Contents

An outbreak of *Salmonella* Typhimurium phage type 135 at a family Christmas day gathering 66

Tuberculosis epidemiology in Victoria in 2007: continuation of recent trends 69

Reports of bloodstream infections and meningitis to the Victorian Hospital Pathogen Surveillance Scheme, January–June 2008 71

Immunisation update 74

Surveillance report 76
An outbreak of *Salmonella* Typhimurium phage type 135 at a family Christmas Day gathering

Sandra Downing 1,2, Jim Adamopoulos 3, Scott Cameron 1,4, Margaret Hellard 2

1. Master of Applied Epidemiology Program, National Centre for Epidemiology and Population Health, Australian National University, Canberra, Australian Capital Territory
2. Centre for Epidemiology and Population Health Research, Macfarlane Burnet Institute for Medical Research and Public Health, Prahran, Victoria
3. Communicable Disease Prevention and Control Unit, Department of Human Services, Melbourne, Victoria
4. Department of Public Health, University of Adelaide, South Australia

**Background**

On 8 January 2008, the Communicable Disease Prevention and Control Unit (CDPCU) of the Victorian Government Department of Human Services (DHS) received faxed notifications from both a general practitioner (GP) and a regional pathology laboratory of a case of salmonellosis. The notification pertained to a 63 year old female who had gastroenteritis. She, with other family members, had become ill after attending a family gathering on Christmas day. A telephone interview with the woman revealed that her 14 year old granddaughter, who also attended the Christmas function, had been diagnosed with salmonellosis. The mother of the 14 year old was interviewed and reported that three other family members had gastrointestinal symptoms and had provided faecal specimens to a private pathology laboratory.

The Christmas function was held at a private residence with a number of guests providing the food. The main meal was served at lunch and some guests remained for dinner when lunch time leftovers were served.

An investigation was commenced to describe the outbreak, identify the vehicle of transmission and/or source of infection and implement control measures if necessary to prevent the development of further cases.

**Methods**

A retrospective cohort study was commenced with the cohort defined as all individuals who had attended either or both of the Christmas meals. A case was defined as a person who developed diarrhoea and abdominal pain within three days of attending the function. The host provided contact details for guests and a list of foods served at both meals.

There was no leftover food available for microbial testing. A questionnaire was developed to collect data on the onset, duration and nature of symptoms among ill persons and demographic information and a food history from both ill and non-ill persons. Public Health staff conducted telephone interviews with each family group who attended the gathering. Where possible each individual was interviewed, however if a person was not available an immediate family member provided information on their behalf.

Univariate analysis of foods consumed at both lunch and dinner was conducted. All data were entered into the DHS Notifiable Infectious Diseases Surveillance database and analysed using Stata statistical software. Relative risks (RR) with 95 percent confidence intervals (CI) were determined for all foods; p values <0.05 were considered statistically significant. To assess for potential confounding, stratified analysis was conducted for the four foods with an elevated RR.

Five of the seven ill people who sought medical attention already had stool samples collected as part of routine clinical management. No additional faecal specimens were requested from cases.

**Results**

Thirty people attended the Christmas day function and 17 (57 per cent) met the case definition. Four of the 17 had *Salmonella* Typhimurium phage type 135a, a locally designated strain of *Salmonella* Typhimurium phage type 135 (STm135), isolated from a faecal specimen (confirmed case). A further person who had attended the function became ill on 3 January and had STm135a isolated from a faecal specimen. This person, a household contact of three confirmed cases, was considered to be a secondary case and not included in the analysis.

Among the 17 cases, the median age was 29.5 years (range: nine to 68 years) and the male to female ratio was 1:1. Symptoms of the 17 cases included diarrhoea (100 per cent), abdominal pain (100 per cent), fever (72 per cent), nausea (61 per cent), headache (50 per cent) and vomiting (39 per cent). The time of symptom onset for the first case was 3am on December 26th and incubation periods, calculated from the lunch meal

**Figure 1:** Suspected and confirmed cases of *S.*Typhimurium phage type 135a following a Christmas day family gathering, by date of onset, Melbourne, Victoria, 23 December 2007–5 January 2008 (n=18)
Table 1: Exposure, attack rates and risk ratio analysis for food items consumed

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Exposed ill/total (%)</th>
<th>Unexposed ill/total (%)</th>
<th>Relative risk (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ham</td>
<td>15/21 (71)</td>
<td>2/8 (25)</td>
<td>2.9 (0.8, 9.8)</td>
<td>0.02</td>
</tr>
<tr>
<td>turkey</td>
<td>5/13 (38)</td>
<td>10/14 (71)</td>
<td>0.5 (0.3, 1.2)</td>
<td>0.08</td>
</tr>
<tr>
<td>chicken</td>
<td>11/22 (50)</td>
<td>6/6 (83)</td>
<td>0.6 (0.3, 1.0)</td>
<td>0.14</td>
</tr>
<tr>
<td>lamb</td>
<td>11/15 (73)</td>
<td>6/14 (43)</td>
<td>1.7 (0.9, 3.4)</td>
<td>0.09</td>
</tr>
<tr>
<td>pork</td>
<td>11/17 (65)</td>
<td>6/12 (50)</td>
<td>1.3 (0.7, 2.5)</td>
<td>0.43</td>
</tr>
<tr>
<td>carrots</td>
<td>12/14 (86)</td>
<td>5/15 (33)</td>
<td>2.6 (1.2, 5.4)</td>
<td>0.004</td>
</tr>
<tr>
<td>corn</td>
<td>12/14 (86)</td>
<td>5/15 (33)</td>
<td>2.6 (1.2, 5.4)</td>
<td>0.004</td>
</tr>
<tr>
<td>broccoli with cheese</td>
<td>11/17 (65)</td>
<td>6/11 (55)</td>
<td>1.2 (0.6, 2.3)</td>
<td>0.59</td>
</tr>
<tr>
<td>peas</td>
<td>15/19 (79)</td>
<td>2/10 (20)</td>
<td>3.9 (1.1, 13.9)</td>
<td>0.002</td>
</tr>
<tr>
<td>roast pumpkin</td>
<td>11/16 (69)</td>
<td>6/13 (46)</td>
<td>1.5 (0.8, 2.9)</td>
<td>0.18</td>
</tr>
<tr>
<td>roast potato</td>
<td>10/14 (71)</td>
<td>7/15 (47)</td>
<td>1.5 (0.8, 2.9)</td>
<td>0.18</td>
</tr>
<tr>
<td>scalloped potatoes</td>
<td>15/24 (63)</td>
<td>2/5 (40)</td>
<td>1.6 (0.5, 4.8)</td>
<td>0.35</td>
</tr>
<tr>
<td>hard boiled eggs</td>
<td>3/6 (50)</td>
<td>14/23 (61)</td>
<td>0.8 (0.3, 1.9)</td>
<td>0.63</td>
</tr>
<tr>
<td>apple sauce</td>
<td>4/5 (80)</td>
<td>13/24 (54)</td>
<td>1.5 (0.8, 2.6)</td>
<td>0.29</td>
</tr>
<tr>
<td>cranberry sauce</td>
<td>0/1 (0)</td>
<td>17/28 (61)</td>
<td>0 (undefined)</td>
<td>0.23</td>
</tr>
<tr>
<td>gravy</td>
<td>13/19 (68)</td>
<td>4/10 (40)</td>
<td>1.7 (0.7, 3.9)</td>
<td>0.14</td>
</tr>
<tr>
<td>carrot salad</td>
<td>3/5 (60)</td>
<td>14/23 (61)</td>
<td>0.8 (0.3, 1.9)</td>
<td>0.63</td>
</tr>
<tr>
<td>garden salad</td>
<td>2/5 (40)</td>
<td>15/9 (63)</td>
<td>0.6 (0.2, 1.9)</td>
<td>0.35</td>
</tr>
<tr>
<td>roast pumpkin salad</td>
<td>2/3 (67)</td>
<td>4/9 (44)</td>
<td>1.5 (0.5, 4.4)</td>
<td>0.50</td>
</tr>
<tr>
<td>meringue</td>
<td>2/4 (50)</td>
<td>15/25 (60)</td>
<td>0.8 (0.3, 2.3)</td>
<td>0.71</td>
</tr>
<tr>
<td>apricot delight</td>
<td>4/6 (67)</td>
<td>13/23 (56)</td>
<td>1.2 (0.6, 2.3)</td>
<td>0.65</td>
</tr>
<tr>
<td>custard</td>
<td>0/0 (0)</td>
<td>17/29 (58)</td>
<td>undef</td>
<td>undef</td>
</tr>
<tr>
<td>berries</td>
<td>1/1 (100)</td>
<td>16/28 (57)</td>
<td>1.7 (1.3, 2.4)</td>
<td>0.39</td>
</tr>
<tr>
<td>jelly slice</td>
<td>3/4 (75)</td>
<td>14/25 (56)</td>
<td>1.3 (0.7, 2.6)</td>
<td>0.47</td>
</tr>
<tr>
<td>carrot cake</td>
<td>3/4 (75)</td>
<td>14/25 (56)</td>
<td>1.3 (0.7, 2.6)</td>
<td>0.47</td>
</tr>
<tr>
<td>pavlova</td>
<td>4/10 (40)</td>
<td>13/23 (56)</td>
<td>1.2 (0.6, 2.3)</td>
<td>0.65</td>
</tr>
<tr>
<td>plum pudding</td>
<td>2/3 (67)</td>
<td>15/26 (58)</td>
<td>1.2 (0.5, 2.7)</td>
<td>0.76</td>
</tr>
<tr>
<td>baked cheesecake</td>
<td>2/2 (100)</td>
<td>5/13 (38)</td>
<td>2.6 (1.3, 5.1)</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Discussion

The high attack rate (58 per cent) for people eating lunch at the Christmas day function and the distribution of onset times among cases in the epidemic curve suggested a point source outbreak. The investigation failed to identify a single food item as the vehicle of transmission. The epidemiological results indicated multiple food vehicles may have been responsible for the outbreak. Cross-contamination of these foods after cooking from a raw food within the kitchen environment could be one explanation for multiple vehicles of transmission. Alternatively, these four food items with elevated relative risks could simply be confounders for another contaminated food item or ingredient.

