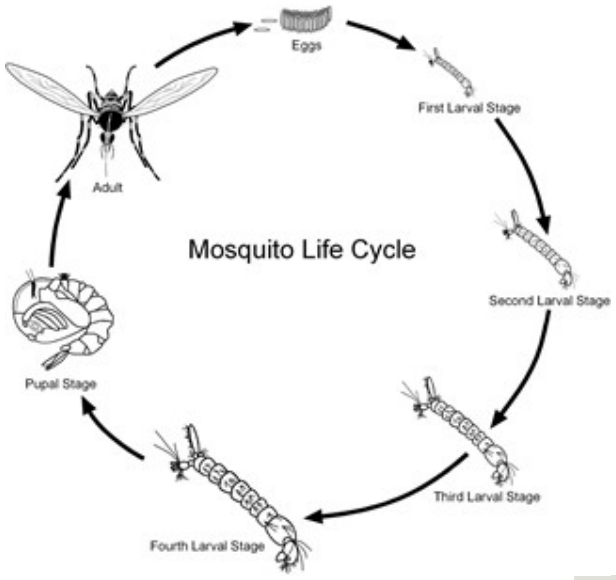
In addition to artificial larval habitats, *Aedes albopictus* also inhabits other natural environments such as rock pools.



Adult mosquito behaviour

Aedes aegypti is associated with urban areas and are known to rest indoors in dark places such as wardrobes and under beds. Females are easily disturbed when biting and prefer to bite humans during daylight hours. One dengue-infected female mosquito is capable of biting and infecting several people during one full feed. Residents can manage exposure to this species because it does not disperse far from larval habitats and humans, provided that human hosts and oviposition sites are available.

Aedes albopictus are more aggressive biters, feed predominately outdoors, may tolerate colder climates and may disperse farther than *Aedes aegypti*.



How does dengue spread?

Dengue is not transmitted directly from person to person (however transmission via blood transfusion is possible). Dengue is transmitted when an infective female vector mosquito bites a susceptible person. This person may become unwell 4 to 7 days later (onset range 3 to 14 days).

An infected person can transmit the virus to a vector mosquito from shortly before the onset of fever to the end of the feverish period, usually 4 to 5 days.

After biting an infected person, an infected mosquito may be able to transmit the virus after 8 to 12 days. The duration is influenced by many factors such as ambient temperature and has been reported to be as short as 5 days. The cycle of transmission between subsequent rounds of transmission to humans is usually estimated as 14 days during outbreaks. Consequently, mosquito control activities need to be initiated urgently to reduce the likelihood of transmission.

Purpose

The purpose of the Plan is to provide a strategic direction on the management of dengue in the Rockhampton region to reduce the risk of endemic dengue in the Rockhampton Region and minimise the number of locally acquired dengue cases.
The plan is supported by the subsequent development of underlying associated documents.

Links to Council's Corporate Plan 2022-2026

Rockhampton Regional Council's Corporate Plan 2022-2027 sets the strategic direction and priorities for our organisation for the next five years.

Whilst management goals are not specifically outlined in the Corporate plan the actions undertaken in this area support the following commitments.

Goal 2.1 Our Community: Our places and spaces enhance livability and diversity of our communities.

Goal 4.3 Our Environment: Our public spaces add value to our Region and our communities.

Vector Management Plan 2023-2027

The Vector Management Plan establishes and promotes a cooperative management of the impacts of vectors within the region and provides direction to Vector Management Officers and the community.

Key Components

This plan details four key components of dengue management:

1. Mosquito surveillance
2. Mosquito control
3. Disease surveillance
4. Public awareness and community engagement

Response Procedures

The plan outlines response procedures to:

