

Sentinel Chicken Surveillance Programme in Australia, 1 July 2001 to 30 June 2002

Annette K Broom,¹ Peter I Whelan,² Joe Azuolas,³ Dominic Dwyer,⁴ Linda Hueston,⁴ John S Mackenzie,⁵
Lorna Melville,⁶ Scott A Ritchie,⁷ David W Smith⁸

Abstract

Detection of flavivirus seroconversions in sentinel chicken flocks located throughout Australia is used to provide an early warning of increased levels of Murray Valley encephalitis (MVE) and Kunjin virus activity in the region. During the 2001/2002 season low levels of flavivirus activity were detected in northern Australia compared to previous years. MVE and Kunjin virus activity was detected in the Kimberley and Pilbara regions of Western Australia and the Northern Territory but not in north Queensland, New South Wales or Victoria. This is in contrast to the previous season when MVE activity was detected both in northern Australia and, for the first time in over 20 years, in New South Wales. Two cases of Murray Valley encephalitis were reported from the north of Western Australia during the 2001/2002 wet season. *Commun Dis Intell* 2002;26:428-429.



Keywords: disease surveillance, Murray Valley encephalitis, kunjin, flavivirus

Introduction

The Sentinel Chicken Surveillance Programme is used to provide an early warning of increased flavivirus activity in Australia. The main viruses of concern are Murray Valley encephalitis (MVE) and Kunjin (KUN) viruses. MVE virus causes the disease Murray Valley encephalitis (formerly known as Australian encephalitis), a potentially fatal disease in humans. Encephalitis is less frequent in cases of Kunjin virus infection and these encephalitis cases have a lower rate of severe sequelae. These viruses are enzootic in the Kimberley region of Western Australia and in the Top End of the Northern Territory and possibly in far north Queensland (Western Cape and Gulf country). They are epizootic in the Pilbara, Gascoyne and Midwest regions of Western Australia, central Australia and in western and central Queensland. MVE virus is also responsible for occasional severe epidemics of encephalitis in south-eastern Australia, the most recent occurring in 1974.

In the northern areas of Australia, MVE and KUN virus activity varies depending on the extent and location of wet season rainfall and flooding in the region. Record rainfall was recorded in the north of

Australia during the 1999/2000 wet season and cases of Murray Valley encephalitis were reported from both central Australia and Western Australia. In 2000/2001 MVE activity was detected in New South Wales for the first time since 1974 but no cases were reported. However, cases were reported from central Queensland and central Australia in 2000/2001. Kunjin virus activity was also detected in New South Wales and Victoria in 2000/2001.

MVE and KUN virus activity is monitored in Australia by detecting seroconversions in sentinel chicken flocks.¹ Since 1974, a number of sentinel chicken flocks have been established in 5 Australian states to provide an early warning of increased MVE virus activity. These programs are funded by individual state health departments and each state has a contingency plan, which will be implemented if one or more chickens in a flock seroconverts to MVE virus. From 1992 to 2001 the results of the state sentinel chicken programs were reported bimonthly in *Communicable Diseases Intelligence*. In 2002 important results were posted on the Communicable Diseases Australia website for each State and this report is a brief summary of the results obtained from the individual state programs.

1. Department of Microbiology, The University of Western Australia, WA
2. Department of Health and Community Services, NT
3. Veterinary Research Institute, VIC
4. Virology Department, Westmead Hospital, NSW
5. Department of Microbiology, The University of Queensland, QLD
6. Berrimah Agricultural Research Centre, NT
7. Cairns Tropical Public Health Unit, Cairns, QLD
8. Perth PathCentre, WA

Corresponding author: Dr Annette Broom, Senior Research Officer, Department of Microbiology, University of Western Australia, Nedlands WA 6907. Telephone: + 61 8 9346 2213. Facsimile: + 61 8 9346 2912. E-mail: abroom@cyllene.uwa.edu.au.

