Frequently Asked Questions

1. What is Cetacean Morbillivirus (CeMV)?

Cetacean morbillivirus or CeMV is a naturally occurring viral disease that affects a wide range of cetacean species (both toothed and baleen species i.e. dolphins, porpoises and some whale species). It is the most significant natural cause of cetacean sickness/death globally, with multiple outbreaks documented worldwide – most commonly in the Mediterranean Sea and the Atlantic Ocean.

CeMV is caused by a group of virus strains that originate from a single virus species. These strains are related to viruses that occur in other species like dogs, seals, cattle, pigs, giraffes, camels, deer, goats, sheep, and humans (measles virus). CeMV is most closely related to the viruses in goats, sheep, cattle and pigs.

CeMV only affects cetaceans, not other species. **Humans are not at risk.**

2. How many dolphins have died from CeMV in this unusual mortality event in 2019, and how does it compare to 2009?

As of July 2019, it has been established that five dolphins in the Perth region have died due to CeMV, between February to May 2019. They include two Swan Canning Riverpark residents, Zari and Echo, a striped dolphin that died in the Swan River, and two unknown Indo-Pacific bottlenose dolphins that died at Coogee Beach and Floreat Beach.

In 2009, six Swan Canning Riverpark resident dolphins died over a five month period. Two of the animals tested positive for CeMV. Although it is suspected that CeMV played a part in the deaths of all six, testing was inconclusive for the other four animals due to various confounding issues.

It appears that this virus has resurfaced in dolphins in Perth waters 10 years on from the first documented occurrence.

No reports of the virus have come from areas outside the Perth region.

3. How does CeMV spread, i.e. how is it transmitted from one animal to the next?

Research carried out overseas and in eastern Australia indicates that the virus is present naturally at a baseline level within some of the off-shore pelagic species, such as pilot whales and possibly melon-headed whales. These animals are highly social and frequently travel in large groups, meaning the virus can continue to survive in whale groups.

It is likely that when such species make periodic incursions closer in-shore (e.g. foraging, stranding if sick), they may come in close contact with in-shore/resident estuarine dolphins and other cetaceans, who are very social and inquisitive.

As the virus is highly transmissible, it can then spread from animal to animal via infected particles they breathe out in their blow, with another animal then breathing them in (much like the way humans can catch respiratory viruses like colds). Although this respiratory route is the most important mode of transmission, there is also evidence the virus can spread from mother to foetus/calf. The virus cannot survive in the environment outside of a cetacean host.

4. What does the virus do once it is transmitted to a new host?

The virus suppresses the immune system, as well as causing damage to the lungs and/or the brain in a lot of cases. The outcome largely depends on the immune status of the affected animal; however, it is a very severe, deadly disease in most cases. Many animals die within a short timeframe, some last longer (weeks or even months) only to then succumb to secondary bacterial and/or fungal infections they are no longer able to fight off.

Animals that survive infection are likely to then be immune to the virus for several years until natural immunity wanes. Carriers are unlikely to exist.

5. Why has it been 10 years since it was last seen in Perth dolphins?

It is thought that after 2009 those animals that survived exposure to CeMV developed natural immunity. However, this decreases over time, and at the 10-year mark there will be animals that:

(a) were originally exposed but are now no longer immune as their antibody levels have waned, and/or

(b) there are new animals in the population that were born after 2009 that have no natural immunity i.e. are immunologically ‘naïve’ and are therefore susceptible when they come in contact with the virus for the first time.

This cyclical pattern has also been seen in other countries.

6. Why do affected animals strand, and what clinical signs might they show?

Affected animals are extremely sick - usually terminally so. They strand because they can no longer keep their balance, swim, echolocate, see, hunt for food, and/or breathe properly, therefore becoming very weak and disoriented.

They often exhibit:

- abnormal behaviour (e.g. no avoidance of people, minimal response to being handled);
- neurological signs (unable to swim upright/straight/avoid obstacles, swimming in circles, unable to surface properly to breathe, reduced/abnormal reflexes);
- abnormally fast and laboured breathing;
- weight loss; and
- skin and oral lesions/erosions.

7. What should people do if they see a stranded dolphin or whale?

Take note of the time and location (a time stamped photo and GPS pin drop can be done on most smart phones to assist) and **call the Department of Biodiversity, Conservation and Attractions' (DBCA) Wildcare Helpline on 9474 9055**. They will be able to determine the next best course of action and the appropriate DBCA staff member to assist. Please be aware of your safety – such animals are quite heavy and can be distressed, often moving suddenly and erratically.

8. Can CeMV be treated?

Unfortunately, there is no effective treatment. This is a naturally occurring disease for which there is no vaccine, nor any effective means of treating affected animals.

9. How much longer do you expect CeMV related deaths to go on for? How many more animals do you expect to lose?

It impossible to say. It is not known what the immune status of the resident and coastal dolphin populations is with respect to which animals have natural immunity and if so, to what extent. Additionally, the disease presentation is quite variable with regard to timeframe as well as its manifestations.

CeMV cases can present rapidly as an acute illness, however some individuals survive the acute phase, instead developing fatal secondary bacterial/fungal/parasitic infections and chronic encephalitis weeks or even months after the initial infection.

Dr Nahiid Stephens from Murdoch University has indicated that if three months passes without a case of the virus then the particular CeMV event is likely to be over. However, it is important to note this disease is naturally occurring and may therefore crop up periodically in a wild population that has contact with other gregarious individuals/social groups.

10. What can we do to help dolphins, whales and other marine fauna?

We can help by reducing/mitigating other potential sources of chronic stress that can adversely impact the health of marine fauna (e.g. fishing line/debris entanglements and plastic pollution) with responsible waste management and volunteer clean up days.

You can also become involved in the department's River Guardians program and projects such as *Dolphin Watch* and *Reel it in*.

The *Dolphin Watch* project is a partnership between DBCA's River Guardians program, and Murdoch and Edith Cowan universities. It was launched in 2009 to learn more about the community of bottlenose dolphins residing in the Swan and

Canning rivers. The project was successfully expanded to Mandurah and Broome in 2017.

Members of the public can attend a free Dolphin Watch training event held annually in each of these regions and become trained Dolphin Watch volunteers - citizen scientists contributing to the preservation of our precious dolphins.