

# Medical Officer of Health Environmental Health ADVICE

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## **Introduction**

In the previous issue of EH Advice we provided information on poisonous plants in New Zealand and on asbestos and the safe disposal of asbestos-containing material.

This issue deals with plumbosolvency - the ability of water to dissolve metals. In public water supplies this is an undesirable property and tends to occur more in older premises.

There is also an article on work being done to keep Dengue fever under control in New Zealand - an important biosecurity issue for this country.

The final article covers beach safety tips for this summer and some other important measures for staying safe in the summer months.

## **Plumbosolvency**

*Author: Shannon Palmer, Drinking Water Assessor/ Health Protection Officer*

Plumbosolvency refers to the ability of solvents, such as water, to dissolve metals that they come into contact with. This can be an issue for public drinking-water supplies that are slightly acidic, as they have the ability to dissolve small amounts of heavy metals (such as lead, nickel, cadmium and copper) from (usually older) household pipes and plumbing fittings. As a result, slightly elevated levels of heavy metals may be found in drinking-water that has been sitting in household pipes for a prolonged period.

All drinking-water supplies in New Zealand are considered to be plumbosolvent until the drinking-water supplier demonstrates otherwise.

For drinking-water supplies considered to be plumbosolvent, the Drinking Water Standards for New Zealand (DWSNZ)

require that the drinking-water supplier alert residents to the issue of plumbosolvency. For drinking-water supplies serving greater than 500 people, this is done by issuing a public health warning to all customers at least twice a year, for example, with each water supply bill or water rates demand.

Infants, children and pregnant women are more susceptible to the toxic effects of heavy metals, so steps should be taken to reduce heavy metal concentrations in drinking-water that may be consumed by this group.

The Ministry of Health (MoH) believes that the risk from heavy metals in drinking-water is small. However, as a precaution, the MoH recommends that all households flush a mugful (approximately 500ml) of water from their drinking-water tap each morning (or when the water has been unused for a period of time) to reduce the risk.

## **Biosecurity: Working harder to keep Dengue Vectors under Control in New Zealand**

*Author: Shaun Yu, Health Protection Officer / Authorised Biosecurity Officer*

Dengue is a mosquito-borne virus that has become a major public health concern worldwide in recent decades. Dengue fever is a disease caused by the dengue virus, of which there are four serotypes<sup>3</sup>. Geographically, dengue is found in tropical and sub-tropical regions such as Africa, South East Asia, the Caribbean and South America, Australia and the Pacific islands (Figure 1). Potentially, about 40% of the world's population (some 2.5 billion) are now at risk of infection<sup>1</sup>. First recognised in the 1950s during Dengue epidemics in Thailand and The Philippines, dengue haemorrhagic fever (DHF) is a potentially lethal complication characterised by internal bleeding that may lead to shock, and has become

a leading cause of hospitalisation and death among children in the affected region. DHF occurs when a person catches a different serotype of dengue virus after being infected by another one some time in the past.

### **Background**

Across the Tasman, dengue outbreaks are recorded during the summer season each year. Queensland is among the heaviest dengue-affected region in Australia. From December 2008 to June 2009, Queensland Health recorded and responded to its largest dengue outbreak, with 993 confirmed cases and one death. To deal with the outbreak, Queensland

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Health cleared or treated 106,000 breeding sites, visited 48,000+ properties, sprayed ~6,000 interior surfaces, and delivered ~23,600 letters to Cairns residents during the period<sup>2, 4</sup>.

Dengue fever is becoming more common with a steady increase in cases confirmed each year. Between 1997 and 2008, an average of 16 cases was notified in the Auckland region each year. In 2007 alone, this figure jumped to 93 cases. Most of the cases were in Pacific people returning from visiting friends and family in the Pacific. An outbreak occurred in the Cook Islands in 2007, and in 2008 there were outbreaks in the South Pacific in Tonga, Samoa and Fiji. Dengue fever is likely to be an ongoing public health problem in the Pacific, and potentially in Auckland, with climate change increasing the suitability of habitat for exotic mosquitoes.

Two mosquito species are particularly important vectors for the spread of Dengue fever, *Aedes aegypti* and *Aedes albopictus*, also known as the dengue mosquito and Asian tiger mosquito, respectively. Within 8-12 days of biting an infected person, a mosquito is able to transmit dengue to other people. As more people are infected, more mosquitoes become infected by dengue virus and further transmit the disease (Figure 2).