- Routine prevention
- Sporadic cases
- Outbreaks

Key Components			
Mosquito Surveillance	Mosquito Control	Disease Surveillance	Public Awareness and Community Engagement
Objectives			
To maintain current surveillance systems.	To implement best practice treatment.	To collect, use and make available reliable data relevant to vector management.	To provide accurate, accessible and timely information on dengue and mosquitoes.
To minimise the local establishment of new dengue vectors and source reduction of existing dengue vectors.	To minimise the risk of dengue on the community		To raise community awareness of mosquitoes and impacts and their capacity to identify and manage mosquitoes and breeding sites
To minimise the risk of dengue on the community.			To establish and maintain long-term stakeholder commitment to and coordinated dengue management.
To collect, use and make available reliable data relevant to dengue management.			To ensure compliance with vector management related legislation.
Outcomes			
Introduction is prevented and spread, and establishment of dengue vectors is reduced.	Risk of locally transmitted dengue is minimised.	Accurate information is the basis for decision making.	Stakeholders are informed, knowledgeable and have ownership of dengue management.
Risk of locally transmitted dengue is minimised.	Effective treatment methods are implemented with adherence to relevant legislation.		Appropriate education programs are implemented at strategic times throughout the year.

Legislative Framework

The legislation used in disease surveillance and mosquito management in Queensland include the:

- *Public Health Act 2005,*
- *Public Health Regulation 2018*
- *Medicines and Poisons Act 2019*
- *Medicines and Poisons (Pest Management Activities) Regulation 2021*

The *Public Health Act 2005* places a responsibility on owners and occupiers of all properties to ensure that an accumulation of water or another liquid at the place is not a breeding ground for mosquitoes. It also (through the regulation) places requirements on tanks or other receptacles that are used or intended to be used for holding or storing water or another liquid to prevent mosquito breeding.

The *Public Health Act 2005* provides the ability of the chief executive officer to approve inspection programs under which authorised persons may enter places to monitor compliance with the above.

The *Medicines and Poisons Act 2019* requires all mosquito control activities involving the application of pesticides to be conducted by a licensed pest management technician with some exceptions (e.g. S-methoprene formulations and lethal ovitraps used for dengue control). The exception applies to authorised persons, entomologists, health officers and vector officers.

Stakeholders

Public

Routine mosquito control and the removal of mosquito breeding sites around domestic and commercial premises is the responsibility of the resident or property occupier or owner.

Council officers will on complaint basis, inspect premises suspected of breeding mosquitoes to determine if the premises is (or likely to be) a Public Health Risk. If it is determined that the premises is a Public Health Risk Council will require the occupier or owner to undertake remediation works.

Further enforcement action and additional powers may be undertaken by Council and/or Queensland Health when there is a risk of a disease outbreak eg spraying.

Local government

Council is delegated with administering and enforcing sections of the *Public Health Act 2005 and Public Health Regulation 2018* which relate to mosquitoes and mosquito habitats. Council ensures that the public complies with relevant sections of the Act to exclude the potential for mosquito breeding.

Council will set our priorities for managing mosquitoes within our region and implement relevant programs as required.

During outbreaks Council will work with Queensland Health to ensure a coordinated response.

Many local governments conduct mosquito management programs based on Integrated Pest Management principles.

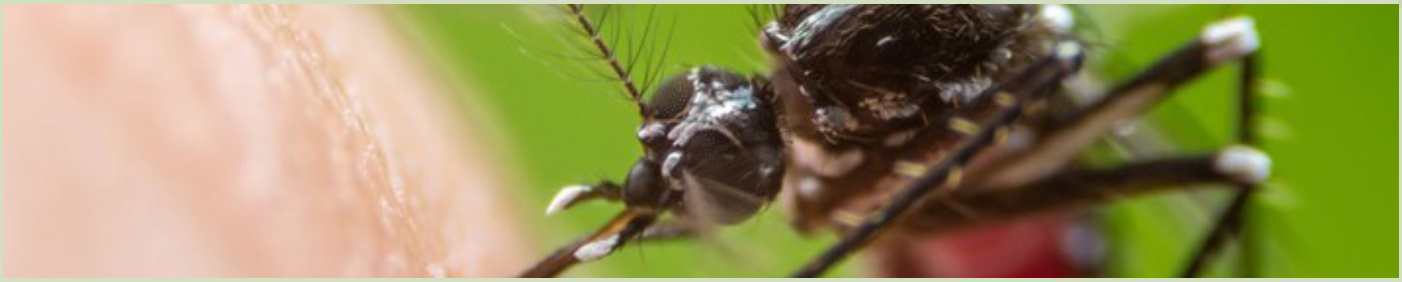
Queensland Health

Queensland Health sets state-wide strategic direction and implements actions for the prevention of and response to dengue outbreaks in Queensland. This includes:

