ACT Government Health

ACT Population Health Bulletin

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Upcoming Events

1-14 December 2012: My Healthy Food and Drink staff survey
www.surveymonkey.com/s/27GNYRK
3 December 2012: Beyond Today – It's Up to You launch, Australian Institute of Aboriginal and Torres Strait Islander Studies
13 December 2012: Presentation - Eggs, Dogs and People, Outbreaks of Gastroenteritis in 2012, Canberra Hospital Auditorium
Early 2013: My Healthy Food and Drink Choices public consultation
26 February 2013: Population Health Division Showcase Presentation, Canberra Hospital Auditorium.
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Introduction

A message from the Chief Health Officer, Dr Paul Kelly

In this second issue of the ACT Population Health Bulletin, the theme is preparation for the summer. For many Canberrans, summer means a welcome relief from cold weather and the prospect of holidays with family and friends and often away from the ACT. For population health practitioners in the ACT, summer also has specific challenges that include preparation for emergency responses (floods, fires and storms), extreme heat, water quality issues, mosquito borne diseases, food-borne illness and travel-related infections and injuries.

It is forecast that the ACT is heading into a warmer and wetter period compared to comparatively cooler conditions in the past two years. This will likely bring an increased risk of grassfire as well as severe storms. Toxic algal blooms in our lakes remain a concern and this has lead to frequent lake closures and a high degree of community concern in recent years. A number of alternatives have been proposed to alleviate the problem, and Population Health have been involved in those discussions. Ultimately it is a choice between utility and cost. Meanwhile, we remain engaged with weighing up the risks and benefits of lake use, in close consultation with the National Capital Authority and the ACT Environmental Protection Authority.

Food safety issues have been a well publicised issue in the ACT in recent years. Population Health continues to take action on food safety especially in the last 18 months, through some legislative and management changes, as well as forging a close working relationship with the food industry. Two articles in this issue of the Bulletin highlight the importance of careful preparation of food, in particular eggs, so as to avoid Salmonella infection.

For those planning travel to international destinations this summer, it is important to be prepared and to take the necessary precautions to protect against infectious diseases. Before travel, consider your need for vaccinations, particularly measles, mumps and rubella vaccine. Whilst airlines are one of the safest forms of transport, there is more to be concerned about than deep vein thrombosis and what to do in the event of a crash! Once arriving at your destination, dogs, monkeys and bats can be a source of rabies and in Australia bats can be the source of the closely related bat lyssa virus. Remember: don't pat that bat (or that monkey if travelling to Bali).

Thanks to the various authors from the Health Protection Service who contributed articles and to Dr Ranil Appuhamy who is the guest editor for this issue.

Dr Paul Kelly
Editor
30 November 2012

Articles

Extreme Heat

Chris Kelly, Manager, Preparedness & Response Section, Population Health Division

The Australian Experience of Extreme Heat Events

Australia regularly experiences extreme heat events and subsequently many Australians suffer from heat-related stress and illness each year. It is reported that extreme heat events have killed more people than any other natural hazard experienced in Australia over the past 200 years.[1]

The incidence of extreme heat events in Australia has been considerable and is projected to increase.[2] While much of the available literature is focused on mortality, it is important to recognise that the morbidity impacts of heat events can also be significant – in terms of their physical and/or psychological impacts and the burden that is placed on health and emergency services resources. It is also worth noting that in Australia, heat events are often accompanied by bushfires. The cumulative impacts on health and emergency services can be severe.

Extreme Heat Events in the ACT

As with the rest of Australia, the climate of the ACT is strongly influenced by a band of high pressure systems located around the globe between latitudes 30-40 degrees south, known as the sub-tropical ridge. There are significant influences on the climate as this ridge moves north and south throughout the year.

During the summer, the sub tropical ridge is located over southern Australia, generally acting as a barrier, deflecting away rain bearing cold fronts, ensuring that ACT summers are traditionally hot and dry.[3] Historically, January is the hottest month with a mean daily maximum temperature of 27.7°C and an average of 10 days above 30°C or more and 2 days above 35°C or more. The highest recorded maximum temperature in the ACT was 42.2°C on 1 February 1968.

Fortunately the geography of the ACT assists in partially mitigating the intensity of extreme heat events. Both the inland location and an average elevation of 580 meters above mean sea level (AMSL) usually facilitates significant overnight cooling in summer. Additionally, Canberra tends to have cooler easterly winds penetrating from the coast during summer evenings which also bring cloud with moistened air .

Overall, these combined geographic and climatic influences tend to reduce the cumulative impacts of extreme heat events when compared to other major southern Australian cities, prone to extreme heat events, such as Melbourne and Adelaide. Accordingly climate data suggests that the population health impact of the largest historic extreme heat events have been less pronounced for the ACT, than for cities in the southern region of Victoria and South Australia.

However, geography and climate alone does not provide the ACT with immunity from the effects of extreme heat events. The ACT remains prone to extreme heat events migrating from central and southern Australia as was most recently experienced during the summer of 2008-9. During this event that impacted much of south-eastern Australia, the ACT experienced four consecutive days with a maximum daytime temperature exceeding 35°C in January and three consecutive days over 35°C in February 2009. Climate models suggest extreme heat events, such as was experienced in 2008-09, will become more frequent.

Increased community resilience to the effects of extreme heat events is desirable from a planning perspective. From a preparedness perspective, it is vital that governments, in-particular the emergency services and the health sector support the community at risk to undertake coordinated measures to prepare and respond to extreme heat events when they occur. In the ACT this is achieved through the *ACT Extreme Heat Management Plan* (a hazard plan of the ACT Emergency Plan).

Sunset over Mt Arawang (765m AMSL) in Canberra's south. Photo—Chris Kelly

Extreme Heat (*continued*)

The ACT Ambulance Service (ACTAS) is the lead agency for the management plan. Initial activation of the arrangements is in response to a Bureau of Meteorology (BoM) forecast of greater than 35°C for three or more consecutive days. Under the plan, the Health Directorate is responsible for providing annual pre-season information and advice to the community, in particular to vulnerable populations, in relation to measures to take in preparation for summer heat.

