

CHAPTER 5: DISEASES SPREAD BY INSECTS

Highlights

- In Peel, approximately 2 to 6 cases of malaria per 100,000 population are reported each year, with the exception of 1996 and 1997 when a dramatic increase in incidence was noted (16.4 and 15.6 cases per 100,000 respectively). Travel to or immigration from the Punjab, India, which was experiencing a malaria outbreak, was a probable cause for this increase.⁴² However, the increased incidence was much higher in Peel compared to either Ontario or Canada.⁴³
- Locally acquired cases of West Nile Virus (WNV) occurred for the first time in 2002 with a total count of 57 in Peel. Since then, the disease definition has been changed. In 2003, there were 10 Peel residents infected with WNV. No human cases were reported in 2004.

INTRODUCTION

Diseases spread by insects are caused by bacteria, parasites and viruses. Blood feeding insects such as fleas, mosquitoes, midges and sandflies transmit these diseases. Although some insect-borne diseases can be transmitted from person-to-person or through blood, this is not their main mode of transmission. Many insect-borne diseases are major health problems for developing countries. Malaria is estimated to infect over 300 million people, killing one million per year.^{44,45}

Fortunately, many insect-borne diseases are so rare in Ontario that they are not required to be reported. The reportable insect-borne diseases in Ontario are: viral hemorrhagic fevers, Lyme disease, malaria, plague, Q fever, West Nile Virus and yellow fever. In Peel, only two of these diseases averaged more than five cases per year. The first is malaria, acquired in areas of the world where this disease occurs from the bite of an infected mosquito. The second, also spread by mosquitoes, is a new disease to Peel: West Nile Virus. West Nile Virus was acquired locally for the first time in 2002. The extent to which it will affect Peel residents in the future is unknown.

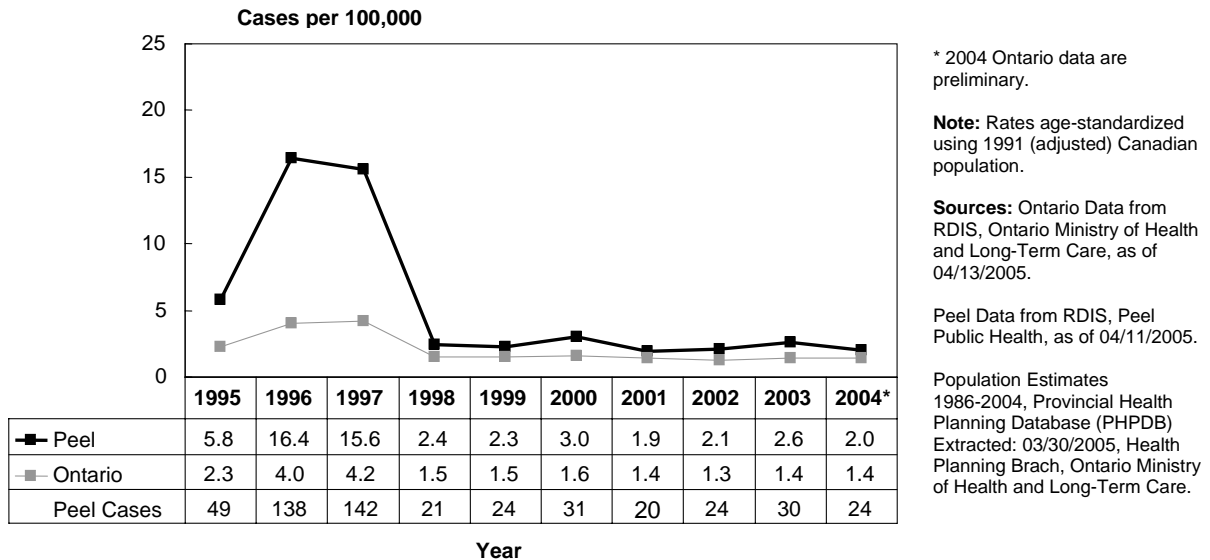
MALARIA

Malaria remains one of the world’s most important and widespread fatal infectious diseases. It is caused by one of four parasite species of the genus *Plasmodium*.

The disease is transmitted to humans through a bite of an infected female *Anopheles* mosquito. While rare, the parasite can also be transmitted by transfusion with infected blood, shared needle use, or from a mother to her unborn child. Symptoms of malaria are non-specific and include fever, chills, headache, nausea, vomiting, muscle pain and malaise.^{6,44}

Malaria is endemic (i.e. constantly present) in the tropical and subtropical parts of the world.⁴² Nearly all cases of malaria in Canada occur in people who have lived in or travelled to areas where malaria is common. The 1995 to 1997 epidemic in Canada was probably associated with Canadians travelling to the Punjab, India, which was experiencing an outbreak of malaria.⁴²

Figure 5.1: Incidence of Malaria, Region of Peel and Ontario, 1995-2004



WEST NILE VIRUS (WNV)

West Nile Virus is a human, horse and bird pathogen that is transmitted through mosquito bites. Since first isolated in 1937, the virus has been known to cause asymptomatic infection and fevers in humans. Less than 1% of infected people develop more serious illness that includes encephalitis and meningitis, which can result in death. In North America, human and animal infections were not documented until the 1999 outbreak in New York City. Since then, the disease has spread to 49 states across the United States and seven provinces in Canada including confirmed cases of human infection in Ontario.⁴⁶

In 2002, cases of locally acquired WNV occurred for the first time in Peel, with a total of 37 confirmed cases and 20 probable cases. Among the 57 confirmed or probable cases, 26% were aged 50 to 59 years, 23% were aged 60 to 69 years and 18% were aged 70 to 79 years, showing that cases were more prevalent among older adults, but not limited to them. Twenty-eight cases of WNV (among confirmed and probable cases) required hospitalization, of which two died.

In 2003, there were ten residents of Peel who had laboratory evidence of WNV infection. Nine of these had confirmed diagnoses of West Nile Fever and one had a diagnosis of West Nile Neurological Manifestations. There were no deaths due to WNV in 2003. While case definitions and laboratory testing methods differed between 2002 and 2003, these results are still much lower than the 57 residents with laboratory evidence of WNV identified in 2002.

In 2004, there were no human cases of WNV reported in the Region of Peel as compared to 14 cases in the Province of Ontario.

More detailed information on WNV is contained in the report entitled "*2004 West Nile Virus in the Region of Peel*".