Second to Campylobacter, Salmonella is the most common gastroenteritis pathogen reported in Australia, accounting for 8,331 cases in 2006 with S. Typhimurium the most commonly reported serotype and STm 135 the most common phage type. Salmonella accounted for 41 of the 115 (36 per cent) reported foodborne disease outbreaks in 2006 and 25 (61 per cent) were due to S. Typhimurium. In Australia, since 1997, outbreaks of STm 135 infection have been linked to products sold at a bakery, orange juice, pork rolls, chicken and food containing raw eggs. Second to Campylobacter, Salmonella is the most common gastroenteritis pathogen reported in Australia, accounting for 8,331 cases in 2006 with S. Typhimurium the most commonly reported serotype and STm 135 the most common phage type. Salmonella accounted for 41 of the 115 (36 per cent) reported foodborne disease outbreaks in 2006 and 25 (61 per cent) were due to S. Typhimurium. In Australia, since 1997, outbreaks of STm 135 infection have been linked to products sold at a bakery, orange juice, pork rolls, chicken and food containing raw eggs.

Numerous family members brought the food to the residence and assisted with food preparation. The chickens were purchased raw, placed in the residence refrigerator prior to cooking and cooked on a barbecue spit for several hours prior to lunch. These chickens had been purchased from a local supermarket. The ready to eat ham was also purchased from a local supermarket and carved up just prior to lunch. Leftover food from lunch was refrigerated and reheated for dinner.

(midday), ranged between 15 hours to 67.5 hours (median 34 hours) (figure 1). The median duration of illness was 6.8 days (range four to 13). Of the 17 cases, six (35 per cent) consulted a general practitioner regarding their illness. No cases required hospitalisation and all had fully recovered at the time of interview.

Twenty-nine of the 30 attendees ate lunch and 17 (58 per cent) became ill. Of the twenty people who ate dinner, ten became ill (50 per cent). These ten people had also consumed lunch. The attack rate for those that ate both lunch and dinner was 53 per cent.

Univariate analysis of the 28 food items showed few significant associations with illness (table 1). The peas consumed at lunch time had the strongest association with illness, with an RR of 3.9 (95%CI:1.1–13.9, p=0.002). There was also an elevated RR associated with eating: ham 2.9 (95%CI:0.8–9.8, p=0.02); carrots 2.6 (95%CI:1.2–5.4, p=0.004) and corn 2.6 (95%CI:1.2–5.4, p=0.004). Of the 19 people who ate the peas, 15 (79 per cent) became ill. The attack rates among those who consumed ham, carrots and corn were 71, 86 and 86 per cent respectively.

Univariate analysis was conducted by meal and for foods consumed at dinner time, but no associations were statistically significant. Stratification was performed with various combinations of the four implicated food items however the adjusted RRs were not statistically significant.
The analysis revealed elevated crude relative risks and high attack rates for four individual food items: ham, carrots, corn and peas consumed at lunch time. The inability of the stratified analysis to identify one food item as the likely source of infection reflects a combination of a relatively small outbreak and the ubiquity of exposure amongst guests.

It is unlikely that the carrots, corn and peas themselves, cooked immediately prior to serving, would have harboured sufficient bacteria to be the source of the outbreak. The ready to serve cold ham was a possibility, but if it had been contaminated during manufacture it was likely other ham related outbreaks would have been observed over the Christmas period. A more likely scenario was that another ingredient, possibly the raw chicken, contaminated one or some of these food items during food storage or preparation. The chicken was not found to be associated with illness in the analysis, however thorough cooking would have reduced the bacterial load. Contamination of food during preparation from an asymptomatic person infected with STm 135 was another possible cause, but difficult to confirm without a history of gastroenteritis in a food handler.

A number of study limitations should be mentioned. Firstly, alcohol had been consumed during the Christmas day function and the food history interviews were conducted three weeks after the event, both factors introducing potential for recall bias. Secondly, it is possible that those who became ill gave more thought to what they had eaten than those who did not become ill, leading to a different degree of completeness amongst the food histories of cases and non-cases. These types of recall bias could lead to either an overestimation or underestimation of the effect of association between a particular food and illness. Thirdly, guests, and in particular those who had been involved in food preparation, had not been specifically asked about gastrointestinal illness in the days prior to the function, so it was not possible to say whether an infectious food handler was a possible source. Finally, limited details were gathered on food storage, storage facilities and preparation.

During 2006, 13 per cent of all reported Australian foodborne disease outbreaks originated in private residences, second only to outbreaks where food was prepared in restaurants (41 per cent).\(^1\) The scale of unsafe food handling practices in the home was demonstrated by a 1998 study in Melbourne households where 99 per cent of respondents reported some form of unsafe practice when handling food in their home.\(^1\) Annual surveys commissioned by the Food Safety Information Council (FSIC) since 2002, have shown encouraging results in safe food handling awareness, however in 2007, 33 per cent of respondents still believed that rinsing hands in water alone prior to handling food was adequate.\(^4\) This outbreak serves as a reminder of the importance of good food handling practices and of the increased risk for a breach in food safety during the festive season, when household refrigerators are storing much greater volumes of food than usual. Although the specific food item/s responsible for the outbreak remains unknown, our findings suggest a breakdown in safe food handling and preparation may have resulted in cross-contamination between raw meat and other food items served at the function. Despite the efforts of the FSIC in disseminating safe food handling information to consumers, food prepared in private residences continues to be an important source of food-borne outbreaks in Australia. To reduce the burden of food-borne illness in Australia further investment must be made in consumer food safety awareness and behaviour changing education campaigns, including information provided to children in schools as part of the education curriculum.

**Acknowledgements**

The authors wish to acknowledge the assistance provided in this investigation by the Microbiological Diagnostic Unit Public Health Laboratory and the Enteric Unit staff, Communicable Disease Prevention and Control Unit of the Victorian Government Department of Human Services.

The Master of Applied Epidemiology program is funded by the Australian Government Department of Health and Ageing.

**References**


(Peer reviewed)

### Tuberculosis epidemiology in Victoria in 2007: continuation of recent trends

Michelle McPherson and James Fielding, Department of Human Services

One third of the world’s population is currently infected with tuberculosis (TB) with an estimated eight million new cases of TB disease and two million TB deaths occurring every year. Similar to other developed countries, Australia has a low annual estimated incidence of TB with most cases occurring in people born in other countries. The national rate for overseas-born cases in 2006 was more than twenty times that of the non-Indigenous Australian-born national rate.

In Victoria, the epidemiology of TB mirrors that of the national picture. Of the 354 confirmed cases in 2007, 324 (92 per cent) were overseas-born. Cases ranged in age from two to 94 years with a bimodal distribution: higher proportions of cases were in persons aged 20–34 years (44 per cent) and 75–89 years (12 per cent). Fifty-one per cent of cases were in males. Pulmonary-only presentations were reported for 42 per cent of cases; a further 12 per cent were pulmonary plus other sites. Among these latter cases, lymph nodes were the most common extra-pulmonary site (40 per cent) followed by pleural and miliary infections (16 per cent and 14 per cent respectively). Among the 46 per cent of cases for which the presentation was extra pulmonary only, lymph nodes were the most common primary site (61 per cent) followed by the pleura (16 per cent) and bone/joint (10 per cent). Of the overseas-born cases notified in 2007, nearly one third (32 per cent) were from the South Asia region, of which 84 per cent were born in India. A similar proportion (30 per cent) were from Southeast Asia, with 15 per cent from Africa, 10 per cent from North Asia and five per cent from Western Europe (table 1). The median time between arrival in Australia and diagnosis with TB for all overseas-born cases was six years. Cases born in South Asia had the lowest median time between arrival and diagnosis of three years, with almost half having a two year interval between arrival and diagnosis. Cases born in Africa, North and Central Asia had a similar median time between arrival and diagnosis of seven and six years respectively and cases born in Southeast Asia had a median of 12 years. Cases born in Europe, particularly Western Europe, had the longest median periods between arrival in Australia and diagnosis in 2007 (table 1).

The TB diagnosis trends observed in 2007 were largely explained by the country of birth of cases. A recent study analysing the trends of laboratory confirmed TB epidemiology in Victoria between 1990 and 2007 is on the way.
and 2004 reported that overseas-born females were more likely to be diagnosed at a younger age, while Australian-born men were most likely to be diagnosed after the age of 70 years. The proportion of pulmonary disease decreased over the period of the study, which was attributed to the increased proportion of overseas-born cases over time who were more likely to have non-pulmonary disease.

The high proportions of overseas-born cases from India (27 per cent) and Africa (15 per cent) observed in 2007 were consistent with trends described in the study of laboratory confirmed TB cases from 1990 to 2004 in which TB rates by region and country of birth shifted over the study period from Southeast Asia to Africa and, more recently, South Asia (particularly India). This shift reflects Australian migration patterns—with increased migration from Africa—and that Africa is the only continent where TB rates are increasing.

The same patterns in time between arrival in Australia and diagnosis were observed among notified cases of TB in 2007 compared to those in the Victorian 1990–2004 cohort. That is, there was generally longer time between arrival and diagnosis for cases born in Europe and shorter times for those born in Asia and Africa. Among those in the earlier cohort, cases diagnosed more than ten years after arrival were also more likely to be older, similar to that of Australian-born cases of TB. This was attributed to these older generations being born at a time when the risk of TB infection was relatively high, and their long cumulative probability of acquiring infection. In contrast, cases from Asia and Africa were more likely to be diagnosed sooner after arrival in Australia and were younger. This was also observed for cases from Central or Eastern Europe, and reflects the current higher incidence of TB in their countries of origin.

The observation in 2007 that European migrants were being diagnosed with TB more than a decade after their arrival in Australia—an association found to be statistically significant in the 1990–2004 cohort—has implications for the future control of TB in Australia. In the future, the timing of TB diagnoses among migrants from Africa and Asia (where incidence is presently high) that have been in Australia for longer periods may mirror that currently observed for European migrants. As a consequence, the number of TB cases diagnosed in this group would increase. Ongoing migration to Australia from these countries also raises the question as to whether TB can be eliminated from a low incidence country such as Australia.

Acknowledgements

We gratefully acknowledge the TB Control Program staff who conducted the case investigations on which the data in this report are based.

References

Reports of bloodstream infections and meningitis to the Victorian Hospital Pathogen Surveillance Scheme, January–June 2008

Tas Stylianopoulos, Marion Easton, and Mark Veitch, Microbiological Diagnostic Unit – Public Health Laboratory, The University of Melbourne.

We present a summary of reports of bloodstream infections and meningitis to the Victorian Hospital Pathogen Surveillance Scheme (VHPSS) for the first half of 2008. The VHPSS provides voluntary, laboratory-based surveillance of bacterial and fungal agents of bloodstream infections and meningitis in Victoria. Although not all laboratories participate in the VHPSS, the data are broadly representative and readily interpretable to provide insights into the wider population.