In October each year, the Population Health Division implements an extreme heat communication plan targeting vulnerable populations. The Chief Health Officer writes to Aged Care Providers, School Principles and Child Care Centres to provide practical advice to mitigate the impacts of heat stress and improve vulnerable population's resilience to extreme heat events.

Healthcare providers also play a pivotal role in ensuring that those in their care are aware of the dangers posed by extreme heat events. Effective risk communication is crucial so that health care consumers (and the broader community) understand the risks associated with extreme heat events and take appropriate measures to mitigate the impacts. Clinicians will be aware that the effects of heat stress on vulnerable populations can be particularly severe and the onset can be rapid. The very young, the elderly and those with disabilities and chronic illness are disproportionally affected by extreme heat events. Additionally, pregnant women, nursing mothers, and those being medicated for mental illness are also vulnerable to heat stress**.**

The early symptoms of heat related stress may include fatigue, muscle pains or spasms, headaches, dizziness, faintness, nausea and vomiting. If an individual becomes unresponsive or disorientated and heat is suspected as the cause, they should receive urgent medical attention.

Summer in the ACT also sees an increase in outdoor activities including concerts, festivals, sporting events, exhibitions, corporate events and social gatherings. Elevated temperatures can cause discomfort or illness at such events. Both participants and event organisers have roles to play in anticipating extreme heat and mitigating the effects of heat-related stress.

Further information on summer safety including fact sheets for heat stress can be found on the Health Directorate website: http://health.act.gov.au/publications/fact-sheets/avoiding-heat-related-stress

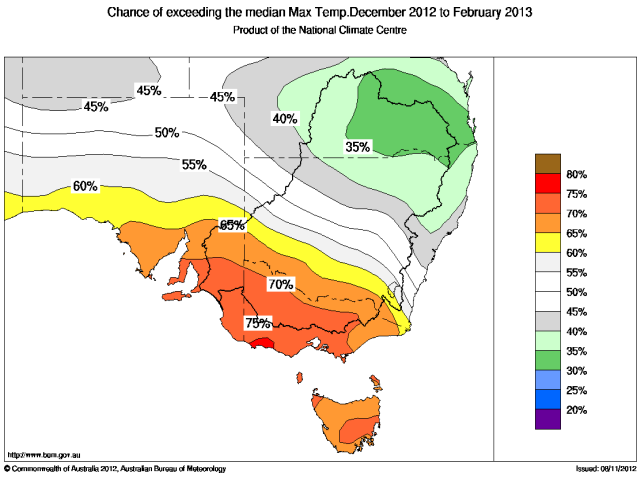

Image from Bureau of Meteorology: available http://www.bom.gov.au/climate/ahead/maps/max.national.hrweb.gif

2012-13 Seasonal Outlook

The BOM advises that the southeast Australian temperature outlook averaged over December 2012 to February 2013 shows that:

- warmer days are more likely over Victoria, Tasmania, and the southern parts of SA and NSW
- cooler days are more likely in northeast NSW.

This outlook is a result of warmer than normal waters persisting in the Indian Ocean, as well as warmer than normal tropical Pacific waters.[4]

The chances that the average summer maximum temperature will exceed the long-term median maximum temperature is between 60 and 75% across Victoria, Tasmania, southern NSW and southern SA, with the strongest odds in southeast SA and southwest Victoria (see map above). Such odds mean that for every ten years with similar oceans patterns to those currently observed, about six or seven summers would be expected to be warmer than average over these areas, while about three or four years would be cooler. The BOM seasonal outlook can be found at http://www.bom.gov.au/climate/ahead/temp.seaus.shtml

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Blue-green Algae

Rebecca Stones, Policy Officer, Environmental Health, Population Health Division

- Some species of blue-green algae contain toxins that may cause illness in humans and animals.
- Blue-green algae exposure generally causes only minor illness; however, depending on the algae species and the level of exposure, serious illness is a possibility.
- The presence of toxic blue-green algae in water cannot be identified by visual inspection – laboratory analysis is needed.

Recreational Water quality in summer

Recreational Water quality has gained a lot of media coverage in the last few years in the ACT. This has largely been due to the repeated need to close recreational water bodies due to high levels of Blue-green algae. These high levels were mostly as a result of many years of low rainfall and hot summer days creating ideal conditions for algal blooms. With summer upon us again, it is important for recreational water users to understand the risks associated with Blue-green algae exposure and how to avoid them.

What are Blue-green Algae?

Blue-green algae (also known as cyanobacteria) are very small organisms that live in water. Certain conditions increase Blue-green algae numbers and promote algal blooms (e.g. long sunny days, still water and high levels of water nutrients).

Some Blue-green algae species (e.g. *Microcystis and Anabaena)* can be toxic to humans and other animals. Unfortunately, it is not possible to identify toxic Blue-green algae by observation alone. Only a laboratory analysis can show whether or not water is affected by a toxic species of Blue-green algae.

What are the Health Risks?

There are three routes of exposure to Blue-green algae toxins:

- direct contact with exposed parts of the body
- accidental ingestion of contaminated water
- accidental inhalation of contaminated water.

Common reactions to blue-green algae exposure and ingestion include gastrointestinal upset, skin irritation, nausea, conjunctivitis, fever, malaise, and flu-like symptoms. It is extremely unlikely that individuals will have a severe or fatal reaction to blue-green algae exposure. There are no recorded incidents of fatal blue-green algae exposure in humans in Australia. However, there have been incidents of severe illness in humans as well as animal deaths. In Brazil in 1996, 50 patients died from hepatic failure after water used in haemodialysis was contaminated with blue-green algae .[1]

Reactions to blue-green algae are unpredictable as some people are more sensitive to algal exposure or may have underlying medical conditions that increase their reaction. The risks associated with blue-green algae also vary depending on the length and type of contact.

How is Blue-green algae monitored in the ACT?

The framework for testing and responding to Blue-green algae in ACT recreational waters is set out in the ACT Guidelines for Recreational Water Quality (the Guidelines are available at: http://www.environment.act.gov.au/__data/assets/pdf_file/0005/175190/FinalACTGuidelinesForRecreationalWaterQuality2010.pdf).