- Reporting notifications of dengue virus infections through the electronic notifiable conditions register,
- Monitoring incidence of dengue in Queensland,
- Confirming dengue diagnoses,
- Contact tracing of dengue case travel histories,
- Oversight of emergency vector control activities,
- Supporting and assisting local government with the implementation of mosquito surveillance and control activities for dengue vectors,
- Leading and conducting public awareness activities to promote self-protective behaviours by the public, including reducing mosquito habitat around homes and businesses,
- Monitoring the distribution of dengue vectors and conducting pesticide resistance testing on dengue vectors where relevant,
- Supporting local government through the provision of expert medical entomology advice,
- Developing relevant public health legislation and monitoring/supporting its administration.

Australian Government Department of Agriculture and Water Resources

The Department of Agriculture and Water Resources conducts surveillance and control of exotic mosquitoes and spray aircraft for insects across all Australian international air and sea ports on behalf of the Department of Health.



Key Component 1 – Surveillance

Surveillance for *Aedes aegypti and Aedes albopictus* can determine vector distribution, estimate vector population density, identify productive larval habitats and define spatial and temporal risk factors related to transmission. These are used to prioritise the locations for and timing of vector control efforts.

Populations of container breeding mosquito species can be difficult to monitor due to the highly localised nature of their distribution in some locations, and complex drivers of population dynamics, including climatic factors and human behaviours.

Mosquito surveillance is conducted as regularly as required to provide meaningful comparative data. Where possible, survey data is mapped to aid visualisation of the scale of surveillance activities. This will include implementing SWARMMs data. Surveillance strategies are continually evolving as new surveillance tools become available and as the program is reviewed.

Surveillance locations

Surveillance focuses on residential and commercial premises that present the greatest public health risk and geographical hot spots.

High risk premises are those that have frequent contact with viraemic travellers, provide large numbers of mosquito larval habitats and/or represent an opportunity for large numbers of people to be infected. High risk premises are generally non-residential (e.g. high-traffic premises like backpacker accommodation which host a disproportionate number of viraemic international visitors). Conversely, individual residences, often regarded as 'key premises', may be high risk if they consistently support the production of large numbers of mosquitoes.

Potential high risk premises include:

- Older or poorly maintained households (potentially lacking air conditioning and insect screens or with gardens providing large amounts of shade and potential containers),
- Backpackers/hostels/guest houses/ caravan parks,
- Hospitals,
- Tyre dealers/wrecking yards
- Plant nurseries/ hardware stores,
- Schools (pre-schools, primary, high schools, colleges, day-care centres),
- Airport/Port Alma/transit centres
- Botanical Gardens/ Kershaw Gardens/ Heritage Village.

Geographical hot spots for potential virus transmission include:

- Older or poorly maintained areas of town with non- screened housing (especially with a history of high *Aedes aegypti* numbers),
- Highly vegetated areas that provide outdoor harbourages.
- Areas that have supported previous dengue activity,
- Areas with a high number of rainwater tanks.

Adult mosquito surveillance

Routine adult surveillance for *Aedes aegypti* is currently not undertaken by Council.

Council conducts weekly light trap monitoring however, it is not designed to monitor for breeding of *Aedes aegypti* mosquitoes as they are day biters and not attracted to the trap. These traps monitor nuisance and other mosquitoes to provide information on potential breeding area eg saltmarshes

Biogents Sentinel (BG) traps and Gravid Aedes Traps (GATs) can be used to monitor adult *Aedes aegypti* numbers in high risk areas.

Sampling the adult vector population can provide essential data regarding vector distribution, seasonal population trends, transmission risk and evaluation of vector control interventions. Adult presence can also be a reliable indicator of proximity to hidden larval habitats however it does not provide details regarding the type and availability of larval habitat

Egg surveillance

Aedes aegypti and Aedes albopictus deposit eggs in ovitraps. The identification of eggs to species level is not practical and it is often necessary to rear eggs to at least fourth instar larvae for species identification. As with adult surveillance, ovitraps do not provide details regarding the type and availability of larval habitat.

Larvae and pupae surveillance

Container surveys can be used to identify the presence of larvae and pupae breeding in water. The surveillance infers the spatial distribution of the vector and the diversity and availability of surface container habitats. Larval surveys may also provide a relative measure of density of larval habitats.