Surveillance case definitions

Data presented in this report were based on a case definition in which an episode of bacteraemia or meningitis is defined as the first isolation of a clinically significant bacterium or fungus from the blood or cerebrospinal fluid (CSF) of a person in a 14–day period. Cases with more than one species of bacteria/fungi isolated were counted as separate episodes. Recent historical counts are included for comparison. Data before mid-2003 were based on a slightly different case definition and so serve only as a general guide to trends. An organism may sometimes be identified and reported by the diagnostic laboratory only to the level of genus or may be incompletely speciated (where definitive identification is unnecessary for patient care). Therefore some organism categories, such as coagulase-negative Staphylococcus and Staphylococcus epidermidis, overlap. Variable reporting of suspected contaminants may also affect counts.

Summary of the important agents of bloodstream infection and meningitis, January–June 2008

Cases reported to the VHPSS during this six-month period were diagnosed by 20 laboratories and were associated with 100 Victorian hospitals. There were 2950 reports (2922 bloodstream isolates, 28 from CSF) of 208 species/types of bacteria and fungi. The increase in reports in this period was substantially attributable to increased reports of common pathogens from several major laboratories. This probably reflects improved efficiency and completeness of reporting arising from amalgamation of some laboratory services, and more automated reporting to VHPSS.

The twenty most common organisms accounted for 81 per cent of reports (table 1).

E. coli and S. aureus comprised 41 per cent of the reports from January to June 2008. The predominance of these isolates and the ranking of the most common isolate types remain relatively stable.

The 126 reports of S. pneumoniae isolates in this period was slightly greater than the 113 reports in the first half of

Table 1: Twenty most common isolates reported to VHPSS, January–June 2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>739</td>
<td>647</td>
<td>559</td>
<td>1253</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>470</td>
<td>455</td>
<td>466</td>
<td>841</td>
</tr>
<tr>
<td>Coagulase negative Staphylococcus</td>
<td>169</td>
<td>202</td>
<td>156</td>
<td>384</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>143</td>
<td>107</td>
<td>122</td>
<td>241</td>
</tr>
<tr>
<td>Streptococcus pneumoniae</td>
<td>126</td>
<td>168</td>
<td>148</td>
<td>281</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>103</td>
<td>87</td>
<td>77</td>
<td>178</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>88</td>
<td>73</td>
<td>80</td>
<td>156</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>77</td>
<td>71</td>
<td>64</td>
<td>121</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>66</td>
<td>46</td>
<td>53</td>
<td>113</td>
</tr>
<tr>
<td>Enterococcus faecium</td>
<td>64</td>
<td>55</td>
<td>27</td>
<td>92</td>
</tr>
<tr>
<td>Group A Streptococcus</td>
<td>55</td>
<td>68</td>
<td>36</td>
<td>101</td>
</tr>
<tr>
<td>Group B Streptococcus</td>
<td>54</td>
<td>49</td>
<td>31</td>
<td>84</td>
</tr>
<tr>
<td>Klebsiella oxytoca</td>
<td>52</td>
<td>57</td>
<td>37</td>
<td>96</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>42</td>
<td>45</td>
<td>36</td>
<td>85</td>
</tr>
<tr>
<td>Group G Streptococcus</td>
<td>34</td>
<td>27</td>
<td>25</td>
<td>52</td>
</tr>
<tr>
<td>Streptococcus mitis</td>
<td>29</td>
<td>34</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>Candida albicans</td>
<td>24</td>
<td>29</td>
<td>32</td>
<td>70</td>
</tr>
<tr>
<td>Serratia marcescens</td>
<td>23</td>
<td>20</td>
<td>29</td>
<td>43</td>
</tr>
<tr>
<td>Bacteroides fragilis</td>
<td>22</td>
<td>20</td>
<td>14</td>
<td>36</td>
</tr>
<tr>
<td>Salmonella Typhimurium</td>
<td>21</td>
<td>9</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Total of top 20 for Jan–June 2008</td>
<td>2401</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total of other isolate types</td>
<td>549</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total of all isolates</td>
<td>2950</td>
<td>2781</td>
<td>2525</td>
<td>5391</td>
</tr>
<tr>
<td>Number of isolate types</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2007. Twenty invasive isolates of *S. pneumoniae* in the first half of 2008 were reported from children aged less than five years. Only one of these was due to a serotype (18C) included in the 7-valent pneumococcal conjugate vaccine (7vPCV) that has been provided to Victorian infants since 2005. The remaining isolates from this age group comprised 15 isolates of serotypes included in the 23-valent pneumococcal polysaccharide vaccine (23vPPV, not routinely used for infants), most commonly serotype 19A (seven isolates); and four non-vaccine serotypes. Fifty-three isolates of *S. pneumoniae* in the first half of 2008 were from adults aged greater than 64 years. Thirty-six (71 per cent) of 51 serotyped isolates were serotypes included in the 23vPPV (including six serotype 19A isolates) for which this age group is eligible. The ongoing prominence of serotype 19A as a cause of invasive pneumococcal disease (IPD) in all age groups reflects a change in the local epidemiology of IPD that has been apparent since 2006.¹

Victoria has recently experienced widespread increases in human infection, mostly gastroenteritis, with several phage types of *Salmonella* Typhimurium, particularly phage types 135 and 44. The uncommonly high recent numbers of reports to VHPSS of *S. pneumoniae* Typhimurium infections for this period. Fifteen isolates of *H. influenzae* were reported to VHPSS in the first half of 2008; all were submitted to the Microbiological Diagnostic Unit (MDU) for typing and results from 14 were available. As in recent years, nine non-typable isolates predominated. However, most unusually, there were four type b isolates, all in persons aged between 30 and 44 years. For the past 10 years VHPSS has received, on average, less than one report of invasive *H. influenzae* type b infection per year among persons aged 15 to 59 years. There were no obvious epidemiological connections between the four recent cases.

Eleven isolates of *N. meningitidis* from 15 cases of invasive meningococcal disease were reported to VHPSS in the first half of 2008. These comprised nine reports of *N. meningitidis* Group B (six were infants or young children), one Group Y and one non-typable isolate.

Twenty-eight isolates from CSF were reported to VHPSS of *Salmonella* Typhimurium represent the invasive infections that comprise approximately three per cent of all diagnosed *Salmonella* Typhimurium infections for this period.

**Table 2: Prevalence of key antimicrobial resistances in *S. aureus*, *S. pneumoniae* and Enterococci, January–June 2008**

<table>
<thead>
<tr>
<th>Period</th>
<th>Staphylococcus aureus</th>
<th>Streptococcus pneumonia</th>
<th>Enterococcus faecalis</th>
<th>Enterococcus faecium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Methicillin resistant (%)</td>
<td>Isolates tested (n)</td>
<td>Penicillin non-susceptible (%)</td>
<td>Isolates tested (n)</td>
</tr>
<tr>
<td>Jan–Jun 2008</td>
<td>21</td>
<td>470</td>
<td>7</td>
<td>126</td>
</tr>
<tr>
<td>Mean Jan–Jun (2003–2007)</td>
<td>27</td>
<td>464</td>
<td>8</td>
<td>146</td>
</tr>
</tbody>
</table>

During the period January to June 2008, as for the last several years, a relatively lower proportion of isolates of *S. aureus* isolates were methicillin-resistant (MRSA). The prevalence of methicillin resistance amongst *S. aureus* isolates varied with the duration of hospitalisation before the diagnostic specimen, from 17 per cent among specimens collected before the seventh day of hospitalisation, rising to 44 per cent among specimens collected after the seventh day.

Twenty-two (23 per cent) reports of MRSA included data on six key antimicrobial agents (ciprofloxacin, erythromycin, fusidic acid, gentamicin, rifampicin and tetracycline). Eight (36 per cent) of these isolates were non-multiresistant MRSA (nmMRSA –resistant to methicillin and agents from no more than two other antimicrobial agents). Three of eight nmMRSA isolates were from specimens collected less than three days into hospitalisation and therefore suggestive of community-acquired MRSA bacteraemia. There were no reports of *S. aureus* isolates with reduced susceptibility to vancomycin during this period.

Seven per cent of *S. pneumoniae* isolates were reported to be penicillin non-susceptible (PNSP). All nine of these PNSP...
were reported to demonstrate intermediate susceptibility to penicillin; none were reported to be penicillin-resistant. Eight of the nine PNSP were serotype 19A, comprising two children aged less than five years, and six middle-aged or older adults, only one of whom was in the 23vPPV age-group. These eight serotype 19A PNSP represent an ongoing increase in the number and proportion of non-susceptible serotype 19A *S. pneumoniae* isolates in Victoria since 2005. Most *S. pneumoniae* reports (94 per cent) included susceptibilities for either cefotaxime or ceftriaxone, all were reported to be sensitive. Erythromycin susceptibilities were included in 56 per cent of *S. pneumoniae* reports, with five (seven per cent) reporting resistance.

Invasive infections due to *E. faecalis* were more common than those due to *E. faecium*, but *E. faecium* was more commonly vancomycin resistant. Reports of vancomycin-resistant *E. faecium* have increased since 2006. The vanB gene was detected by PCR in the one vancomycin-resistant *E. faecalis* isolate for which this result was available. Of the 18 vancomycin-resistant *E. faecium* isolates, the vanB gene was detected in 16 and the vanA gene in the other two.

Reports of the susceptibility of *E. coli* to amoxicillin, ceftazidime, gentamicin and ciprofloxacin were available for 100 per cent, 65 per cent, 99 per cent and 94 per cent of isolates respectively. Among *E. coli* isolates with susceptibility data, 47 per cent were resistant to amoxicillin, four per cent to ceftazidime, five per cent to ciprofloxacin and six per cent to gentamicin. Multiple resistances (expressed as the proportion of isolates with adequate susceptibility data) were reported as follows: 33 isolates (five per cent) were resistant to at least both amoxicillin and gentamicin, 18 isolates (three per cent) were resistant to at least amoxicillin, gentamicin and ciprofloxacin, and eight isolates (two per cent) were resistant to amoxicillin, ceftazidime, gentamicin and ciprofloxacin. Of these eight multi-resistant *E. coli*, five were extended spectrum beta-lactamases (ESBL) positive and for three no ESBL result was reported.

**Acknowledgements**

We gratefully acknowledge the confidential contributions of Victorian laboratories to VHPSS, the support provided by the Department of Human Services, and data management by Artemisia Green, Wendy Siryj and Jocelyn Hibberd. Data include reports received by 28 July 2008, and are subject to revision.

**Reference**

Immunisation update
Helen Pitcher, Department of Human Services

Immunisation coverage
Data cited in this report are based on the Australian Childhood Immunisation Register (ACIR) coverage report. Table 1 presents immunisation coverage at 31 March 2008 for children aged 12–<15 months (age cohort one), 24–<27 months (age cohort two) and 60–<63 months (age cohort three) calculated at 30 June 2008. Only vaccines administered before 12 months of age were included in the coverage calculation for the first age group, and only those vaccines administered before 24 and 63 months of age were included in the coverage calculation for the second and third age groups. For a copy of the ACIR report listing immunisation coverage against individual vaccines for each local government area, contact Catherine McNamara at the Department of Human Services (email: immunisation@dhs.vic.gov.au).