Currently, 30 flocks are maintained in the north of Western Australia, eight in the Northern Territory, 10 in New South Wales, 10 in Victoria and two in northern Queensland. The flocks in Western Australia and the Northern Territory are sampled and tested all year round but those in New South Wales and Victoria are tested only in the summer months, during the main MVE risk season. Two flocks were established in northern Queensland (Mount Isa and Normanton) early in 2002 after a fatal human case of Murray Valley encephalitis was reported from Mt Isa during the 2000/2001 wet season. These chickens were tested weekly from January to June 2002. All flock locations, except Queensland, were presented earlier in *Communicable Diseases Intelligence*.¹

Western Australia

Sentinel flocks in Western Australia are tested for flaviviruses fortnightly during the 'high risk' period (November to May) and monthly at other times. Overall, low-level MVE and KUN virus activity was detected in the Kimberley and Pilbara regions in the north of Western Australia during the 2001/2002 wet season and the majority of seroconversions in both regions was due to MVE virus.

MVE activity was first detected in December 2001 at Kununurra in the north-east Kimberley and seroconversions to both MVE and KUN viruses were detected later in December at 3 sites in the West Kimberley. The first health warning was issued by the Department of Health, Western Australia (DoH, WA) in December and a human case of Murray Valley encephalitis was reported from Kununurra in late December 2001. MVE activity spread throughout the Kimberley region in January and February and a second, as yet unconfirmed case was reported from the West Kimberley in early March 2002.

MVE activity spread to the Pilbara in March and initially activity was restricted mainly to flocks located at 2 large dams (Harding Dam near Karratha and Ophthalmia Dam near Newman). Activity spread to other areas of the Pilbara in April and May 2002. This low-level activity continued throughout both northern regions from April to early June. In response to these results additional health warnings were issued to residents and visitors to the north of the State by DoH, WA in February, March and May 2002. To date activity has not spread to the coastal area of Exmouth in the Pilbara and no activity has been detected further south or east in the Gascoyne, Murchison, Midwest, Goldfields and Wheatbelt regions.

Northern Territory

MVE activity is usually initiated later in the Northern Territory than in Western Australia. The flocks are bled monthly by veterinary officers of the Department of Business Industry and Resource Development and volunteers and the serum samples tested by staff of the Arbovirus Surveillance and Research Laboratory in Perth. The first MVE seroconversions were detected in February 2002 at Tennant Creek. MVE activity spread to Alice Springs and Katherine in March. Kunjin virus activity was detected in the Darwin region (Howard Springs) and Katherine region in March 2002 and this activity continued at Howard Springs, Leanyer and Beatrice Hill to May. Media warnings were issued by the Northern Territory Department of Health and Community Services in December 2001 after the first heavy rains and in February, April, May and June 2002 after sentinel chicken seroconversions and rises in vector numbers in different areas of the Northern Territory.

There was one case of MVE in the Top End with onset in July 2001 in the Mudginberri/Oenpelli area, but this was part of the previous year virus activity. No other cases of MVE were recorded in the Northern Territory, in contrast to the previous year with 2 cases each of Murray Valley encephalitis and Kunjin encephalitis in the Alice Springs locality. The absence of cases and reduced MVE seroconversions in Alice Springs is thought to be due to an extensive insecticide application and drainage measures of Ilparpa swamp on the outskirts of Alice Springs. This resulted in a significant drop in vector numbers compared with the previous year.

North Queensland

The 2 sites in Queensland were monitored weekly for 6 months (January to June 2002) but no flavivirus antibodies were detected.

New South Wales and Victoria

Samples from sentinel chicken flocks were tested weekly for flavivirus antibodies in New South Wales from December 2001 to April 2002 and in Victoria from October 2001 to March 2002. In the 2001/2002 season no MVE or KUN virus activity was detected in these regions. This is in contrast to the previous season when both MVE and KUN virus antibodies were detected in sentinel flocks.

Reference

1. Spencer JD, Azuolas J, Broom AK, Buick TD, Curry B, Daniels PW, et al. Murray Valley encephalitis virus surveillance and control initiatives in Australia. *Commun Dis Intell* 2001;25:33-47.