Foodborne Disease – NSW Epidemiology, Challenges and Strategies

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Number of notifications by quarter from 2011 to Mar 2016 – salmonellosis, giardiasis, cryptosporidiosis, rotavirus
Salmonellosis

- High burden on preschool children, but also young adults
- Hospitalisation 15% (outbreak associated cases)
Salmonella enterica – emerging serovars

Salmonella serovars, quarter 1, 2016 (N=1643)
Salmonellosis - challenges

- Number of notifications

- Time to characterisation leads to delays in cluster identification & difficulties in patient food recall:

<table>
<thead>
<tr>
<th>Step</th>
<th>Time elapsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to onset</td>
<td>1 – 7 days</td>
</tr>
<tr>
<td>Onset to doctor/hospital</td>
<td>?2 days</td>
</tr>
<tr>
<td>Dr to specimen</td>
<td>1 day</td>
</tr>
<tr>
<td>Specimen to primary lab</td>
<td>1 day</td>
</tr>
<tr>
<td>Primary lab isolated salmonella</td>
<td>2 days</td>
</tr>
<tr>
<td>Primary lab send isolate to ICMPR</td>
<td>4 days</td>
</tr>
<tr>
<td>ICMPR serotype</td>
<td>1 day</td>
</tr>
<tr>
<td>ICMPMR send STM to SA</td>
<td>14 days</td>
</tr>
</tbody>
</table>

Time elapsed: 3, 5, 6, 7, 9, 13, 14, 28
Addressing challenges in salmonellosis – Salmonella SMS

Between 24/1/2015-30/4/2015 all salmonellosis cases notified by electronic laboratory reporting (ELR) and aged over 2 years, and that had a mobile number on file were sent an SMS.

Cases reply with information.

Responses were reviewed daily and if the respondent mentioned a commercial premises a second SMS was sent.

Responses monitored for clusters and links to known outbreaks.
Salmonella SMS Results:

1,554 *salmonella* notifications occurred between 24/1/2015-30/4/2015

- 832 (54%) of these were received by electronic lab report
- 495 (59%) of these were over 2 years old and had a mobile number on file
- 475 (96%) of these were sent an SMS. (31% of all cases)

212 SMS responses were received and 6 cases called the PHU number
- 46% response rate
**Salmonella SMS Results:**

132 (62%) reported a commercial food premise and were sent the 2nd SMS

- 29 cases (14%) reported overseas travel
- 19 cases (9%) reported only eating food prepared at home
- Common fast food restaurants at various locations were often reported (34 cases, 16%)
- 8 parents (4%) reported their child’s exposure was at child care

12 cases mentioned a food premises that was already known to us as a possible source of foodborne illness.

Two cases reported the same catered training event.

- This was investigated and the likely cause was thought to be undercooked hamburgers.
## Salmonella SMS Results:

<table>
<thead>
<tr>
<th>Age group</th>
<th>Response rate</th>
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<tbody>
<tr>
<td>2-16</td>
<td>45%</td>
</tr>
<tr>
<td>17 to 25</td>
<td>49%</td>
</tr>
<tr>
<td>26 to 39</td>
<td>49%</td>
</tr>
<tr>
<td>40 to 59</td>
<td>40%</td>
</tr>
<tr>
<td>Over 60</td>
<td>41%</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Day/time sent</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 9am</td>
<td>42%</td>
</tr>
<tr>
<td>Work hours</td>
<td>39%</td>
</tr>
<tr>
<td>After 5pm</td>
<td>46%</td>
</tr>
<tr>
<td>Saturday</td>
<td>49%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>48%</td>
</tr>
<tr>
<td>Female</td>
<td>42%</td>
</tr>
</tbody>
</table>
Addressing challenges in salmonellosis – *Salmonella* tracker
Addressing challenges in salmonellosis – whole genome sequencing

- Potential to by-pass the delay to MLVA for *Salmonella Typhimurium*
- Potential to better define clusters due to other serovars
- Potential to confirm (or exclude) environmental sources
New Strategies in *Salmonella* control