ACIR does not provide a quarterly immunisation report on vaccine coverage for rotavirus, pneumococcal disease, meningococcal C disease and varicella. The National Centre for Immunisation Research and Surveillance (NCIRS) provided a coverage report for these vaccines as at 31 March 2008 in the following table.

Seventy-eight per cent of local government authorities (LGAs) achieved immunisation coverage greater than or equal to 90 per cent in cohort one. Victoria reached 91.82 per cent full coverage in cohort one compared to the Australian coverage of 91.21 per cent.

Eighty-eight per cent of LGAs achieved full immunisation coverage greater than or equal to 90 per cent in cohort two. State coverage for cohort two was 93.64 per cent compared to the Australian coverage of 92.79 per cent. Sixty per cent of LGAs achieved full immunisation coverage greater than or equal to 90 per cent for cohort three. State coverage for cohort three was 90.45 per cent compared to the Australian coverage of 87.33 per cent.

Victoria is second only to the ACT in the highest coverage rate for cohort one in Australia and in cohort two is ranked third nationally behind the ACT and Tasmania. The cohort three coverage rate of greater than 90 per cent in Victoria continues to consistently remain the highest nationally and for this quarter.

<table>
<thead>
<tr>
<th>Vaccine antigen</th>
<th>Victoria % coverage</th>
<th>Australia % coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotavirus— at 4 months of age – 1 dose</td>
<td>83.7</td>
<td>83.8</td>
</tr>
<tr>
<td>Cohort born 1–30 November 2007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal – at 12 months of age – 3 doses.</td>
<td>91.7</td>
<td>90.9</td>
</tr>
<tr>
<td>Cohort born Oct–Dec 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal C – at 24 months of age – 1 dose.</td>
<td>94.5</td>
<td>93.7</td>
</tr>
<tr>
<td>Cohort born Oct–Dec 2005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella – 1 dose at 24 months of age</td>
<td>78.4</td>
<td>78.4</td>
</tr>
<tr>
<td>Cohort born Oct–Dec 2005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 1: Childhood immunisation coverage by local government area, Victoria, 31 March 2008

<table>
<thead>
<tr>
<th>Age group</th>
<th>% fully immunised</th>
<th>LOCAL GOVERNMENT AREA (LGA)</th>
<th>Total LGAs (% LGAs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&lt;15 months</td>
<td>100</td>
<td>Ararat, Hindmarsh, Moyne, Queenscliffe, Towong, West Wimmera,</td>
<td>6 (8)</td>
</tr>
<tr>
<td>95+</td>
<td></td>
<td>Central Goldfields, Colac-Otway, Indigo, Mildura, Murrindindi, South Gippsland, Southern Grampians, Warrnambool,</td>
<td>8 (10)</td>
</tr>
<tr>
<td>85&lt;90</td>
<td>Baw Baw, Bayside, Buloke, Delatite, Frankston, Horsham, Loddon, Macedon Ranges Melbourne, Melton, Nillumbik, Northern Grampians, Surf Coast, Wangaratta,</td>
<td>14 (18)</td>
<td></td>
</tr>
<tr>
<td>80&lt;85</td>
<td>Bass Coast, Mount Alexander</td>
<td>2 (3)</td>
<td></td>
</tr>
<tr>
<td>75&lt;80</td>
<td>Hepburn, Gannawarra, Hindmarsh, Horsham, Queenscliffe, Towong, West Wimmera</td>
<td>1 (1)</td>
<td></td>
</tr>
<tr>
<td>24&lt;27 months</td>
<td>100</td>
<td>Campaspe, Colac-Otway, Corangamite, Golden Plains, Greater Bendigo, Greater Geelong, Latrobe, Melton, Moira, Northern Grampians, Southern Grampians, Strathbogie, Surf Coast, Swan Hill, Warrnambool, Wellington, Whittlesea, Wodonga</td>
<td>18 (23)</td>
</tr>
<tr>
<td>85&lt;90</td>
<td>Hepburn, Hobsons Bay, Indigo, Loddon, Macedon Ranges, Manningham, Melbourne Port Phillip, Yarriambiack, Wellington,</td>
<td>9 (12)</td>
<td></td>
</tr>
<tr>
<td>60&lt;63 months</td>
<td>100</td>
<td>Gannawarra, Horsham,</td>
<td>2 (3)</td>
</tr>
<tr>
<td>95+</td>
<td>Alpine, Baw Baw, Campaspe, Golden Plains, Loddon, Southern Grampians, Strathbogie, Warrnambool, Wellington,</td>
<td>9 (12)</td>
<td></td>
</tr>
<tr>
<td>85&lt;90</td>
<td>Bayside, Colac-Otway, East Gippsland, Frankston, Greater Bendigo, Greater Shepparton, Hindmarsh, Hobsons Bay, Manningham, Maribyrnong, Maroondah, Mildura, Monash, Moorabool, Mornington Peninsula, Murrindindi, Nillumbik, Stonnington, Surf Coast, Swan Hill, West Wimmera, Yarra, Yarra Ranges</td>
<td>23 (29)</td>
<td></td>
</tr>
<tr>
<td>80&lt;85</td>
<td>Hepburn, Macedon Ranges, Port Phillip, Queenscliffe, Towong,</td>
<td>5 (6)</td>
<td></td>
</tr>
<tr>
<td>75&lt;80</td>
<td>Ararat, Melbourne, Mount Alexander, Yarriambiack</td>
<td>4 (5)</td>
<td></td>
</tr>
</tbody>
</table>
Surveillance report

The Department of Human Services receives notifications of infectious diseases from medical practitioners and laboratories. These notifications prompt investigation and action to control infectious diseases in Victoria. For some diseases, investigation is initiated based on clinical suspicion in the absence of laboratory confirmation. Prompt notification of infectious diseases is an integral component of prompt public health action. Please do not delay. To notify, call 1300 651 160 or fax 1300 651 170.

This section includes a summary of infectious disease notifications received until 30 June 2008. The Communicable Disease Prevention and Control Unit, Department of Human Services, produced the report in cooperation with the Victorian Infectious Diseases Reference Laboratory and the Macfarlane Burnet Institute for Medical Research and Public Health. We gratefully acknowledge the contribution of the Microbiological Diagnostic Unit of the University of Melbourne and the Melbourne Sexual Health Centre.

Table 12 includes historical comparisons of selected diseases for the period 1 January–30 June 2008 at both the State and regional levels. Summary data at local government level for the diseases listed are available from the Communicable Disease Prevention and Control Unit (telephone 1300 651 160) or on the website at http://www.health.vic.gov.au/ideas/. There were no notifications of Murray Valley encephalitis, diphtheria, Japanese encephalitis, Kunjin virus, plague, rabies, tetanus, poliomyelitis, viral haemorrhagic fevers or yellow fever in this reporting period.

For comments or queries related to data on sexually transmissible diseases, contact the Communicable Disease Prevention and Control Unit. For HIV/AIDS enquiries, contact Carol El-Hayek, Epidemiology and Social Research Unit, Macfarlane Burnet Institute for Medical Research and Public Health (telephone 61 3 9282 2290).

Fortnightly surveillance data from the Victorian Infectious Diseases Reference Laboratory are available at www.vidrl.org.au. All data in this report are provisional and subject to revision as further information becomes available. You can find general information related to the control of infectious diseases (The Blue Book) on line at http://www.health.vic.gov.au/ideas.

Enteric diseases

Joy Gregory, Department of Human Services and OzFoodNet Victoria.

Outbreaks of gastrointestinal illness

There were 113 outbreaks of gastrointestinal illness reported to the Department’s Communicable Disease Prevention and Control Unit (CDPCU) in the second quarter of 2008 (table 1). Of these, eight outbreaks were considered to be foodborne or probable foodborne. Of the remaining 105 outbreaks, person to person transmission was suspected in 86 outbreaks. Ingestion of contaminated swimming pool water was suspected for a proportion of cases in the cryptosporidiosis outbreak. The mode of transmission was unknown for the remaining 18 outbreaks.

Foodborne disease outbreaks

Eight outbreaks were considered to be foodborne or probable foodborne this quarter, affecting at least 111 people and hospitalising 10 people. These outbreaks are summarised below:

In April, CDCPU detected an outbreak during a cluster investigation of cases with STm 44. In total, four confirmed cases of STm 44 from two separate groups of people who dined at the same restaurant on the same night, were diagnosed with STm 44. Interviews were conducted with cases and information regarding foods consumed by all members of the groups was collected. The source of illness was suspected to be a dessert (either chocolate mousse, ice cream or chocolate pudding) that was not cooked through properly. All these desserts contained eggs. Because several weeks had lapsed between the cases eating at the restaurant and CDCPU recognising the outbreak, a decision was made that a meaningful cohort study of restaurant patrons could not be conducted due to recall bias.

In May, CDCPU was notified of two people who had complained to Council that a meal of take-away roast pork and blood soup and stew they had consumed had caused them to become ill with vomiting, diarrhoea and stomach cramps seven hours later. Council sent left over pork and faecal samples for the two cases to MDU for analysis. Both faecal specimens and the leftover pork were positive for Salmonella Johannesburg. A further six cases of S. Johannesburg were subsequently notified and all had consumed roast pork purchased from the premises on the same weekend as the first two cases. An additional two cases were notified two weeks later and investigation revealed that these cases had purchased and consumed roast pork from the premises three weeks after the initial cases. Faecal specimens from two food handlers were also positive for S. Johannesburg, one of whom was asymptomatic. The onset of symptoms for the symptomatic food handler was after symptom onset for the first cases. Another two cases, who did not have faecal specimens collected, were also
linked to the outbreak, making a total of 14 cases. Raw pork was sampled from the supplier of pork to the premises and this was also positive for \textit{S. Johannesburg}, providing evidence that the source of \textit{S. Johannesburg} into the premises was the pork. Based on information provided by the proprietor, it is suspected that the pork was undercooked although this could not be confirmed.

In May an outbreak associated with a commercially catered function was notified to CDCPU. Foods served at the function included a selection of curries and various other types of Sri Lankan foods. There were approximately 240 attendees at the function and a randomly selected cohort of 46 was interviewed. Based on the incubation period (median 14 hours), the symptoms (diarrhoea 100 per cent and abdominal pain 62 per cent) and the duration (median 12 hours) the suspected aetiology was \textit{Clostridium perfringens}. Four faecal specimens were collected over a week after symptoms resolved so it was not unexpected to find that no bacterial or viral pathogens were detected. Analysis of foods consumed by attendees resulted in a statistically significant association with consumption of chicken curry and illness (RR 4.6, 95\%CI 1.23–17.21; \(p=0.004\)). Temperature abuse of food was suspected but could not be confirmed.