The Guidelines state that the National Capital Authority (NCA) is responsible for Lake Burley Griffin while the Environment Protection Authority (EPA) is responsible for all ACT waterways controlled by the ACT Government (e.g. Lake Ginninderra, Yerrabi Pond, Lake Tuggeranong). In summer, these authorities collect weekly water samples, issue warnings and maintain signage relevant to their recreational waters.

The Health Protection Service (HPS) provides advice to both the NCA and the EPA on the appropriate action to take based on water sampling results. The HPS also provides advice on possible health effects from exposure to the reported algae levels.

Recreational water testing, ACT
Source: Towards a Healthier Australian Capital Territory-A strategic framework for the Population Health Division 2010—2015

Blue-green Algae (*Continued*)

How can I avoid Blue-green algae exposure?

Water users should look for Blue-green algae signage at recreational waters. Permanent signs are in place at Lake Burley Griffin and at various public use areas around Lake Tuggeranong, Lake Ginninderra and the Molonglo River. The signs advise waters users of that area's Blue-green algae and microbial contamination status. The signs will state whether or not the water is open for use and whether or not there is a Blue-green algae warning in place. For instance, a sign may indicate that the water is open for use but warn that moderate amounts of algae are present.

To reduce the risk of exposure to harmful Blue-green algae, recreationists should:

- abide by Blue-green algae warning signs
- not swim in water that appears unclean, smells stagnant or has floating scums
- avoid swallowing recreational water even when no warnings are posted (e.g. do not dive into water)
- avoid submersing your head
- wash thoroughly after contact with recreational water.

Anyone concerned about possible symptoms of Blue-green algae exposure following recreational water use should contact their GP. For more information on Blue-green algae and the latest levels at ACT recreational water sites, please visit: http://www.environment.act.gov.au/water/water_quality/blue-green_algae_monitoring or http://www.nationalcapital.gov.au/WaterQuality/index.php/en/

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Testing of water samples at ACT Government Analytical Laboratory, Population Health Division
Source: Towards a Healthier Australian Capital Territory- A strategic framework for the Population Health Division 2010—2015

Eggs and *Salmonella* infections

Cameron Moffatt, OzFoodNet Epidemiologist, Population Health Division

This article examines links between *Salmonella* infections and egg consumption, using examples from the Australian Capital Territory (ACT) where possible.

It includes a brief background to salmonellosis, provides detail on outbreaks linked to eggs and recommendations for reducing consumer risk, and provides a description of how eggs become contaminated.

Non-typhoidal *Salmonella* is an important cause of foodborne illness in Australia.[1] The incidence of this infection has been increasing in recent years, and although over 12,000 notifications were reported across Australia during 2011,[2] these notifications will only represent a small proportion of the total burden of *Salmonella* infections in Australia. The disease itself generally presents as a self-limiting, febrile gastroenteritis, sometimes as a bacteraemia and occasionally in extra-intestinal forms such as septic arthritis or meningitis.[3] The occurrence of infections in the community generally follows a seasonal pattern, with notifications highest during the warmer summer months with extension into early autumn. In association with the rise in notifications has been an increase in outbreaks of *Salmonella* linked to the consumption of eggs or minimally cooked egg-containing foods.[4] These increases in both infections and egg-associated outbreaks may be observed in the context of increased egg production and consumption, with industry reporting 357 million dozen eggs produced during 2010, with each Australian on average consuming 213 eggs during 2011.[5]

Salmonella outbreaks and eggs

The experiences of the Australian Capital Territory (ACT) largely mirror national disease trends. During 2012, a higher than expected number of *Salmonella* infections have already been reported. From the start of January until the end of April 2012, 125 cases were notified in the ACT, compared with the five year expected mean of 72 cases for the same period.

Three quarters (n=94) of these were identified as belonging to the *Salmonella* serovar *Salmonella enterica* subspecies *enterica* serovar Typhimurium or *S.* Typhimurium. For these *S.* Typhimurium notifications, 40% were linked to outbreaks associated with eggs.

In the ACT, efforts are made to routinely investigate all cases of salmonellosis, assisting with both identifying outbreaks and their cause. In determining whether an outbreak might be attributed to eggs, public health investigators use a variety of complementary methods, including descriptive and analytical epidemiology, the findings from environmental health and food safety investigations and the results from microbiological testing of human, food and environmental samples.

Eggs and *Salmonella* infections (*Continued*)

The results of public health investigations across Australia have shown the most frequently implicated foods linked to egg outbreaks include sauces such as aioli, hollandaise and mayonnaise and desserts such as cheesecake, chocolate mousse, fried ice-cream and tiramisu.[4]

While foodborne disease outbreaks can originate in a variety of settings, outbreaks linked to restaurants and cafes are most readily identified by public health authorities across Australia, including the ACT. [6-8] This is because large numbers of people can be exposed, often in a short period of time. However retail sales still form the largest portion of the egg market[5] and outbreaks in private residences also feature prominently as an exposure setting.[4] Given these facts, egg safety awareness requires a broad focus, with attention to not only high risk foods served in food premises but also by household consumers.

Photo from ACT Health Directorate Communications and Marketing

Reducing the risk to consumers

Risk of illness associated with eggs can be reduced through the manner in which eggs are stored, handled and cooked.[9] Storage of eggs within a refrigerator and within their carton will maximise their shelf life and reduce the opportunity for any bacteria present to multiply. Eggs should also be used before their use by date. When handling eggs, they should not be washed. This is because the shells are porous and there is risk of bacterial transfer, with this being further exacerbated if eggs are cracked.

Hand washing is also important after handling eggs, particularly if the eggs have visible dirt and cracks present. Due to cross contamination risk, kitchen surfaces and utensils that may have in contact with raw egg need to be thoroughly washed and dried. Cooking will readily inactivate any *Salmonella* present on the surface of an egg shell or which may have transferred to the internal contents via pores or cracks. However, illness can occur if raw eggs are added to a food that will not be cooked or will undergo only partial cooking.