Key Component 2 – Control

The aim of controlling mosquitoes is to break the transmission cycle, by killing mosquitoes and removing their breeding sites. Adult mosquito control includes:

- Interior residual spray,
- Deployment of lethal ovitraps within specified areas,
- Barrier and/or harbourage spraying,
- Specific misting programs.

Larval control includes:

- Application of residual pyrethorids and insect growth regulators to containers capable of holding water,
- Source reduction – removal, turn upside down, fill with sand or made free-draining so not to hold water, ensure mosquito-proofing is intact of water-bearing containers eg tanks,
- Biological control (fish).

Control measures targeting adult mosquitoes have a large and immediate impact on virus transmission, whereas larval control removes the subsequent generation of mosquitoes within the affected area.

Control activities are most effective where the community actively undertakes preventative behaviours. Fewer productive larval habitats will equate to fewer vector mosquitoes and fewer mosquito bites reduce the risk of exposure to the viruses. Control methods and strategies are continually evolving as new control tools become available and as the program is reviewed.

Key Component 3 – Disease Surveillance

Routine disease surveillance is the first defence against dengue with an emphasis on overseas acquired ('imported') cases. This is important as dengue outbreaks are initiated by an often undiagnosed viraemic traveller.

Dengue is a notifiable disease under the *Public Health Act 2005*. Notification encompasses clinical and laboratory surveillance.

Doctors are required to notify Queensland Health immediately upon clinical suspicion, rather than waiting for laboratory results.

Laboratories are required to notify Queensland Health of a positive dengue result.

Early presentation and notification of cases enables action to be taken promptly to reduce the risk of local transmission.

Queensland Health regularly advises Council of vectorborne diseases notifications.

Key Component 4 – Public awareness and community engagement

The prevention of dengue is the responsibility of both government (state and local) and the public. Councils Vector Management Unit cannot eliminate mosquitoes in all homes and businesses in the Rockhampton Region, hence an important element of dengue management is raising public awareness about the community's role in eliminating mosquito harbouring at home and in the workplace as well as supporting the adoption of protective behaviours.

Public awareness campaigns and community prevention initiatives are enhanced just before and throughout the storm and wet season (September-April) and focuses on the following messages:

- Adoption of protective behaviour (e.g. use of insect repellent and PPE),
- Source reduction (e.g. clean up yards, tip out or dispose of unwanted containers, clean gutters, screen houses and water tanks etc.),
- The public's legal responsibility regarding domestic mosquito breeding.

The campaigns are designed to create and maintain awareness and motivation within the community and convey a positive view of empowerment which supports personal responsibility and action rather than creating fear or panic.

Specific campaigns are required for high risk premises.

Routine Prevention Actions

This section outlines the actions taken when there is no current dengue activity in Rockhampton.

Surveillance

Routine surveillance will be undertaken at high-risk premises, in geographical hot spots and in response to some complaints. The priority programs are:

1. Regular high risk premises survey program,
2. Property surveys in response to a mosquito complaint where the biting species has been identified as a container breeder,
3. Property surveys of geographical hotspots.

In addition, surveillance is undertaken at the Rockhampton Airport prior to and after international flights, as advised by the Airport.

The outcome of any surveillance will be discussed with the occupier and if *Aedes aegypti and Aedes albopictus* is identified, correspondence may be issued giving the occupier time to comply with legislative requirements.

Breeding identified on Council land will be treated.The presence of Aedes aegypti and Aedes albopictus will be mapped in SWARMMs, a state-wide mapping system.

Adult mosquito surveillance

BG or GAT traps may be used to identify the presence or absence of *Aedes aegypti or Aedes albopictus* at priority 1, 2 and 3 premises above. Also live adult collections.

Traps are placed at the premises and left for a specified amount of time. Traps are then collected and the species of mosquitoes caught identified. Residents are requested to collect adult mosquitoes

place them in a jar and put into their freezer which then can be collected for identification purposes.

If the presence of *Aedes aegypti or Aedes albopictus* is identified, larval and pupal surveillance will be undertaken.

Egg surveillance

The use of ovitraps will be investigated to determine whether their use adds value to routine prevention procedures.