- NSW Food Authority *Salmonella* reduction strategy
- Synthesising human, food & agricultural testing
- CDNA – *Salmonella* & Eggs Working Group
- Exploring national approach in collaboration with Food Regulation Sub-Committee
Cryptosporidiosis & giardiasis

Impact of increased use of more sensitive tests:

Health Protection NSW – giardiasis denominator data – Feb 2012 – June 2016
Number of notifications by quarter and disease from 2011 to March 2016 – shigellosis, hepatitis A, typhoid & paratyphoid
Shigellosis

- Predominantly overseas acquired or MSM
- One recent foodborne outbreak related to infectious food handler
Shigellosis - challenges

- Increased detection with adoption of more sensitive tests
- Priority organism for antimicrobial resistance
- Local outbreaks linked to MSM
Shigellosis - strategies

Denominator Data

Health Protection NSW – shigellosis denominator data – Feb 2012 – June 2016
Shigellosis - challenges

Antimicrobial resistance profiles of 160 *Shigella* isolates from New South Wales during 1 May 2013 to 30 April 2014 – JD Brown & SJ Willcox
SHIGELLA ALERT
Information for NSW Clinicians

Please distribute this information to all.

Key points:
1. There is an outbreak of shigellosis amongst gay men in Sydney
2. Request stool specimens in gay men with diarrhoea
3. Use culture sensitivities to guide antibiotic selection

There is an outbreak of shigellosis among gay men, predominantly in the inner Sydney area but with cases from across NSW. In the first six months of 2016, 154 cases of shigellosis were notified, which is the expected number of notifications for the full year. Of these, 120 notifications were in men, of whom half reported sex with another male during their incubation period.

There is evidence of antibiotic resistance to common antibiotics in Shigella isolates in NSW. Testing of 160 isolates from 2013-14 found 35% resistant to ciprofloxacin, 76% resistant to co-trimoxazole, and 37% resistant to ampicillin. (MJA 2016;204(7)).
Hepatitis A

- 24 locally acquired cases in 2015
- 17 cases linked to frozen imported berry outbreak
Hepatitis A – challenges & new strategies

Challenges

- Effective pre-travel advice
- Minimal population immunity except for vaccinated groups
- Increasingly global food market

New initiatives

- Prospective genotyping of all cases
- FSANZ re-consideration of “high risk foods”
Number of notifications by quarter and disease from 2011 to March 2016 – listeriosis, hepatitis E, STEC & HUS
Listeriosis

Perinatal and non-perinatal reported Listeria, from 01 Jan 2010 to 30 Jun 2016

Listeriosis notifications in NSW residents, by five year age group and sex. 01Aug2015 - 31Jul2016

Last updated on: 25 August 2016
Excludes cases where sex or age is unknown.
Based on onset: the earlier of patient-reported onset date, specimen date or date of notification.
Co-morbidities

Proportion of Listeria patients who reported a co-morbidity, from 01 Jan 2010 to 30 Jun 2016
(NB: excludes data from doctors or chart notes)
- 32.0% of listeria cases were on at least one type of immunosuppressant medication or therapy (radiotherapy, chemotherapy, systemic steroids, cyclosporine or other affecting immune system)
- Other medications include medications for diabetes, blood pressure, cholesterol, anti-inflammatories
Before this illness with Listeria, did a healthcare worker tell you to avoid certain foods to prevent listeriosis?