Contamination of eggs by Salmonella

Contamination of eggs involves either the shell surface or the internal contents. Shell contamination may occur during the passage of a formed egg through the hen's vagina, cloaca (the chamber where the gastrointestinal and urogenital tracts meet), or via contact with *Salmonella* already present in the egg laying environment, after the egg is laid.[10] Internal contamination may be caused by penetration of *Salmonella* through cracks (horizontal transmission) or by colonisation of the chicken's ovaries and oviducts, thereby allowing *Salmonella* to be incorporated directly into the forming egg (vertical transmission).[10]

Vertical transmission is not currently viewed as a significant concern in Australia as *S.* Enteritidis, the serovar commonly associated with this transmission type, is not endemic in Australian egg laying flocks.[1] The absence of locally acquired egg-associated *S.* Enteritidis infections is supported by surveillance data showing a majority of human infections with this serovar to have been acquired overseas. However, evidence to exclude vertical transmission of *S.* Typhimurium conclusively is lacking, with in vivo studies showing this serovar to have similar abilities to *S.* Enteritidis in regards to intestinal colonisation, systemic infection, survival in the forming and laid egg and penetration of egg shells and membranes.[11]

Conclusion

Control of salmonellosis continues to present as a significant public health challenge in Australia, with investigations increasingly identifying eggs as the cause of illness in a large number of outbreaks, including those in the ACT.

Year	Food vehicle	Setting	No. of cases	Infectious agent
2008	Hollandaise sauce[6]	Cafe / restaurant	22	*S.* Typhimurium PT 44
2009	Tiramisu[8]	Cafe / restaurant	20	*S.* Typhimurium PT 170
	Zucchini bake	Private residence	5	*S.* Typhimurium PT 170
2010	Chocolate mousse	Private residence	5	*S.* Typhimurium PT 170
2011	Raw egg mayonnaise	Cafe / restaurant	41	*S.* Typhimurium PT 170
2012	Raw egg mayonnaise	Cafe / restaurant	10	*S.* Typhimurium PT 170
	Egg breakfast	Cafe / restaurant	7	*S.* Typhimurium PT 135a
	Raw egg white emulsion	Cafe / restaurant	22	*S.* Typhimurium PT 170
	Hollandaise sauce[7]	Cafe / restaurant	20	*S.* Typhimurium PT 135a

Table 1: Egg associated *Salmonella* outbreaks in the Australian Capital Territory, 2008 - September 2012

Eggs and *Salmonella* infections (Continued)

Foods that contain raw or lightly cooked eggs pose the greatest risk and restaurants are the most likely setting for outbreaks to occur. Nevertheless a significant number of 'sporadic' egg-associated cases of disease are likely to occur within the community. Such risk can be mitigated via better recognition of *Salmonella* risk per se, especially understanding the correct ways to store, handle and cook eggs.

In Australia, much of the focus remains on control of external contamination and regulation of the food industry. However given the burden of *S*. Typhimurium infections the potential for vertical transmission requires greater consideration.

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Food Safety

Rebecca Stones, Policy Officer, Environmental Health, Population Health Division

- Unsafe food may appear and taste normal, therefore, preventative food safety measures (e.g. appropriate handling and storage of food) are of the utmost importance.
- Parties and functions on hot summer days are associated with increased food safety risks due to the increased potential for poor food temperature control and increased number of certain vermin (e.g. such as flies).
- Some individuals are more susceptible to foodborne illness and may experience more severe and/or prolonged illness (e.g. the elderly, young children, pregnant women and the immunocompromised).
- Correct food safety is not complicated – regular hand washing, hygienic food preparation and storage areas, and monitoring of food temperatures are simple interventions that can prevent serious illness.

Good food safety is vital, particularly as the weather becomes warmer. Bacteria such as *Salmonella, Listeria monocytogenes* and *Escherichia coli* can multiply rapidly in food especially between the temperatures of 5°C and 60°C. The presence of vermin such as flies and insects may also increase in summer. These vermin can cause dangerous food contamination, particularly if they are vectors for bacteria and viruses.
If proper food temperature, preparation and storage controls are not observed during hot weather, the likelihood of food safety problems increases. Unfortunately, large parties and functions (e.g. summer BBQs, Christmas gatherings) are associated with an increased risk of food poisoning. Food that has not been stored or prepared safely can be especially dangerous for children, pregnant women, the immunocompromised and the elderly.

Tainted food may have an altered taste, odour and/or appearance. However, it may also appear and taste completely normal. Since it is not always possible to tell whether or not food is tainted, it is extremely important to take precautions to ensure the safety of food. Here are some tips to ensure food safety during summer and year-round:

- Always wash your hands thoroughly with soap and warm water before preparing or eating food. Dry hands with a clean cloth or paper towel.
- Be mindful of temperature. Bacteria thrive best between 5°C and 60°C, so ensure cold food is kept cold and hot food is served steaming hot. Monitor your fridge's temperature with a thermometer during hot weather or periods of heavy use (e.g. during Christmas parties).

Food Safety (*Continued*)

- Limit and monitor bench time. Temperature sensitive foods that have been in the range of 5°C and 60°C for up to two hours can be refrigerated again. If foods have been in this temperature range for two-to-four hours, they should be used immediately or discarded. If more than four hours, the foods should not be used or consumed.
- Keep food safe from vermin (e.g. mice, insects). Vermin can transfer harmful bacteria, viruses and dirt to foods. If cooking outside (e.g. at a BBQ) use food netting or containers to protect food from flies and other pests.
- Avoid cross contamination. Make sure raw meat cannot drip onto other foods in the fridge (e.g. fruit and vegetables). Use separate chopping boards and utensils for raw meat, cooked meat and fruit/vegetables.
- Avoid lunchbox foods that would normally be kept in refrigerators, especially during summer months. If lunches are packed with such foods (e.g. ham, yoghurt, fish, rice, etc.), use an insulated lunchbox/bag and pack a cold brick or frozen drink to keep the food cool.

For more information and fact sheets, visit the Health Protection Service's Food Safety Resources page (www.health.act.gov.au/foodsafety).