An outbreak of gastrointestinal illness in two separate groups of people who attended a café for Mother’s Day breakfast was notified to CDCPU in May. The first group reported eight people ill from a group of nine and the second reported six ill from a group of seven. Interviews were conducted with 11 patrons and faecal specimens were collected from eight. Norovirus was detected in six of these specimens. Interviews were conducted with six out of nine food handlers and no illness was reported, however it is suspected that the outbreak was foodborne due to two separate groups being affected and the incubation periods (median 31 hours) being consistent with a point source.

CDCPU was notified of a case of Hepatitis A in April. The interview revealed that the case was a part-owner of a café who reported that he had not worked at the café during his infectious period. In late May a further case was notified and interviewed. No risk factors were identified but the case mentioned eating at this café during their incubation period. In total there were 10 cases of Hepatitis A notified to CDCPU between 20 May and 6 June who had eaten foods such as sandwiches and salads from this café during their incubation period. In addition there was one confirmed case.

### Table 1: Outbreaks of gastrointestinal illness, 1 April 2008–30 June 2008

<table>
<thead>
<tr>
<th>Setting</th>
<th>Outbreaks</th>
<th>Persons affected</th>
<th>Pathogen/toxin (number of outbreaks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged care</td>
<td>62</td>
<td>834</td>
<td>Norovirus (25) Suspected viral (27) Unknown (10)</td>
</tr>
<tr>
<td>Camp</td>
<td>3</td>
<td>73</td>
<td>Norovirus (3)</td>
</tr>
<tr>
<td>Child care/play centre</td>
<td>13</td>
<td>148</td>
<td>Suspected viral (9) Rotavirus (2) Unknown (2)</td>
</tr>
<tr>
<td>Commercially catered function</td>
<td>2</td>
<td>24</td>
<td>Unknown (2)</td>
</tr>
<tr>
<td>Community</td>
<td>2</td>
<td>9</td>
<td>\textit{Listeria monocytogenes} (1) \textit{Cryptosporidium} (1)</td>
</tr>
<tr>
<td>Hospital</td>
<td>4</td>
<td>38</td>
<td>Norovirus (2) Suspected viral (2)</td>
</tr>
<tr>
<td>*Residential facility (other)</td>
<td>13</td>
<td>67</td>
<td>Norovirus (3) \textit{Campylobacter} (1) Suspected viral (7) Unknown (2)</td>
</tr>
<tr>
<td>Private residence</td>
<td>4</td>
<td>24</td>
<td>\textit{Salmonella Typhimurium} 135a (1) Norovirus (2) Hepatitis A (1)</td>
</tr>
<tr>
<td>Restaurant</td>
<td>8</td>
<td>75</td>
<td>Norovirus (3) \textit{Salmonella Johannesburg} (1) \textit{Salmonella Typhimurium} 44 (1) Hepatitis A (1) Unknown (2)</td>
</tr>
<tr>
<td>School</td>
<td>2</td>
<td>55</td>
<td>\textit{Salmonella Typhimurium} 44 (1) Suspected viral (1)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>113</td>
<td>1347</td>
<td>Norovirus (38) Suspected viral (46) Rotavirus (2) Hepatitis A (2) \textit{Cryptosporidium} (1) \textit{Listeria monocytogenes} (1) \textit{Salmonella Typhimurium} 44 (2) \textit{Salmonella Typhimurium} 135a (1) \textit{Salmonella Johannesburg} (1) \textit{Campylobacter} (1) Unknown (18)</td>
</tr>
</tbody>
</table>

* other residential facility includes: supported services accommodation, community residential units and supported residential services (9); military facilities (2); parenting centre (1) and a conference venue (1).
notified in a household contact of one of these 10 cases. The food handlers at the café were tested and found to have immunity to Hepatitis A from either a previous infection or through immunisation and as such, there was no risk of these food handlers becoming infected and prolonging the outbreak.

An outbreak of STm 44 was investigated in May. A total of 23 cases out of a total of 66 people from a rural boarding school were identified. Cases had illness onsets between 24 and 30 May 2008. There were also an additional three cases of confirmed STm 44 who had onsets between the 12 and 19 May. The descriptive epidemiology of the outbreak suggested a point source foodborne outbreak but a retrospective cohort study and environmental investigations did not provide epidemiological evidence of a specific source. The epidemiological analysis identified dinners on 23 and 24 May and breakfast and bar-b-que lunch on the 24 May as significantly associated with illness.

An outbreak of gastrointestinal illness associated with restaurant patrons was investigated in June. People from fourteen separate groups who dined at the restaurant on the same day reported gastrointestinal illness consistent with a viral aetiology. During the investigation it was discovered that a food handler, who was responsible for preparing salads and garnishes, worked at the restaurant preparing food whilst he was symptomatic with vomiting and diarrhoea. No faecal specimens were collected.

In June, a doctor from a metropolitan hospital reported severe gastroenteritis in a husband and wife and suspected that the illness was foodborne. Investigation revealed that four of five family members had become ill after sharing a number of foods at a family dinner. The only food that the well family member did not eat was a dessert made with lightly cooked eggs which was left at room temperature overnight. The four ill family members were confirmed with STm 135a infection. There were no leftover foods available for testing. One dozen eggs were sampled from the same food premises where the eggs were purchased from but no Salmonella was detected in or on the surface of these eggs.

CDCPU thanks staff from the Microbiological Diagnostic Unit, Victorian Infectious Diseases Reference Laboratory, local government environmental health officers and the Department of Human Services Regional environmental health officers for their assistance with these outbreak investigations.

**Blood borne viruses**

Nasra Higgins, Department of Human Services

**Hepatitis B—newly acquired infections**

A total of 482 cases of hepatitis B were notified during the second quarter of 2008, of which 19 (four per cent) were newly acquired infections. This was exactly the same compared to the second quarter in 2007, and a 24 per cent reduction compared to the previous quarter (n=25) (figure 1).

Of the 19 cases notified in the second quarter, 13 (68 per cent) were in males and six (32 per cent) were in females.

Those notified were aged between 23 and 63 years with a median age of 41 years. Infections were most commonly reported for the 40 to 49 year age group.

Eleven of the 19 newly acquired cases were Australian born (56 per cent), two were overseas born (10 per cent) and for the remaining six cases country of birth was unknown or not reported (table 2).

Indigenous status was reported for 84 per cent of the cases (n=16) with none reported as being Aboriginal and/or Torres Strait Islander.

**Table 2: Notified cases of newly acquired hepatitis B cases by region of birth, Victoria, April–June 2008**

<table>
<thead>
<tr>
<th>Region of birth</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceania and Antarctica</td>
<td>11</td>
</tr>
<tr>
<td>South Eastern Europe</td>
<td>2</td>
</tr>
<tr>
<td>Unknown/not reported</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

**Figure 1: Notified cases of newly acquired hepatitis B, by quarter, Victoria, January 2000–June 2008**
Eleven cases were from metropolitan Melbourne and the remaining eight cases were from regional Victoria.

Co-infection with hepatitis C was reported in six of the 19 cases (32 per cent).

Among the 19 newly acquired cases, 53 per cent of the cases (n=10) reported having symptomatic hepatitis as the reason for testing for hepatitis B. Other reasons reported included having elevated liver function tests (LFTs) (n=8), drug and alcohol screening (n=3), screened upon patient request (n=2), having a medical condition (n=1), and screened for sexually transmissible infections (n=1). (note: cases may have reported multiple reasons for testing).

Injecting drug use and sexual transmission were the main risk factors reported for eight cases and four cases respectively. Other risk factors reported included body piercing (n=1), sharing a household with a hepatitis B positive person (n=1), sharps injury in a non-health care worker (n=1), dental procedure (n=1), surgical procedure (n=1), tattooing (n=1) and having a hepatitis C positive partner (n=1). For the remaining four cases, the source of an exposure to hepatitis B was undetermined. (note: cases may have reported multiple risk factors).

**Hepatitis C—newly acquired infections**

A total of 657 cases of hepatitis C were notified during the first quarter of 2008, of which 35 (five per cent) were newly acquired infections. This was similar to the number of newly acquired hepatitis C infections reported in the previous quarter and the same period in 2007 (n=37 and 32 respectively). The half yearly total for 2008 was slightly lower compared to the same time in 2007 (figure 2).

Of the 35 newly acquired hepatitis C cases notified, 71 per cent (n=25) were in males and 29 per cent (n=10) in females. Age of those notified ranged from 15 to 60 years with a median age of 25 years. Infections were most commonly notified in the age group 20–29 years.

Seventy-three per cent of cases (n=25) were Australian born, seven were reported as overseas born and for three persons, country of birth was unknown or not reported (table 3). Indigenous status was reported for 32 cases of which two were reported as being Aboriginal and/or Torres Strait Islander.

**Figure 2: Notified cases of newly acquired hepatitis C infections, by quarter, Victoria, January 1997–June 2008**

<table>
<thead>
<tr>
<th>Year of notification</th>
<th>Number of notified cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>24</td>
</tr>
<tr>
<td>1998</td>
<td>18</td>
</tr>
<tr>
<td>1999</td>
<td>12</td>
</tr>
<tr>
<td>2000</td>
<td>16</td>
</tr>
<tr>
<td>2001</td>
<td>19</td>
</tr>
<tr>
<td>2002</td>
<td>22</td>
</tr>
<tr>
<td>2003</td>
<td>18</td>
</tr>
<tr>
<td>2004</td>
<td>17</td>
</tr>
<tr>
<td>2005</td>
<td>19</td>
</tr>
<tr>
<td>2006</td>
<td>23</td>
</tr>
<tr>
<td>2007</td>
<td>19</td>
</tr>
<tr>
<td>2008</td>
<td>25</td>
</tr>
</tbody>
</table>

Seventy-seven per cent (n=27) of the cases were from Metropolitan Melbourne: the remaining seven were from regional Victoria.

Of the newly acquired cases, patient requested screening was the main reasons for testing reported for 11 cases. For the remaining cases reason for testing included presenting with signs and symptoms (n=10), drug and alcohol screening (n=7), having elevated LFTs (n=7), screened for sexually transmissible infections (n=2), antenatal screening (n=1), having a medical condition (n=1) and other reasons (n=4). (Note: cases may have reported multiple reasons for testing).