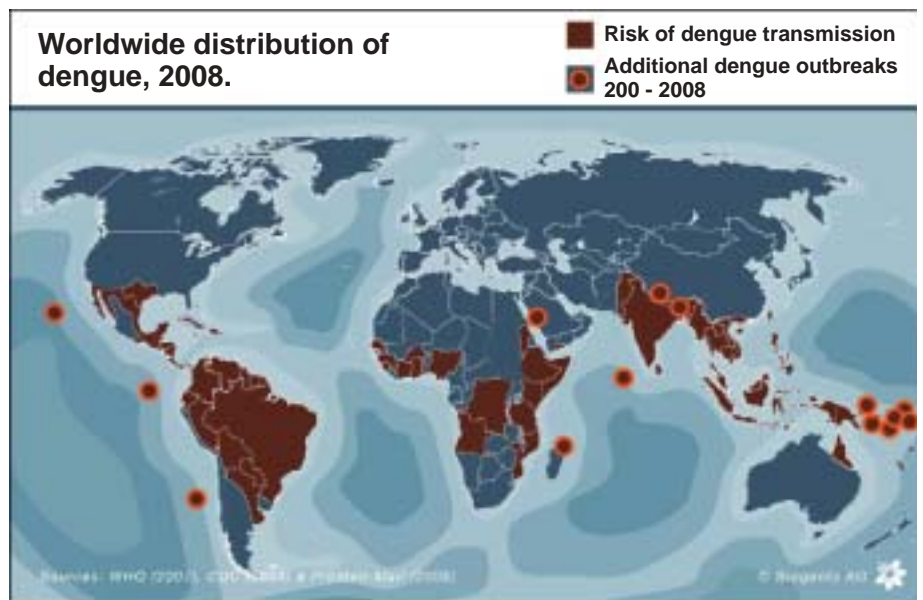


**Figure 2: Major dengue vector: *Aedes aegypti* and *Aedes albopictus***  
(source: University of Florida, 1999)

### New Zealand Situation

Currently, New Zealand's cool climate is relatively unsuitable for dengue mosquitoes' survival, although this will change as the climate warms. Despite the increasing number of dengue cases in returning travellers notified to medical officers of health in recent years<sup>3</sup>, local spread of infection has been unable to occur. This is because the mosquito vector, *Aedes aegypti*, has not become established in New Zealand, largely due to surveillance and control programmes run by the Ministry of Health and operated by public health units with assistance from MAF Biosecurity NZ and staff at international air and sea ports.

As the most important industrial and commercial hub in New Zealand, Auckland has increasingly become the leading gateway for exotic mosquitoes, including both *Aedes aegypti* and *Aedes albopictus* (Figure 2), which frequently arrive here in import cargo from main seaports and airports. These routes of entry have resulted in the *Aedes albopictus* mosquito being intercepted multiple times, however, entomological surveillance programmes in place around international NZ seaports



**Figure 1: Global dengue distribution 2008** (source: WHO, 2007)

and airports have, to date, resulted in successful interception responses. Over the last three years, in Auckland alone, *Aedes aegypti* and *Aedes albopictus* have been identified from these sources: imported used machinery and decks of vehicle carriers at Ports of Auckland (POAL), MAF Quarantine areas, the Arrivals Hall at Auckland International Airport (AIAL), and MAF-approved transitional facilities (TF) (Table 1).

**Table 1: Dengue mosquitoes intercepted in Auckland 2007-2009\***

Year	Date	Mosquito Species		Sample Type	Location / Risk Items
		<i>Aedes aegypti</i>	<i>Aedes albopictus</i>		
2009	07/01	✓		Adult	Fresh taro (ex Fiji) @ TF, Penrose
	26/02	✓		Adult	MAF Search Bench with unknown source @ AIAL
2008	16/01		✓	Larvae	Sewage truck (ex Japan) @ POAL
	11/04	✓		Larvae	Used boat (ex Vanuatu) @ POAL
2007	01/01		✓	Larvae	Used boats, trailers and equipment (ex Fiji / Cook Islands) @ POAL
	04/01		✓	Larvae	Garbage truck (ex Japan) @ POAL
	14/01	✓		Larvae	Cargo hatch covers (ex Cook Islands) @ POAL
	05/03		✓	Adult	ARPHS mosquito surveillance trap @ POAL

\* Abstracted from the biosecurity database, Border Protection Team, ARPHS (2007-2009).

### How can dengue fever be prevented when travelling overseas?

There is no vaccine to protect against dengue fever, and no drugs you can take to prevent it (as you can with malaria). However, there are things you can do to protect yourself:

- ▶ Wear clothing that covers the arms and legs
- ▶ Wear hats and shoes (rather than sandals)
- ▶ Apply insect repellent to skin. The most effective repellents are those containing DEET (diethyl toluamide) – at a concentration of between 30 to 50%
- ▶ Apply permethrin insecticide to clothes
- ▶ Use mosquito nets impregnated with permethrin
- ▶ Use electric insect-repellent devices, or mosquito coils
- ▶ When possible, stay in accommodation that has screens on doors and windows, or is air-conditioned

#### References

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- 4 Montgomery, Brian L (2009). Dengue (DENV-3) Epidemic Dec 2008-2009 - A North Queensland Disaster. *Mosquito Bites in the Asia Pacific Region*. 4 (1): 10-17.

# Summer Safety: water and sun

Author: Shan Shan Li, Technical Officer

New Zealand's beaches are admired the world over for their beauty - but they can also be dangerous. Each year, thousands of people visit beaches to enjoy the recreational opportunities they provide, so it is important to be aware of both the potential dangers associated with beaches and how to keep safe. By following a few simple rules, your day at the beach can be safe and enjoyable for all.