Diagnosed cases of Salmonellosis, Brucellosis , Listeriosis, Shigellosis, Yersiniosis, Shiga Toxin-producing and Vero Toxin-producing *Escherichia coli* (STEC/VTEC) are notifiable conditions under the *Public Health Act 1997*. Food poisoning and gastro-intestinal illness clusters are also notifiable conditions. Medical practitioners, pathologists, hospital managers, and authorised nurse practitioners must notify these conditions to Public Health Officers within the Communicable Disease Control (CDC) section of the Health Protection Service (HPS). CDC can be contacted by telephone on (02) 6205 2155.

Photo from ACT Health Directorate Communications and Marketing

Spas and Pools

Claire O'Brien, Project Officer and Rebecca Stones, Project Officer, Environmental Health, Population Health Division

Public Health at Swimming Pools

Public pools can become crowded in warm weather. Unfortunately, the volume of users means public pools are more likely to be contaminated with disease-causing organisms than domestic swimming pools. Unless pool water is properly and continuously disinfected, disease-causing organisms will live and grow in the water.

The most common source of pool water contamination is swimmers introducing foreign matter to the water. Contamination can include bodily fluids and solids (e.g. urine, nasal mucus, saliva, sweat, hair, skin and faecal matter), dirt, makeup, lotions and bandaids. Although certain contaminants, (such as make-up and lotions) may not seem like a major issue, they can reduce the effectiveness of disinfectants by binding to them. This means that there is less disinfectant to kill pathogens. The more contaminants are present in the water, the more disinfectant is required. Therefore, it is important that people are clean before entering the pool.

Common pool pathogens include the protozoan parasites *Giardia* and *Cryptosporidium*, both of which can cause severe gastrointestinal illness. These parasites are usually introduced to pool water by infected individuals. Both of these parasites are resistant to common pool disinfectants (i.e. chlorine and bromine). As such, they require additional pool disinfection measures to ensure their control. Pool operators may use various additional pool disinfection methods to control these parasites, such as a one-off significantly high dose of chlorine or micro-filtration (with an 'absolute one micron rated filter'). Given the difficulty of removing these parasites from pool water, it is better to prevent pool water contamination in the first place through education of pool operators and users.

To prevent a swimming and/or spa pool from becoming a source of illness, pool operators must use an appropriate method of disinfection. There are several different methods of disinfection (e.g. chlorination, bromination, ozonation, microfiltration). Given the complexity of proper pool maintenance, pool operators are advised to seek professional advice when selecting and using disinfection agents and systems.

Public pools must have a water contamination management plan that outlines strategies for contamination prevention and appropriate responses to any water contamination. Pool operators and other staff must be aware of the plan so that it can be followed in the event of a contamination.

Spas and Pools (Continued)

To prevent pool water contamination, pool users should be educated to do the following:

- Babies and young children who ordinarily wear a nappy should use an aqua nappy or equivalent in the water.
- Parents/guardians should encourage young children to use the toilet before swimming.
- Anyone who has had a gastrointestinal illness (i.e. vomiting or diarrhoea) should not enter the water for at least 48 hours after symptoms subside.
- Swimmers should shower before entering the water.

There are some simple tips that swimmers can follow to protect themselves, their families, and others from infection when using pools and/or spas.

Swimmers

- Do not swim when you have diarrhoea. The infective agent can spread in the water and make others sick.
- Avoid getting water in your mouth.
- Do not swallow the pool water.
- Shower after using the toilet if you are going back into the pool/spa.
- Practice good personal hygiene. Shower with soap before swimming and wash your hands after using the toilet or changing nappies. This will reduce the likelihood of pathogens on your body contaminating the water.

Parents and young children

- Take children for bathroom breaks and shower them afterwards.
- Ensure nappies are checked regularly.
- Change nappies in a bathroom or nappy-changing area and not at the poolside.
- Make sure you wash your child thoroughly with soap and water before swimming to avoid water contamination.

The ACT Government Health Directorate's Health Protection Service registers, inspects, monitors water quality and investigates complaints regarding public swimming and/or spa pools in the ACT. For information about public health concerns at swimming pools, visit the Health Directorate's website at www.health.act.gov.au. Information on ACT public swimming pool locations and safety requirements for residential pools and spas can be found at the ACT Government swimming pools entry point (http://www.act.gov.au/browse/topics/sport-and-recreation/swimming-pools).

Airline travel and communicable disease

Ranil Appuhamy, Public Health Physician, Population Health Division

- A large number of people travel in commercial airlines
- Air quality in airlines is quite high. However, the closed environment of the airline and proximity of seating can facilitate the spread of diseases.
- The most common diseases that can be spread in-flight include those that can be spread via the airborne route and also food borne illnesses.

There has been a steady increase in people travelling in commercial airlines globally, with over 38 million flights in 2011.[1] In July 2012 alone, there were 690,100 short-term overseas departures from Australia.[2] The greatest concern to global public health concerning air travel is the ability to transfer infectious diseases from one country to the other in a matter of hours.[3] However, the closed environment of airlines and the proximity of passenger seating can facilitate the spread of infectious disease among airline passengers within the flight. The aim of this article is to highlight a few diseases of public health importance that can be transmitted on aeroplanes.

The cabin environment

During flight, fresh air, which is sterile at flying altitude, is supplied to the cabin via intake by the aircraft's engines.[4] A majority of commercial airlines recirculate 50% of the cabin air with filtration by high efficiency particulate air filters (HEPA).[4,5]The air circulation pattern in a typical airline follows a laminar flow pattern. Air enters from above the cabin, passes from side-to-side and exits the cabin near the floor (Figure 1).[6] The airflow is divided into sections thereby limiting the airborne spread of particles within the cabin.[5]

Studies on the transmission risk of diseases in aircraft is limited and is impacted by difficulties of following up passengers, underreporting of disease and the fact that most diseases have incubation periods that are longer than the flight time.[5]