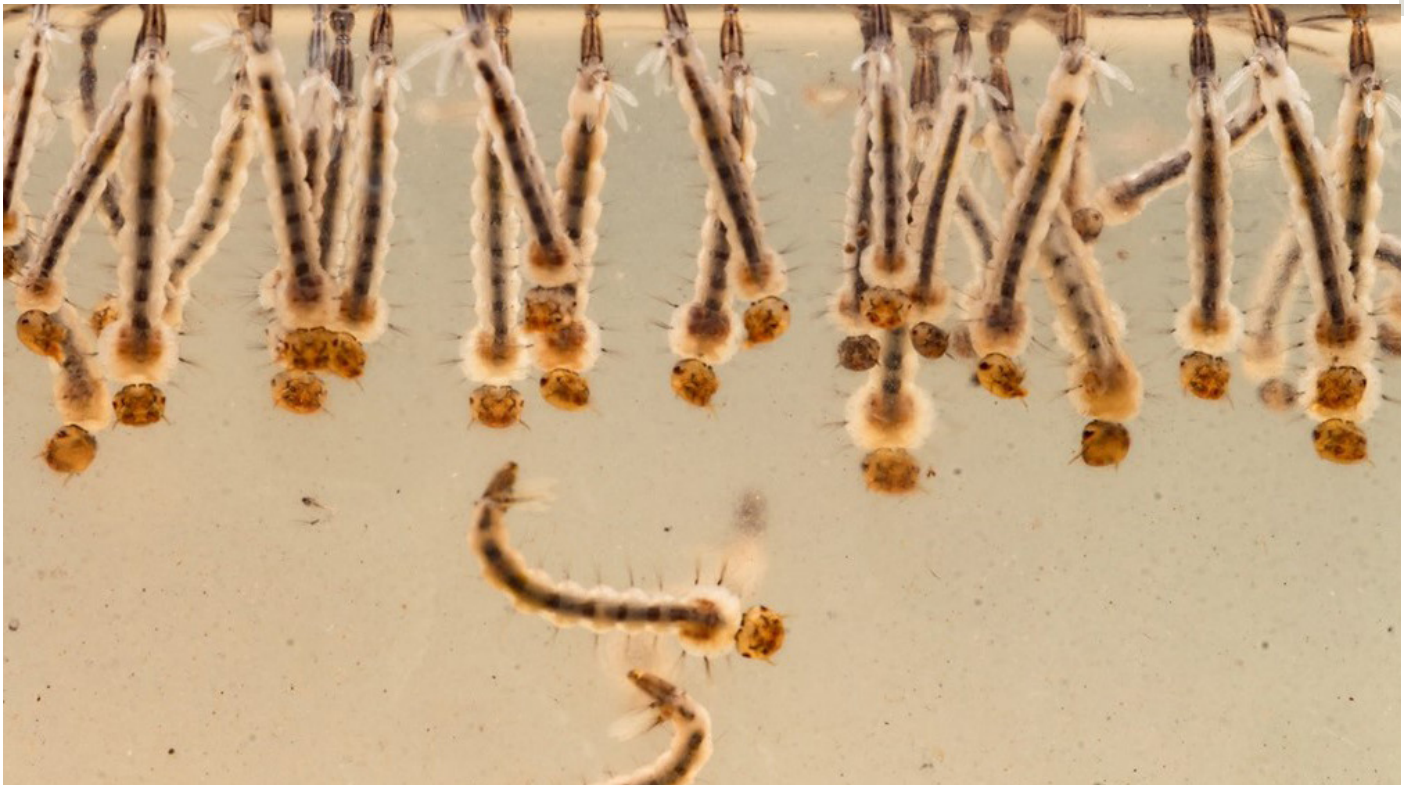
Larval and pupal surveillance

Larval and pupal surveillance will be undertaken:

- In response to a mosquito complaint where the biting species has been identified as a container breeder. The surveillance will be undertaken on a number of properties in the same vicinity of the complaints premises,
- When adult *Aedes aegypti and Aedes albopictus* have been identified through adult mosquito surveillance, at the Rockhampton Airport and a radius of 400 metres from the airport prior to and after international flights.