Injecting drug use (IDU) was the main risk factor reported for 29 cases (83 per cent). Risk factors reported for the remainder included having a surgical procedure (n=2) having a HCV positive household contact (n=2), having a hepatitis C positive partner (n=1), having a sharps injury (n=1) and body piercing (n=1). Source of an exposure to hepatitis C was undetermined for three cases (Note: Multiple risks are reported for non IDUs).

**Table 3: Notified cases of newly acquired HCV by region of birth, Victoria April–June 2008**

<table>
<thead>
<tr>
<th>Region of birth</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceania and Antarctica</td>
<td>26</td>
</tr>
<tr>
<td>North-East Asia</td>
<td>2</td>
</tr>
<tr>
<td>South-East Asia</td>
<td>2</td>
</tr>
<tr>
<td>North-West Europe</td>
<td>1</td>
</tr>
<tr>
<td>Southern and Central Asia</td>
<td>1</td>
</tr>
<tr>
<td>Unknown/not reported</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
</tr>
</tbody>
</table>
Hepatitis D
Three cases of hepatitis D were notified during the second quarter of 2008 in two males and one female, age range 29 to 39 years.

Vaccine preventable diseases
James Fielding, Department of Human Services

Influenza
There were 64 cases of influenza notified in the second quarter, compared to 35 cases notified during the same period, in 2007. Consistent with the trend observed in the previous quarter, a majority of cases (58 per cent) were due to influenza type B virus infection; the remainder were influenza type A virus infections. The age range of those notified was six months to 96 years (median = 40 years); four were aged less than five years (one less than one year) and 11 were aged 65 years or older. A majority of cases (89 per cent) were residents of metropolitan Melbourne and six were identified as part of the VIDRL sentinel surveillance program. No deaths due to influenza infection were reported. One outbreak in an aged care facility was identified during the period affecting at least 16 of 49 residents and nine staff. Of 16 symptomatic people tested, nine were positive for influenza type B virus infection.

Invasive pneumococcal disease (IPD)
Eighty-five cases of IPD were notified in the second quarter, 14 (20 per cent) higher than the total for the same period in 2007 and the highest second quarter total since 2004 (figure 3). There were 13 cases in the modal 0–4 year age group of which seven were aged less than two years. There were 31 cases aged 65 years or older of which 11 were aged 65–74 years and 13 were aged 75–84 years. A further 14 cases were aged 50–64 years. There was a 1:1 ratio of male to female cases. Indigenous status data were complete for 78 cases (92 per cent) of which one was reported as being Aboriginal and/or Torres Strait Islander. Three cases (four per cent aged 68, 79 and 80 years were reported to have died as a result of their infections. Isolates from 77 cases (91 per cent) were serotyped; serotyping was not possible for a further two cases. One of the thirteen cases eligible for free conjugate vaccine under the National Immunisation Program was infected by a serotype contained within the vaccine; this case was vaccinated and was therefore a vaccine failure. Of the remaining 12 cases infected by non-vaccine or unknown serotypes, seven were fully vaccinated for age, two were partially vaccinated, one was not vaccinated and two were of unknown vaccination status. Of the 31 cases in persons aged 65 years or older, seven were infected with a serotype contained within the polysaccharide vaccine of which three cases were fully vaccinated, one was not vaccinated and the vaccination of three cases was unknown. Nineteen cases were infections with non-polysaccharide vaccine serotypes; five were fully vaccinated, six were not vaccinated, two were partially vaccinated and six were of unknown vaccination status. Of the three deaths, the two that were not vaccinated were infected with serotypes contained within the polysaccharide vaccine. The other deceased case had been vaccinated but was infected by a serotype not contained within the polysaccharide vaccine.

Pertussis
A total of 319 cases of pertussis were notified in the second quarter, an increase of 21 per cent on the 257 cases notified in the previous quarter and an 11 per cent increase on the number of cases notified during the same period in 2007. Those notified were aged between two months and 85 years of which five were aged 12 months or less; two were too young to be vaccinated, two aged three and six months were not vaccinated and a 12-month-old infant was fully vaccinated for age. A further 12 cases were in children aged between two and ten years inclusive of which eight were reported to be fully vaccinated. Figure 4 shows a decrease in the pertussis notification rate for the 15–19 years age group so far in 2008 and rates in younger age groups comparable to those of last year. Notification rates in those aged 20–29 years, 35–39 years and 45–49 years are at recent historical highs but are
generally lower in those aged 50 years or older following a peak in 2006. Sixty per cent of cases were in females and no deaths were reported.

Rubella
Four cases of rubella were notified in the second quarter bringing the total year-to-date cases in 2008 to five compared to four at the same time in 2007. All cases reported during the quarter were in females; two were aged 19 years and the others were aged 36 and 67 years. No links between—or with other known—cases were identified and none of the cases were reported to be vaccinated. Three cases reported no history of overseas travel; the other was the only case born overseas and had travelled back to her country of birth during the incubation period.

Other notifiable diseases

Invasive meningococcal disease

James Fielding, Department of Human Services

Nineteen cases of invasive meningococcal disease were notified to the department in the second quarter, four fewer than the same period in 2007. Year-to-date there were 24 cases in 2008 compared to 30 last year. Of the second quarter cases, 20 were serogroup B infections, one was a serogroup Y infection and one was unknown serogroup; there were two probable cases diagnosed on clinical criteria only. Those notified were aged from four months to 64 years: five were infants aged less than one year (seven were aged two years or less) and three were aged from 18 to 20 years. A majority of cases (63 per cent) were in males. One infant aged four months died as a result of his serogroup B infection. No epidemiological links between cases were identified.

Legionellosis

James Fielding, Department of Human Services

Twenty-two cases of legionellosis were notified in the second quarter of which 18 were L. pneumophila serogroup 1 infections, two were due to L. micdadei and two were unspecified Legionella. The age range of those notified was 30 to 83 years (median = 53 years); seven (32 per cent) were aged between 44 and 48 years inclusive. A majority of cases (77 per cent) were in males. Seven cases of L. pneumophila serogroup 1 infection with disease onsets between 11 April and 10 May were associated with an outbreak at a suburban car wash: samples taken from the premises were positive for L. pneumophila serogroup 1. Molecular analysis indicated a microbiological link between isolates recovered from two patient specimens and water samples from the car wash. A further four cases of L. pneumophila serogroup 1 notified during the period were residents of adjacent local government areas in Melbourne’s southern suburbs although no definitive source for—or links between—these or any other cases notified in the second quarter were identified.

Creutzfeldt-Jakob disease (CJD)

Genevieve Klug, Australian National CJD Registry

For the June quarter, five new Victorian suspect CJD cases were notified to the Australian National CJD Registry. All five of these cases are still under investigation. A further four previously notified suspect cases have been reclassified from suspect to confirmed CJD (2) and not CJD (2). All reclassifications were based on neuropathologic examination.

Mycobacterial infections

Lynne Brown, Department of Human Services

Tuberculosis

Owing to the slow growing nature of Mycobacterium tuberculosis, data are preliminary and subject to change. This report relates to notifications for the second quarter, April–June 2008.

Overview

There were 84 notifications of tuberculosis made to the department in the second quarter of 2008, which is a 23 per cent increase on the number of notifications for the same period in 2007. Of the 84 notifications, 51 were male (61 per cent) and 33 (39 per cent) were
The greatest number of notifications occurred in the 25–29 year age group (n=17). Another nine patients were aged between 20 and 24 years. Twenty-one per cent of patients were aged sixty years or older, and there were six children aged less than fifteen years notified in this quarter (figure 5). Three of these children were Australian born (including two siblings) and were diagnosed as a result of contact investigations. The other three children were all overseas born and had arrived in Australia within the past two years. Information about country of birth was unknown for one patient; however of the 83 notifications where country of birth was known, eighty-nine per cent were born overseas. The greatest number of notifications occurred in patients born in India (n=14 or 19 per cent). Another eleven patients were from either the Horn or West Africa and thirteen patients were born in Vietnam. Three cases were diagnosed as a result of a contact investigation and ten patients were found to have active disease as a result of their TB Health Undertaking assessment. One patient was diagnosed as a result of the screening process that is recommended for newly arrived refugees. There were no patients known to have HIV and TB co-infection in this quarter.

### Figure 5: Notifications of tuberculosis, by age group, sex and rate per 100,000, Victoria, 1 April 2008–30 June 2008

![Graph showing notifications of tuberculosis by age group and sex](image)

### Site of disease

<table>
<thead>
<tr>
<th>Site</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary only</td>
<td>44</td>
</tr>
<tr>
<td>Pulmonary and other sites*</td>
<td>8</td>
</tr>
<tr>
<td>Lymph nodes</td>
<td>20</td>
</tr>
<tr>
<td>Bone / joint</td>
<td>1</td>
</tr>
<tr>
<td>Pleural</td>
<td>4</td>
</tr>
<tr>
<td>Meningeal</td>
<td>0</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>1</td>
</tr>
<tr>
<td>Peritoneal</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
</tr>
</tbody>
</table>

*includes plural (1), lymph nodes (3), miliary (3), peritoneal (1)

Laboratory confirmation of diagnosis in some form (smear, culture, antigen detection or histology) was obtained in 87 per cent of notifications—a four per cent improvement on the same quarter in 2007, but a five per cent reduction on last quarter (table 5). Seventy-seven percent of cases were diagnosed by culture, which was a six per cent increase than for the same period in 2007 but still well under the 90 per cent target set in the National TB Strategy performance indicators. In contrast there was a 50 per cent increase in radiological diagnosis. As we face increasing levels of drug resistance it becomes even more important to ensure every effort is made

### Table 5: Confirmation of tuberculosis notifications, by diagnostic method, Victoria April–June 08

<table>
<thead>
<tr>
<th>Diagnostic method</th>
<th>Extra pulmonary TB only</th>
<th>Pulmonary TB only</th>
<th>Pulmonary TB plus other sites</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture</td>
<td>22</td>
<td>34</td>
<td>8</td>
<td>64</td>
</tr>
<tr>
<td>Microscopic examination</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>4</td>
</tr>
<tr>
<td>Histology</td>
<td>3</td>
<td>1</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>PCR/NAT</td>
<td>3</td>
<td>1</td>
<td>–</td>
<td>4</td>
</tr>
<tr>
<td>Radiological</td>
<td>3</td>
<td>7</td>
<td>–</td>
<td>10</td>
</tr>
<tr>
<td>Tuberculin test</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>44</td>
<td>8</td>
<td>84</td>
</tr>
</tbody>
</table>

PCR/NAT: polymerase chain reaction/nucleic acid testing
to confirm the diagnosis by culture and drug sensitivity testing. A better result was achieved in the case of pulmonary notifications where the diagnosis was bacteriologically confirmed in 81 per cent of patients, but this was still nine per cent lower than the first quarter of 2008. There was one case of multi-drug resistant TB and four cases with mono resistance (isoniazid) in the last quarter. Testing for HIV was reported in 76 per cent of notifications; however of those where information about testing was reported, 20 per cent were recorded not to have been tested. This is despite recommendations that HIV testing for all newly diagnosed TB patients should be included as routine practice.