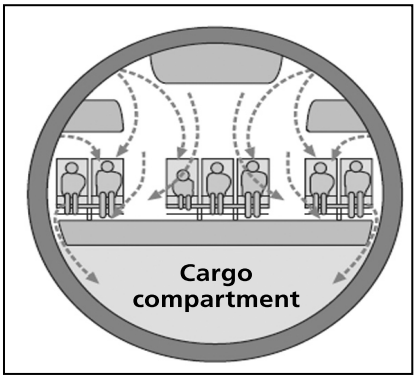

Figure 1: Cabin airflow patterns in an aeroplane. Image from reference 6 with permis-

Airline travel and communicable diseases (*Continued*)

The highest risk for passengers are diseases that are transmitted via the airborne or droplet form. This risk is thought to be highest for passengers sitting within 2 rows of a infectious passenger and for a flight time of greater than 8 hours.[5,6]

Diseases transmitted inflight

A number of factors affect the probability of disease transmission within an aircraft. These include the infectiousness of the case, the susceptibly of those exposed, the duration of exposure, how close a contact is to a case and the efficiency of cabin ventilation.[6]

One of the most readily transmitted infectious diseases that can be spread via the airborne route is measles.[7] Not surprisingly, there have been several reports of in-flight spread of measles.[4,5] For example, in 2010, an outbreak of measles occurred after an infectious case arrived on a 12 hour long flight to Australia with four of the secondary cases being in the same flight as the index case.[8]

Possible disease transmission of Tuberculosis (TB), a bacterial disease caused by *Mycobacterium Tuberculosis* has also been reported.[4,6] However, the risk is thought to be similar or less than in circumstances where people are together in other confined spaces.[6] Although not common, a review of literature relating to in-flight transmission of meningococcal disease had found evidence in one instance, where documented transmission had occurred.[4] Meningococcal disease transmission can occur after direct respiratory contact of those who are infected. The Australian national guidelines for meningococcal disease recommend clearance antibiotics for passengers seated immediately adjacent to an infectious case in a flight greater than 8 hours duration[9].

In-flight transmission of influenza and Severe Acute Respiratory Syndrome (SARS) virus has also been documented.[4] During the 2009 pandemic, there were several reports documenting the potential in-flight spread of pandemic influenza.[10,11] The importance of the aircraft ventilation system in reducing the risk of airborne transmission of influenza was highlighted in a study from the US in 1979.[12]

In addition to airborne spread of diseases caused by an infected passenger, there have been several reports of food-borne outbreaks associated with commercial air-travel.[5,13] A review of air travel associated food borne outbreaks showed that *Salmonella* species were responsible for most of the outbreaks (39.5%), followed by *Staphyloccocus Aureus.*[13] Other organisms include *Vibrio, Shigella* and *Norovirus* species [5,13].

One of the largest reported outbreaks that occurred in Australia in 1991 involved 3053 people and was associated with orange juice contaminated with *Norovirus.*[5,13] In 2009, there was an outbreak of *Listeria monocytogenes* linked to the consumption of chicken wraps in a domestic Australian airline.[14] While a variety of foodstuffs have been implicated in these outbreaks, most of them were due to inadequate temperature control. [13] Fortunately, the incidence of food borne outbreaks has continued to reduce considerably due to improvements in food handling.[5]

Conclusion

This brief article has highlighted a number of diseases that has the potential to be transmitted through air travel. Although concerns have been raised regarding air quality in aircraft, the air quality in modern commercial airlines is high and in general, cabin air quality is cleaner than most office buildings.[6]

Public health units across Australia follow up notifiable communicable diseases according to local and national guidelines.[15] There are guidelines for following up contacts on international flights, which is coordinated nationally by the National Incident Room at the Department of Health and Ageing.

Practical ways of reducing the likelihood of acquiring infectious diseases during travel is to ensure that vaccinations are up to date and simple hygiene measures like hand-washing is carried out. Before travelling it is important to see a doctor to ensure that vaccinations and necessary medications are up-to date. The Australian Government website: smartraveller.gov.au is a useful website that provides up-to date travel information.

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Slip on some sun-protective clothing that covers as much skin as possible.

Slop on SPF30+ broad-spectrum sunscreen. Always use in **combination** with the other sun protection measures

Slap on a hat that protects your face, head, neck and ears.

Slide on some sunglasses. A close fitting, wrap-around style will offer best protection.
Sunglasses should meet AS1067

Seek shade whenever possible

Source: ACT Cancer Council

Articles

Beware of Bats!

Esther Lam, Public Health Nurse, Communicable Disease Control, Population Health Division

- Australian Bat Lyssavirus (ABLV) and rabies have similar clinical symptoms and outcomes
- Without treatment, ABLV and rabies are fatal
- Only appropriately vaccinated and trained people should handle bats
- Contact the ACT Health Communicable Disease Control section on 6205 2155 for advice

Introduction

Australian Bat Lyssavirus (ABLV) and rabies virus are both members of the *Rhabdoviridae* family, *Lyssavirus* genus. In Australia, there have been two documented cases of ABLV infection in humans, one in 1996 and the other in 1998, both occurring in Queensland.[1] The first case was in a bat carer where the disease had an incubation period of four weeks. The second case was a non-occupational exposure and had an incubation period of two years. Both cases developed encephalitis after being bitten by bats and both cases died.[1]

Mode of Transmission

Rabies and ABLV are transmitted via contact with the saliva of an infected animal. This can be from bites, scratches, licks to broken skin or exposure of mucous membranes brain/nervous system tissues. Rabies is endemic throughout most of Africa, Asia (including Bali), the Americas and Europe. Dogs are the main source of human infection but other sources can include cats, monkeys, bats, jackals, raccoons, foxes, coyotes, wolves, skunks and mongooses. The animal population in Australia is free from rabies at this time, however ABLV infection has been documented in flying foxes (fruit bats) and microbats. It is assumed that any Australian bat species could carry and transmit ABLV. There is no concern with ABLV transmission with bat blood, urine or faeces.[2]

Incubation Period

The incubation period for rabies is typically 3-8 weeks, but can range from a few days to several years. The length of incubation is dependent on several factors including severity of the wound, wound location in relation to nerve supply and proximity of the wound to the brain.[2,3] The incubation period for ABLV is unknown but it is assumed to similar to that of rabies.