Through surveys containers that are breeding or could breed mosquitoes are identified and where possible source reduction is undertaken. Drones may be used to check gutters and rainwater tanks for breeding.

Larvae collected will be identified to determine the species, when required. Where possible, surveillance will be undertaken with the occupier of the premises.



Control

Larval control

Where possible, source reduction will be undertaken at the time of surveillance. Larval control activities to be undertaken by occupiers include:

- All potential breeding sites (artificial containers that collect water) in the yard and in and under the house to be emptied and rendered 'mosquito-proof' (ie. turned upside down, filled or destroyed) if possible,
- Natural breeding sites that hold stagnant water, such as tree holes and bromeliads, to be treated with insecticide, it is recommended that tree holes be filled with sand,
- Roof gutters to be kept clear so not to hold water,
- Rainwater tanks inlets and outlets to be screened (less than 1 mm aperture).

Larval control on Council land and on private properties when determined necessary is undertaken with chemicals such as S-methoprene as Altosid Pellets and Briquettes®. Costs may be recovered on private property.

Adult Control

If deemed necessary, adult control may be undertaken using ULV misting within a 200-400m radius of the property covering an area of approximately 2 standard house blocks in all directions from the primary property providing access is available to do so using an emulsion of Twilight and DC Tron.

Disease Surveillance

Queensland Health's vectorborne disease notifications are reviewed on a regular basis. Trends and internal Council reporting is conducted monthly comparing data from the previous five years.

Public Awareness and Community Engagement

Population level education strategies about dengue prevention are designed to create and maintain awareness and motivation within the community.

Messages focus on the need to eliminate *Aedes aegypti* breeding sites in and around houses, commercial premises and other public spaces, particularly prior to and during the wet season.

Key preventive messages include:

- Adoption of protective behaviour (e.g. use personal insect repellent and PPE)
- Source reduction (e.g. cleans up yards, tip out or dispose of unwanted containers, clean gutters, screen houses and water tanks etc.)
- Public legal responsibility regarding domestic mosquito breeding.

Messages are delivered through a variety of mechanisms including:

- Factsheets,
- Councils website,
- Displays at events,
- Social media,
- On-hold messages,
- Presentations,
- Property surveys,
- Vector Management Officers.

If compliance is not gained through education alone, Council sends initial notification letters and uses legislative enforcement tools to gain compliance.

Sporadic Case Response Actions

This section outlines the actions taken when there is no current dengue activity in Rockhampton, but a sporadic case has been reported to Queensland Health.

A sporadic case is an imported case of dengue (clinically suspected or confirmed),

When there is no current dengue activity it is possible locally-acquired cases are false alarms, ie the person does not have dengue fever. However, because they could be bona fide cases, they require immediate follow up and mosquito control action.

Once a locally-acquired case becomes confirmed an outbreak is declared by Queensland Health.

Queensland Health takes the lead role in a response to a sporadic case. Council works collaboratively with Queensland Health on a response to the notification.

Surveillance

Surveillance is generally undertaken within 200-400m of the dengue case contact points. Dengue case contact points are localities visited during daylight by the viraemic dengue case where contact with *Aedes aegypti* was possible (eg. residence, place of business, school).

Councils Vector Management Officers and Environmental Health Officers undertake surveillance with Queensland Health officers.

An approved inspection program may be initiated by Queensland Health.

Control

The aim of mosquito control in response to a sporadic dengue case is to thoroughly control *Aedes aegypti* within 200-400m of the dengue case contact points.

Larval Control

Larval control is conducted at all premises within a 200- 400m radius of the dengue case and potentially case contact points at the time surveillance is undertaken.

The control involves the elimination and treatment of all active and potential breeding sites and consists of destroying or removing unwanted containers and treating others with chemicals such as S-methoprene as Altosid Pellets®.

Adult Control - Interior Spraying

A residual insecticide may be applied as a surface spray in premises in the immediate vicinity (100m) of the case contact points.

Where treatments are undertaken for larva or adults occupants are provided a Pest Control Advice as required by legislation.

This advice details the chemicals used, safety procedures and how to report any adverse health effects. Permission to spray is sought before treating. Spray is applied to typical Aedes aegypti resting sites such as dark corners, under and inside furniture, and to dark objects.

Council's Vector Management Officers generally undertake interior spraying with Queensland Health Officers.