Vector borne diseases

James Fielding, Department of Human Services

Alphavirus infection

There were 74 cases of Alphavirus infection notified in the second quarter of 2008, compared to 39 for the same period in 2007; 65 (88 per cent) were Ross River virus infections, eight (11 per cent) were Barmah Forest virus infection and there was one case of chikungunya virus infection. Nearly two-thirds of the Ross River virus disease cases were notified in April, with Loddon Mallee (33 per cent), Hume (30 per cent) and Gippsland (26 per cent) being the most commonly reported regions of exposure. The age range of Ross River virus disease cases was 16 to 82 years (median = 47 years) with a slight majority (52 per cent) of male cases.

The eight cases of Barmah Forest virus disease notified during the quarter were in three females and five males aged from 33 to 62 years (median = 49 years). Six cases reportedly acquired their infections in Gippsland Region, one in Hume Region and region was unknown for the other case. The one case of chikungunya virus disease was an overseas visitor whose infection was acquired in Sri Lanka.

Malaria

Twenty-six cases of malaria were notified in this quarter compared to 20 cases in the previous quarter and 41 during the same period in 2007. There were three cases in children aged three, 12 and 16 years and the remainder were aged between 18 and 87 years. The median age was 32 years. A majority of cases (62 per cent) were in males. There were 18 cases (65 per cent) due to *Plasmodium vivax* infection, of which ten were acquired in India, six in Papua New Guinea and one each in Solomon Islands and Vanuatu. The remaining eight cases were *P. falciparum* infections of which four were acquired in Sub-Saharan Africa, two in Sudan and one in Indonesia and Papua New Guinea. One case was a humanitarian arrival.

Zoonoses

James Fielding, Department of Human Services

Psittacosis

Fourteen cases of psittacosis were notified in the second quarter of 2008, compared to ten cases in both the previous quarter and during the same period in 2007. Nine cases (64 per cent) were in males. One case notified was aged 20 years and the remainder were aged between 42 and 82 years. Eleven cases were residents of metropolitan Melbourne, of which three were from the same Local Government Area, two were from Gippsland Region and one was from Grampians Region. Six cases reported exposure to domestic birds, of which five were reported to be psittacines and two also reported occupational exposure to wild birds. The remaining eight cases reported exposures to wild birds only, one of which was occupational.

Q fever

Three cases of Q fever were notified in the second quarter bringing the 2008 year-to-date total to eight, seven fewer than for the same time in 2007. The cases were in males aged 44, 47 and 65 years from different parts of regional Victoria. Two of the cases were farmers, but a likely source of infection was unable to be determined for the other case.

Sexually transmissible infections

Nasra Higgins, Department of Human Services

Chlamydia

A total of 3,206 cases of chlamydia were notified to the department during the second quarter of 2008. This was a 13 per cent increase on the number of cases notified in the previous quarter (n=2,849) and a 12 per cent increase on the number of cases notified for the same period in 2007 (n=2,782). This was also the highest quarter reported since at least 1997 (figure 6).

Fifty-nine per cent (n=1,879) of the cases were in females and 41 per cent (n=1,304) were in males. Sex was not reported for 23 cases. The age range of females was 19 days to 71 years with a median age of 22 years. The cases were notified to the department during the second quarter bringing the 2008 year-to-date total to eight, seven fewer than for the same time in 2007. The cases were in males aged 44, 47 and 65 years from different parts of regional Victoria. Two of the cases were farmers, but a likely source of infection was unable to be determined for the other case.

Indigenous status was reported for 54 per cent, of which 16 cases were reported as being Aboriginal and/or Torres Strait Islander. Note that the percentage reported here was based on the total chlamydia notifications, and during the...
second quarter of 2008, 41 per cent of the chlamydia notifications were notified from laboratories only and Indigenous status of the patient is not a routinely collected data field by laboratories. Sixty-nine per cent of the cases (n=2,222) reported had a metropolitan postcode of residence. Region of residence was not reported for 182 cases and the remainder were from regional Victoria. Enhanced data were available for 1,401 cases (44 per cent) of which screening was reported as the main reason for testing for 53 per cent of the cases followed by clinical presentation and contact tracing (28 per cent and 12 per cent respectively). Five per cent reported other reasons while for 13 cases this information was unknown.

Males
Of the 605 male cases for whom enhanced surveillance data were available, 70 per cent (n=426) reported a female sexual partner and 20 per cent (n=120) reported a male sexual partner. One case reported having both male and female sexual partners and sexual orientation was not reported or unknown for 58 cases. Among the males reporting a female sexual partner, 52 per cent (n=220) reported having a casual sexual partner, 37 per cent (n=159) a regular sexual partner and 12 cases reported sex worker as the source of infection. Sexual partner type was not reported or unknown for 34 cases. For those cases reporting a male sexual partner, 78 per cent (n=93) reported having a casual sexual partner, 16 per cent (n=19) a regular sexual partner and for the remaining eight cases this information was unknown or not reported.

Gonorrhoea
During the second quarter of 2008, the department received notifications for 231 cases representing a 10 per cent increase on the number of cases notified in the previous quarter (n=209), however the half-yearly total for 2008 showed a 17 per cent reduction compared to the half-yearly total in 2007 (figure 7). Eighty per cent of the cases (n=184) reported a metropolitan postcode of residence. Postcode of residence was not reported for 31 cases and the remainder were from regional Victoria. Indigenous status was reported for 71 per cent (n=164) of which only one case was reported as being Aboriginal and/or Torres Strait Islander.
Enhanced surveillance data were received for 66 per cent (n=152) of notifications. Among these, 85 cases (56 per cent) were tested due to clinical signs and symptoms of STIs, followed by screening (n=47, 31 per cent), contact tracing (n=12, eight per cent) and six cases reported other reasons. Reason for testing was not reported or unknown for two cases.

Males
Among the 130 male cases for whom enhanced surveillance data were available, 52 per cent (n=68) reported a male sexual partner and 35 per cent (n=41) reported a female sexual partner. For the remaining 17 cases, sexual orientation was not reported.

Of the 68 males reporting a male sexual partner, 79 per cent (n=54) reported acquiring their infection from a casual sexual partner, 15 per cent (n=10) from a regular partner and for the remainder, source of infection was unknown or not reported.

For those cases reporting a female sexual partner, 58 per cent (n=26) reported acquiring the infection from a casual partner, 13 per cent (n=6) from a regular partner and 24 per cent (n=11) reported sex worker as the source of infection. For the remaining two cases this information was unknown or not reported.

Seventy-seven per cent (n=100) reported that they acquired their infection in Victoria followed by overseas (n=16, 12 per cent) and interstate (n=five, four per cent). This information was not reported or unknown for nine cases.

Females
Of the 22 female cases for which enhanced surveillance data were available, 18 reported acquiring their infection from a casual male sexual partner, two reported acquiring the infection from a regular male sexual partner and one case reported acquiring infection from a sex worker. For the remaining case this information was unknown or not reported.

Sixteen of the 22 cases reported that they acquired their infection in Victoria, three cases reported overseas and one case reported interstate. This information was not reported or unknown for the remaining case.

Antibiotic resistance
Testing for susceptibility to ceftriaxone and ciprofloxacin was conducted for 133 and 136 isolates respectively. All of the isolates tested for ceftriaxone were sensitive. Of the isolates tested for ciprofloxacin, 74 per cent (n=101) were resistant, 24 per cent (n=33) were sensitive, and two isolates were ‘less sensitive’.

Syphilis—infectious
Between April and June 2008, a total of 208 cases of syphilis were notified of which nearly half were infectious syphilis (n=103). This was a reduction compared to the previous quarter and the same period in 2007. However, the half-yearly total was slightly higher than the half-yearly total in 2007 (figure 8).

Eighty-nine per cent of the cases (n=92) were in males aged from 18 to 68 years, with a median age of 36 years. The modal age group for males was 25 to 29 years.

There were nine cases (nine per cent) in females compared to four cases in the previous quarter and the same period in 2007. One case was reported in a transsexual and sex was unknown or not reported for the remaining case.

Of the 103 cases, 54 were primary infections, 27 were secondary infections and 22 were early latent infections. Seventy-four per cent of the cases were from metropolitan regions (n=76), 10 were from regional Victoria and postcode of residence was not reported or unknown for 17 cases. Eighty per cent of the cases (n=82) were Australian born. Indigenous status was reported for 99 cases of which two reported as being Aboriginal and/or Torres Strait Islander.
Enhanced data were collected for all infectious syphilis cases. The most commonly reported reason for testing was screening (n=55) and presenting with signs and symptoms (n=41). Seven cases reported other reasons for testing and for the remaining two cases reason for testing was not reported or was unknown.

**Males**

Of the 92 male cases reported, 77 cases (84 per cent) indicated a male sexual partner, eight (nine per cent) indicated a female sexual partner and two indicated both male and female sexual partners as the source of the infection. For the remaining five cases this information was not reported or was unknown.

Among the males reporting a male sexual partner, 86 per cent (n=66) reported acquiring their infection from a casual partner and nine per cent (n=7) from a regular partner. For the remaining cases sexual partner type was not reported or was unknown.

Eighty-five percent of the male cases (n=78) reported that they acquired their infection in Victoria, followed by overseas (n=8) and interstate (n=3). This information was not reported or was unknown for the remaining cases.

**Females**

Of the nine female cases reported, five were found by routine antenatal screening. All of the nine cases reported having acquired their infection from a male sexual partner. Four of the nine cases reported a casual sexual partner, three reported regular sexual partners and for the remaining two cases sexual partner type was not reported or was unknown.

Six of the nine cases reported having acquired their infection in Victoria, two reported overseas and for the remaining case, place of infection was unknown or not reported.

**Human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS)**

Carol El-Hayek and Danielle Horyniak, Burnet Institute

Please note that data are subject to change as a result of ongoing case investigations and annual audit of retrospective records.

**New HIV diagnoses**

Second quarter (April–June) 2008

There were 67 new HIV diagnoses during the period April–June 2008. This was similar to the number of new HIV diagnoses in the previous quarter (January–March 2008) and the same quarter last year (April–June 2007), 66 and 68 respectively (figure 9).