## 1. Sea water quality

Pick a beach that is tested regularly for cleanliness and keep an eye on public beach safety notices. In Auckland, more than 50 beaches are jointly monitored by the Auckland Regional Council and district councils. They update beach information weekly and can be accessed 24 hours a day by calling 0800 SAFESWIM (0800 72 33 79) or by visiting the council website.

The following is some general advice for using beaches safely:

- ▶ Wait at least 48 hours after heavy rainfall before swimming. Heavy rains can stir up polluted sediment and cause sewage systems to overflow into storm drains that then discharge into seawater.
- ▶ If possible, choose beaches that have a good turn-over of water which ensures that any pollutants are flushed out to sea.
- ▶ Avoid swimming in beach water that is cloudy or smells bad. If you can't see your feet, don't put your head under the water.
- ▶ Avoid swimming near storm drains or sewage outfall pipes.
- ▶ Avoid contact with any foreign objects and other obvious pollutants such as oil slicks.
- ▶ Check out the surrounding environment and avoid areas where contamination is likely, for instance, close to farmland where pesticides, fertilisers, other chemicals and manure may run off into the surrounding water.

## 2. Tetrodotoxin –TTX

Since July, approximately 15 dogs from a wide geographic area within the Hauraki Gulf became unwell with symptoms consistent with tetrodotoxin (TTX) poisoning. Six of the dogs died. Tetrodotoxin is an extremely potent neurotoxin found in several marine species including tropical puffer fish, and was recently identified in sea slugs taken from an Auckland beach. Its presence was also confirmed in the vomitus of one of the dead dogs, leading to the conclusion that dogs had died or become ill after eating sea slugs containing TTX. This is the first time TTX has been identified in a marine organism in New Zealand, and is the first time TTX has been identified in soft-bodied sea slugs internationally. Ongoing work seeks to uncover whether the TTX found in sea slugs came from an environmental source or was produced endogenously by the sea slugs.

Early symptoms of TTX poisoning include numbness and tingling around the mouth, and nausea. This numbness and tingling may then spread to the face, tongue and other areas, with paralysis, incoordination and slurred speech. The public are advised to seek medical attention without delay if becoming unwell after going to the beach – particularly after contact with a sea slug.

With warmer weather and longer evenings, more people will be out and about on some of our beautiful Auckland beaches. The public are advised to be cautious about what they handle on any Hauraki Gulf beach. In particular:

- ▶ Children and pets need to be on all Hauraki Gulf beaches.
- ▶ Adults, children and pets should not eat anything found washed up on any Hauraki Gulf beach.
- ▶ Parents need to be aware of where their children are swimming or playing and what they are handling.
- ▶ Sea slugs should be avoided. Let the local city council know if you come across any sea slugs on the beach.

## 3. Blue-green Algae

Blue-green algae, technically known as cyanobacteria, are microscopic organisms that are naturally present in lakes and streams. Some blue-green algae produce toxins that could pose a health risk to people and animals when they are exposed to them in large enough quantities. Health effects could occur when water containing high levels of blue-green algae containing toxins is swallowed, contacts the skin, or is inhaled from airborne droplets while swimming, bathing or showering. We recommend that the following advice is followed:

- ▶ Never drink untreated surface water, whether or not algal blooms are present.
- ▶ Rinse dishes washed in untreated surface water with bottled water to reduce any harmful residues.
- ▶ People and pets should avoid contact with water that is discoloured until advised otherwise. Seek medical attention if symptoms such as skin, eye or throat irritation, breathing difficulties, or any other allergic reaction occur after contact with untreated surface water.

## 4. SunSmart Behaviour

New Zealand and Australia have the highest melanoma rates in the world. Each year, around 2000 New Zealanders develop melanoma and another 250 people die from it. While melanoma is the most serious type, there are another approximately 67,000 other skin cancers each year. Over-exposure to the sun's ultraviolet radiation (UVR) is the cause of over 90% of all skin cancer - making prevention and early detection of skin cancer key health goals. Here are some essential SunSmart tips:

Between September and April, especially between 11am and 4pm:

- ▶ Cover up well and wear a broad - brimmed bucket or legionnaire style hat to protect the face, ears, and the back of the neck, and use sunglasses.
- ▶ Apply SPF 30+ broad-spectrum sunscreen thickly and evenly to exposed skin 20 minutes before going out into the sun and reapply every two hours.
- ▶ Sunscreen should be used in addition to shade and clothing, not as a substitute for it.
- ▶ Stay in full shade as much as possible around the middle of the day.

### Joey Chan



Joey Chang has joined the Healthy Environments Team as a Technical Officer. Joey has a Masters in Public Health from the University of Auckland, and is currently undertaking a graduate diploma in Environmental Health at Massey University. He has previously worked in the health promotion programme evaluation field. His portfolios include monitoring the importation of materials used for graphics, anthrax prevention and biosecurity.