Adult Control – Property Exterior Misting

Property exterior misting may be undertaken. Councils Vector Management Officers would work with Queensland Health in determining if misting the property is required taking in to account possible effectiveness, size of the property, extent of mosquito harbourages and sensitivity of the area.

Adult Control – General Misting

Council's Vector Management Officers may undertake misting programs within a 400m radius of case contact points using an emulsion of Twilight and DC Tron independent of Queensland Health response. General misting is conducted from the roadway only.

Public Awareness and Community Engagement

Sporadic case response publicity is led by Queensland Health, Council may support publicity where requested.

The role of education in response to sporadic cases is specifically targeted at occupants of premises in the immediate vicinity of the case contact points to heighten awareness of the risk of local transmission of dengue fever and urge occupants to take urgent steps to control Aedes aegypti and subsequently decrease the risk of transmission. This is undertaken by the officers who attend the premises.

Outbreak Response Actions

One case of locally acquired dengue constitutes an outbreak. During an outbreak, the bulk of dengue action response is geared towards locations where there is recent dengue activity, especially clusters of cases rather than individual cases. Mosquito control responses are planned by Queensland Health with assistance from Queensland Health's entomologist and with assistance and in collaboration with Council.

Surveillance

Surveillance procedures are comparable to those for a sporadic case however surveillance is undertaken over a wider area and usually incorporates an approved inspection program. Councils Vector Management Officers and Environmental Health Officers undertake surveillance with Queensland Health officers.

Control

Larval Control

Larval control procedures are comparable to those for a sporadic case. Emphasis during a multiple-case outbreak is control over a larger area, including all premises with dengue activity. Thus, collaboration between Council and Queensland Health is especially critical.

Larval control is generally undertaken at the time the properties are surveyed. For outbreaks with numerous cases over a broad area, the entire area is subject to larval control.

Adult Control - Interior Spraying

Interior spraying is especially important during a large outbreak. Numerous viraemic people equate to numerous viraemic mosquitoes. The residence and adjacent premises of each dengue case should be sprayed to minimise the number of bloodfed Aedes aegypti that survive to transmit dengue. In many instances, the place of business or even acquaintances' homes may need treating.

For outbreaks with numerous cases over a broad area, the entire area is subject to adult control. Occupier consent is required when interior spraying a premises.

Adult Control – Property Exterior Misting

Property exterior misting may be undertaken. Councils Vector Management Officers would assist Queensland Health in property misting.

Adult Control - General Misting

Council's Vector Management Officers may undertake broad range misting programs independent of Queensland Health response.
General misting is conducted from the roadway only.

Public Awareness and Community Engagement

During an outbreak, educational activities aim to heighten public perception of immediate risk and motivate the public to take action.

Review and performance reporting

The Plan will be reviewed mid-term to ensure that it identifies and reflects changing priorities, operational capacity and the legislative framework and has been afforded adequate financial and staffing resources.

Appropriate reporting frameworks will be put in place to ensure management can monitor performance and adjust operational effort according to circumstances.

Action Plan

Actions	When	Success Indicator
Develop and implement a high risk premises/ locations dengue management program	December 2023	Program developed
	June 2024	Program implemented
Document and maintain the premises to premises program	December 2023	Program documented
	June 2024	Program undertaken
Maintain the airport management program	Ongoing	Program undertaken
Review surveillance programs	Annually	Surveillance programs reviewed and changes implemented
Review control programs	Annually	Control programs reviewed and changes implemented
Research new surveillance methods and evaluate for use	Ongoing	Surveillance methods identified and evaluated for use
Research new control methods and evaluate for use	Ongoing	Control methods identified and evaluated for use
Undertake enforcement actions	As required	Enforcement actions undertaken
Develop work instructions associated with the plan	Ongoing as identified	Work instruction developed
Implement Dengue related actions in the Community Education Strategy (includes education material, displays and school programs)	Annually	Community Education Strategy implemented
Source and provide relevant training to vector management officers in relation to dengue management and best management practices	Ongoing	Training identified and attended
Vector management officer attendance at conferences, workshops, forums, regional and stakeholder meetings	As appropriate	Conference, workshops and forums, regional and stakeholder meetings identified and attended

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