Symptoms

ABLV and rabies infection have similar clinical symptoms and outcomes. Initial symptoms of rabies include fever and pain and/or paraesthesia at the wound site. Other prodromal symptoms can include headache, malaise, anxiety, anorexia, nausea and vomiting. The prodromal phase usually lasts about 10 days; this is followed by the encephalitic or paralytic rabies. Encephalitic or furious rabies occurs in two thirds of cases and is characterised by aerophobia (fear of air), hydrophobia (fear of water), delirium and hyperactivity. Other symptoms may include hypersalivation, hyperthermia, hyperventilation and convulsions. The paralytic form of rabies presents in one third of cases with paralysis of limbs and respiratory muscles. Death from cardiac or respiratory arrest usually occurs within a few days with furious rabies and within 1-2 weeks with paralytic rabies.[2,3]

Only appropriately vaccinated and trained people should handle bats. Community members should not handle bats and should contact RSPCA Wildlife on 6287 8113 during business hours and 0413 495 031 after hours for assistance with injured bats or if bats have been caught in nets.

If you are scratched or bitten by a bat, immediate wound cleansing will minimise the risk of transmission. As soon as possible after exposure, all wounds should be thoroughly cleansed with soap and copious amounts of water for 5 minutes. A virucidal antiseptic such as povidone-iodine or alcohol should also be applied after washing. The wound should not be sutured unless unavoidable and then should only occur after human rabies immunoglobulin (HRIG) has been administered.

ACT Health Protection Service, Communicable Disease Control (CDC) should be contacted to arrange post exposure prophylaxis (PEP) on 6205 2155 during business hours or via a pager 9962 4155 after hours. CDC will provide advice on the risk of the exposure, recommended PEP and arrange for delivery of PEP to your doctor. PEP treatment may include HRIG and several rabies vaccines given over the course of a few of weeks. In the ACT, the Communicable Disease Control Section has received seven requests for ABLV PEP thus far this year. Six of these reports were due to local exposures and one was from overseas.

There was a large colony of flying foxes living in Commonwealth Park which has since moved on. It is not known whether this colony will return to the ACT.

For more information on ABLV and rabies http://health.act.gov.au/publications-reports/fact-sheets/

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Mumps cluster - ACT August 2012

April Roberts-Witteveen, Epidemiologist, Communicable Disease Control, Population Health Division

Background

Mumps is a virus that can be transmitted from person to person through exposure to the saliva of an infected person through the air by droplets or direct contact. Common symptoms include fever, swelling of glands around the cheeks, jaw line and below the ears. Severe symptoms are uncommon but include respiratory symptoms (40-50%), inflammation of testicles (20-30% in post-pubertal males), meningitis (10%), pancreatitis (4%), and 1 in 10,000 cases may develop encephalitis. Mumps infection in the first 12 weeks of pregnancy is associated with spontaneous abortion. The time between exposure to the virus and onset of symptoms is 12-25 days, and the cases are infectious for up to 7 days prior to onset until 9 days after onset.[1]

A vaccine against mumps has been part of the Australian immunisation schedule since 1983, in combination with the measles vaccine. Since 1998, the measles/mumps/rubella (MMR) vaccine has been funded for children aged 1 and 4 years. In addition to free vaccination for children, MMR vaccination is available free of charge for anyone born during or after 1966 who has not received two doses. It is expected that those born before 1966 have natural immunity to the disease.

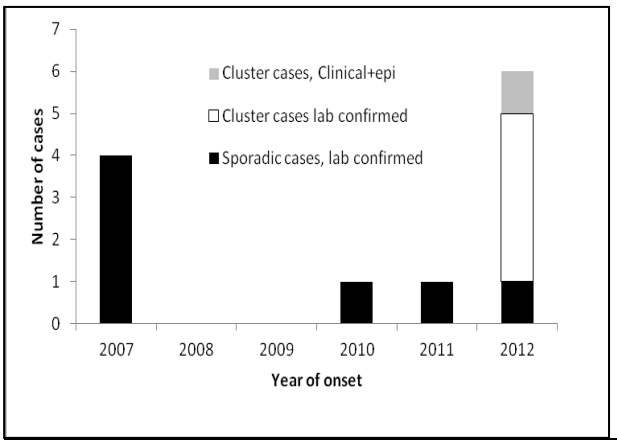
Mumps cases in the ACT

Between 2007 and 2011, there were six sporadic laboratory confirmed cases of mumps notified in the Australian Capital Territory (ACT) (Figure 1). Two cases were aged two. One was fully vaccinated, the other was not vaccinated. The other four cases were aged between 29 and 43 and their vaccination status is unknown. In early 2012 one sporadic case of mumps in a partially vaccinated 31 year old male was notified.

Recent cluster

In mid-2012, a cluster of five mumps cases was identified in a group with repeated social and household contact in the ACT.

Figure 1. Confirmed cases of mumps in the Australian Capital Territory, 2007 – 2012.



- There was a cluster of five mumps cases in July/August 2012 in the ACT.
- Beware of the possibility of mumps and measles infections and outbreaks in Australia and overseas.
- People born after 1966 who have not had an MMR booster are more susceptible to contracting mumps.
- Free MMR vaccine is available for people born during or after 1966 who have not received 2 doses..
- Your GP can provide information about vaccine status

Four cases were laboratory confirmed and further investigation found there was also one epidemiologically linked case with symptoms consistent with mumps. All were aged between 26 and 31. None reported having a second MMR vaccination. The cases' symptoms began between 13 and 17 days after exposure to the previously identified case.

Conclusion

This recent cluster of mumps cases in the ACT demonstrates that some demographic groups remain susceptible to mumps. The same group, and other population groups, are also likely to have poor immunity to measles. An ongoing measles outbreak of over 140 cases in metropolitan Sydney[2] has demonstrated the potential for outbreaks of vaccine preventable conditions in under-immunised population groups in Australia. Exposure to measles whilst travelling overseas to both developed and developing countries is well described[3,4,5], and it is recommended that travellers ask about their medical provider about the possible need for a MMR booster before travelling overseas.