- **11%** of all listeria notifications received information
  - 55% had a hospital visit or admission in the four weeks prior to infection

- **11%** of all listeria notifications with cancer received information
  - 64% had a hospital visit or admission in the four weeks prior to infection

- **10.3%** of all listeria notifications who were on immunosuppressant medications
  - 44.2% had a hospital visit or admission in the four weeks prior to infection
Listeriosis – new strategies

- Routine WGS to improve cluster detection
- Work with Cancer Institute & Cancer Council to raise awareness amongst clinicians and patients
Hepatitis E

- Recently recognised as a locally acquired infection
- Mainly affecting older men
- Occupational risk for swine workers, vets
Local transmission of hepatitis E virus in Australia: implications for clinicians and public health

Outbreak indicates that HEV should be considered in cases of acute hepatitis, irrespective of the patient’s travel history

In this issue of the MJ, Yapa and her colleagues report an outbreak of locally acquired hepatitis E virus (HEV) in Australia. The authors describe 24 cases of serologically confirmed HEV infection in people who had not travelled overseas during the HEV incubation period. Of these, 17 individuals could be epidemiologically linked to a single restaurant; HEV sequencing studies were consistent with a single source outbreak. Seven other locally acquired infections were also identified that were not linked to this restaurant; in one case, HEV RNA was detected in a pork liver sausage locally produced in Australia. HEV has previously been detected in Australian pigs.

“Undercooked pork and wild boar products have been implicated as sources of zoonotic transmission.”

HEV causes an acute, self-limiting hepatitis, similar to hepatitis A virus (HAV) infection, and can be difficult to distinguish clinically from other causes of acute liver injury. Infection during pregnancy is associated with a particularly high mortality rate. As for HAV, resolution of HEV infection generally confers protective immunity; hepatitis E may cause progressive liver disease. Reducing immunosuppression or treatment with ribavirin or pegylated interferon-α can achieve viral clearance; very recently, sofosbuvir was shown to have antiviral activity against HEV.

The report by Yapa et al indicates the need to consider locally acquired HEV as a cause of acute hepatitis in Australian patients. We suggest HEV serological testing should be requested in cases of acute hepatitis where the initial diagnostic panel is negative, including for people who have not travelled abroad. Reference
HEPATITIS E ALERT
Information for NSW General Practitioners
Please distribute this information to all staff

Key points for GPs:
1. Previously, hepatitis E was only considered a risk for international travellers, but there is now evidence that hepatitis E can be locally acquired.
2. Hepatitis E is an illness that presents similarly to hepatitis A.

Warning about Hep E cases linked with pork liver

Departmental (media releases)
11 September 2014

NSW Health is urging members of the public to thoroughly cook pork products, particularly pork livers, after three recent notifications of Hepatitis E in NSW in people who have not travelled outside Australia.

NSW Health - in collaboration with the NSW Food Authority and the Department of Primary Industries - is investigating the cases which were recorded over the past few days.
STEC & HUS

- Increasing detection of STEC – changed case definition
STEC – challenges & strategies

- Understanding of prevalence in population – asymptomatic carriage
- Understanding clinical and public health significance in person without bloody diarrhoea
- Investigating new surveillance tools
Fish poisoning

<table>
<thead>
<tr>
<th></th>
<th>Scombroid</th>
<th>Ciguatera</th>
</tr>
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<tbody>
<tr>
<td>2011</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2012</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2015</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2016 YTD</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

- Relies on clinician notification
- Emergence of ciguatera in fish caught as far south as mid north coast
Ciguatera advice to fishers on mid north NSW coast

11 April 2016

The NSW Food Authority advises fishers to avoid eating Spanish Mackerel above 10kgs (as advised by NSW industry experts), as there is an increased risk of ciguatera poisoning.

Commercial fishers, recreational fishers and consumers should not eat large Spanish Mackerel, as two recent ciguatera poisoning incidents involving 20kg and 40kg fish that were caught and consumed on the mid north coast have been reported in NSW.

The Food Authority has been advised of an incident of ciguatera poisoning affecting 3 people after consuming a Spanish Mackerel caught off the coast of Crowdy Head late in March, and a second incident last week that affected one person who consumed Spanish Mackerel caught off the coast at Crescent Head. In both cases, the fish consumed were caught by recreational fishermen.

Similar outbreaks were reported 12 months ago on the mid north and far north NSW coast and the Gold Coast in Queensland.
Other Emerging Issues

- Campylobacteriosis
- Antimicrobial resistance surveillance
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