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Notifiable Disease Report

Number of notifications^ of selected notifiable conditions received in the Australian Capital Territory between 1 January and 30 September 2012.

		Number of cases notified^, 2012 (as of 30 September 2012)				Number of cases notified on average, 2007 - 2011	
		Quarter 1	Quarter 2	Quarter 3	YTD*	Quarter 3	Full year
Respiratory Diseases	Influenza	11	133	471	615	*334.4*	*452.8*
Sexually Transmitted Diseases	Chlamydia	351	319	278	948	*266.6*	*1051.8*
	Gonorrhoea	13	22	21	56	*13.6*	*61.0*
Vaccine Preventable Diseases	Pertussis	90	91	67	248	*91.0*	*426.6*
	Mumps	1	0	5	6	*0.4*	*0.8*
Enteric diseases	Campylobacteriosis	158	107	98	363	*89.6*	*463.6*
	Cryptosporidiosis	9	6	2	17	*2.3*	*30.2*
	Giardiasis	33	23	16	72	*19.8*	*101.8*
	Salmonellosis	87	62	20	169	*22.8*	*168.0*

*YTD = Year to date total. For the relevant year, quarter 1 refers to 1 January to 31 March, quarter 2 refers to 1 April to 30 June, quarter 3 refers to 1 July to 30 September, quarter 4 refers to 1 October to 31 December.
^Notifications are reported according to the earliest date recorded which may be onset date, specimen collection date or date of notification.
N.B. Data reported are the number of notifications received by ACT Health. Data are provisional and subject to change.
The number of notifications received for all notifiable diseases for the ACT is available at: http://www9.health.gov.au/cda/source/cda-index.cfm.
HIV data are reported annually by the Kirby Institute: http://www.kirby.unsw.edu.au/surveillance/Annual-Surveillance-Reports

Notes on notifications

Influenza

In 2012, the number of influenza cases notified during winter was greater than for any year in the previous 5 years, apart from 2009. This trend was seen throughout Australia. Seasonal influenza vaccination is recommended annually for any person aged over 6 months who wishes to reduce the chance of becoming unwell because of influenza. Vaccination is free for certain population groups at higher risk of complications arising from influenza infection.
http://www.health.act.gov.au/alerts/influenza-in-the-act/

Mumps

There were 5 epidemiologically linked cases of mumps notified in the third quarter in the ACT. Mumps vaccination is included in the National Immunisation Program, and is available free of charge from general practitioners for those who have not received two doses.

Measles

In New South Wales, over 130 cases of measles have been diagnosed since April 2012. Given this outbreak, it is possible cases may occur in the ACT. Measles vaccination is included in the National Immunisation Program, and is available free of charge from general practitioners for those who have not received two doses.
http://health.act.gov.au/alerts/measles-in-the-act/measles-in-the-act

In the third quarter, there were no notifications of meningococcal disease, measles hepatitis A, or listeriosis in the ACT.

Area Highlight

The Communicable Disease Control Section

The Communicable Disease Control Section (CDC) is part of the Health Protection Service, a branch of the Population Health Division, ACT Government Health Directorate. The primary role of CDC is to minimise the harm caused by the spread of communicable diseases. This is achieved through:

- Surveillance, investigation and public health management of notifiable diseases;
- Management of communicable disease outbreaks;
- Inspection of premises that conduct public health risk activities, such as waxing and tattooing, to ensure compliance with infection control standards;
- Coordinating the implementation of the immunisation program in the ACT and distribution of government funded vaccines to GPs and immunisation clinics;
- Development of Health Directorate policies on communicable diseases and immunisation;
- Enforcement of relevant provisions of public health legislation; and
- Provision of public advice on communicable disease and immunisation issues.

CDC is a multidisciplinary section comprising a number of health disciplines including: epidemiologists, nurses, a public health registrar, public health officers and administrative staff.

Hot Topics

Human Papilloma Virus Vaccine for Boys

Human Papilloma Virus (HPV) is a common virus that affects both males and females. More than 50% of people, both male and female, will be infected with at least one type of genital HPV at some point in time.

Most infected persons do not realize they are infected or that they are passing the virus on to a sexual partner. Vaccination is most effective when given before a person becomes sexually active.

The Australian Government has announced the introduction of a Human Papillomavirus (HPV) vaccine for 12-13 year old boys (year 7).

The boys will be vaccinated through the ACT Government funded school-based program under the National Immunisation Program. The program will commence in 2013 with a two year catch up component for boys in year 9. The vaccine is already funded for girls in year 7.

Extending the program will provide protection to boys and enhance the effectiveness of the vaccination program. The vaccine can provide protection against:

- HPV related cervical cancer;
- HPV related cancers of the vulva, vagina, penis and anus; and
- Genital warts.

HPV vaccine provides protection against the most common HPV types that are known to cause up to 70% of cervical cancers in Australian women. However, even if women have had the vaccine, they still need to have regular Pap tests. This is because the vaccine only protects against some HPV types. There are several other HPV types that can cause cervical cancer that are not protected against by the vaccine.

2012-13 Bushfire Season

The ACT Bushfire season officially commenced on Monday 1 October 2012 and runs until 31 March 2013 unless conditions warrant an extension.

At the commencement of the season, the ACT Emergency Services Agency (ESA) Commissioner, Mr Mark Crosweller, warned "Once again the potential for grass fire risk is high...the past two years have seen above average rainfall which has produced prolific grass growth around the region. Rainfall, temperature and wind will determine how vulnerable the landscape will be to fire this summer."

The ESA recommends that all ACT residents have Bushfire Survival Plan and
PREPARE. ACT. SURVIVE.

The Bushfire Survival Plan can be downloaded from the ACT Emergency Services Agency website at, http://www.esa.act.gov.au.

When bushfire or hazard reduction smoke is present the Health Directorate advises that people with asthma, other chronic respiratory and/or chronic cardiac diseases should not perform vigorous exercise and should stay inside if affected by the smoke.

People with asthma in particular should continue their medication and consult their general practitioner if they have any difficulties.

http://health.act.gov.au/publications-reports/fact-sheets/bushfire-smoke