**Age, sex and exposure categories**

Of the 67 new HIV diagnoses in the second quarter of 2008, 57 (85 per cent) were in males and 10 (15 per cent) were in females (table 6). The proportion of new female diagnoses in this quarter was approximately double the proportion diagnosed in the previous quarter (8 per cent, n=5) and the second quarter of 2007 (6 per cent, n=4).

The median age of HIV diagnoses was 34 years for both males and females. In the previous quarter the median age of HIV diagnosis was 37 years for males and 30 years for females and 39 years for males and 29 for females in the same quarter of 2007.

---

1. "New HIV diagnoses" refers to cases whose first ever HIV diagnosis was in Victoria.
2. 2008 data are provisional.
Figure 9: New HIV diagnoses by year and quarter, January 2000–June 2008

Male homosexual/bisexual contact

Of the 57 males diagnosed between April and June 2008, 41 (72 per cent) cases were among men who have sex with men (MSM) (table 7). This was lower than the previous quarter, where MSM made up 84 per cent (n=51) of cases diagnosed and the second quarter of 2007, where 78 per cent of HIV diagnoses were among MSM (n=50).

Seventy-six percent of MSM (n=31) reported acquiring their HIV infection in Victoria (table 8) and 61 per cent (n=25) included one individual who identified as transgender.


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Total</td>
</tr>
<tr>
<td>Male to male sex</td>
<td>41</td>
<td>71.9</td>
<td>–</td>
</tr>
<tr>
<td>Male to male sex and IDU</td>
<td>3</td>
<td>5.3</td>
<td>–</td>
</tr>
<tr>
<td>IDU</td>
<td>5</td>
<td>8.8</td>
<td>0</td>
</tr>
<tr>
<td>Heterosexual contact</td>
<td>7</td>
<td>12.3</td>
<td>6</td>
</tr>
<tr>
<td>Heterosexual contact – person from an HPC</td>
<td>1</td>
<td>1.8</td>
<td>3</td>
</tr>
<tr>
<td>Other / unknown</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100</td>
<td>10</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>0–12</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
</tr>
<tr>
<td>13–19</td>
<td>2</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>20–29</td>
<td>13</td>
<td>22.8</td>
<td>2</td>
</tr>
<tr>
<td>30–39</td>
<td>21</td>
<td>36.8</td>
<td>4</td>
</tr>
<tr>
<td>40–49</td>
<td>17</td>
<td>29.8</td>
<td>2</td>
</tr>
<tr>
<td>50–59</td>
<td>2</td>
<td>3.5</td>
<td>1</td>
</tr>
<tr>
<td>60+</td>
<td>2</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100</td>
<td>10</td>
</tr>
</tbody>
</table>

1 Includes one individual who identified as transgender

3 Includes one individual who identified as transgender

5 Persons from countries with a high prevalence (>1%) of HIV
reported acquiring their HIV infection from a casual or anonymous partner (table 9). The median age of MSM HIV diagnoses was 31 years (range: 19 to 66 years), younger than the 35 years in the previous quarter and 39 years in the same quarter last year.

**Heterosexual contact**

In this second quarter of 2008, 17 cases (25 per cent) were associated with heterosexual contact. This was higher than the 12 cases (18 per cent) in the previous quarter and the 14 cases (21 per cent) in the same quarter last year (table 7). Eight (47 per cent) of the 17 cases associated with heterosexual contact were male. Four cases (24 per cent) involved people from high prevalence countries and three cases

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Victoria</td>
<td>31</td>
<td>75.6</td>
<td>146</td>
</tr>
<tr>
<td>Interstate</td>
<td>3</td>
<td>7.3</td>
<td>6</td>
</tr>
<tr>
<td>Overseas</td>
<td>3</td>
<td>7.3</td>
<td>16</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>9.8</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
<td>191</td>
</tr>
</tbody>
</table>

Table 8: New HIV diagnoses associated with male to male sex by place of infection acquired, Apr–Jun 2008, Jan–Dec 2007 and Jan–Dec 2006

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Regular</td>
<td>7</td>
<td>17.1</td>
<td>31</td>
</tr>
<tr>
<td>Casual / anonymous</td>
<td>25</td>
<td>61.0</td>
<td>109</td>
</tr>
<tr>
<td>Regular and casual</td>
<td>4</td>
<td>9.8</td>
<td>5</td>
</tr>
<tr>
<td>Unknown</td>
<td>5</td>
<td>12.1</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
<td>191</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td>Person from an HPC</td>
<td>1</td>
<td>12.5</td>
<td>3</td>
</tr>
<tr>
<td>Hetero contact with person from an HPC</td>
<td>1</td>
<td>12.5</td>
<td>2</td>
</tr>
<tr>
<td>Hetero contact with bisexual man</td>
<td>–</td>
<td>0.0</td>
<td>1</td>
</tr>
<tr>
<td>Hetero contact with IDU</td>
<td>1</td>
<td>12.5</td>
<td>1</td>
</tr>
<tr>
<td>Hetero contact with person with HIV</td>
<td>3</td>
<td>37.5</td>
<td>0</td>
</tr>
<tr>
<td>Hetero contact (not otherwise specified)</td>
<td>2</td>
<td>25.0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>100</td>
<td>9</td>
</tr>
</tbody>
</table>

(18 per cent) involved heterosexual contact with a person from a high prevalence country (table 10).

The median age of heterosexually acquired cases in this quarter was 38 years (range: 20–54 years), compared to 36 years in the previous quarter and 47 years in the same quarter of 2007.

### Incidence infections

During the second quarter of 2008, 24 cases (19 males and five females) were classified as having newly acquired HIV infections (incident infections are based on a previous negative HIV test and/or a seroconversion illness within the 12 months preceding HIV diagnosis) (table 11). These newly acquired infections constituted 36 per cent of all new diagnoses for this period. In the previous quarter, 18 cases (27 per cent of the total) were classified as newly acquired, and for the same quarter last year 22 cases (37 per cent) were classified as newly acquired.

### Acquired immunodeficiency syndrome

There were 11 AIDS notifications during the second quarter of 2008, 10 (91 per cent) of whom were male. Of these cases, seven (64 per cent) were associated with HIV contracted through MSM, two with heterosexual contact and for two cases the exposure category could not be determined. In the first quarter 2008, 12 (63 per cent) of the 19 AIDS notifications were associated with HIV contracted through MSM and in the second quarter of 2007, eight (62 per cent) of the 13 AIDS notifications were associated with MSM.

### Deaths

There were seven deaths following HIV or AIDS diagnosis notified during the second quarter of 2008, all of whom were male. This number was higher than the four males notified in the previous quarter. There were three deaths (two males, one female) in the second quarter of 2007.

### Comments

Year-to-date the number of new diagnoses is comparable with the same time period last year and the year prior. Once again, male-to-male sexual contact was the most frequently reported route of exposure to HIV.

---

**Table 11: New HIV diagnoses in Victoria, by time since last negative test or seroconversion illness, Apr–Jun 2008, Jan–Dec 2007 and Jan–Dec 2006**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Total</td>
</tr>
<tr>
<td>Less than 1 year (incident infection)</td>
<td>19</td>
<td>33.3</td>
<td>5</td>
</tr>
<tr>
<td>1 year to less than 3 years</td>
<td>11</td>
<td>19.3</td>
<td>1</td>
</tr>
<tr>
<td>3 or more years</td>
<td>7</td>
<td>12.3</td>
<td>1</td>
</tr>
<tr>
<td>No previous negative test or seroconversion illness</td>
<td>14</td>
<td>24.6</td>
<td>3</td>
</tr>
<tr>
<td>History unknown</td>
<td>6</td>
<td>10.5</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100</td>
<td>10</td>
</tr>
</tbody>
</table>

6 Includes one individual who identified as transgender
### Table 12: Notifications of notifiable infectious diseases, by Department of Human Services' region, 1 January–30 June 2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood borne diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B – newly acquired</td>
<td>11</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Hepatitis B – not further specified</td>
<td>23</td>
<td>19</td>
<td>8</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Hepatitis C – newly acquired</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Hepatitis C – not further specified</td>
<td>77</td>
<td>75</td>
<td>42</td>
<td>56</td>
<td>58</td>
</tr>
<tr>
<td>Hepatitis D</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Enteric diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botulism</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Campylobacter infection</td>
<td>277</td>
<td>251</td>
<td>120</td>
<td>118</td>
<td>193</td>
</tr>
<tr>
<td>Cryptosporidiosis</td>
<td>36</td>
<td>36</td>
<td>5</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Food/water/environmental – other</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Giardiasis</td>
<td>46</td>
<td>27</td>
<td>20</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>Haemolytic uraemic syndrome</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Hepatitis E</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Listeriosis</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Paratyphoid</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>74</td>
<td>93</td>
<td>50</td>
<td>47</td>
<td>68</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Typhoid</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Veroxin producing E.coli</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Other infectious notifiable diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creutzfeldt-Jakob disease</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Invasive meningococcal disease – group B</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Invasive meningococcal disease – group C</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Invasive meningococcal disease – other</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legionella – other</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Legionella longbeachae</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legionella pneumophila – indeterminate serotype</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legionella pneumophila 1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Leprosy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mycobacterium infection (non-TB)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Mycobacterium ulcerans</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sexually transmitted infections</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydia</td>
<td>438</td>
<td>426</td>
<td>214</td>
<td>201</td>
<td>315</td>
</tr>
<tr>
<td>Gonococcal infection</td>
<td>16</td>
<td>19</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Syphilis – infectious</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Syphilis – other</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Vaccine preventable diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Influenza</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Invasive pneumococcal disease</td>
<td>13</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Measles</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mumps</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pertussis</td>
<td>20</td>
<td>16</td>
<td>13</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rubella</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tetanus</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Zoonoses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthrax</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Psittacosis</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Q Fever</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: The data are preliminary figures only and may be subject to revision (daily surveillance reports are available online at http://www.health.vic.gov.au/ideas)
## Table 12: Notifications of notifiable infectious diseases, by Department of Human Services’ region, 1 January–30 June 2008

**ABS Est. resident population 30/06/2004**

<table>
<thead>
<tr>
<th>Disease Category</th>
<th>Victoria</th>
<th>Gippsland</th>
<th>North and West Metropolitan</th>
<th>Eastern Metropolitan</th>
<th>Southern Metropolitan</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vaccine preventable diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Legionella pneumophila</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other infectious notifiable diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typhoid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shigellosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmonellosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giardiasis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botulism</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enteric diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B – newly acquired</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood borne diseases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.coli</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grampians</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>264</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hume</td>
<td>71</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North and West Victorian Infectious Diseases Bulletin Volume 11 Issue 23 September 2008</td>
<td>4972779</td>
<td>245931</td>
<td>1455283</td>
<td>972904</td>
<td>1172463</td>
<td>4972779</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Victorian Infectious Diseases Bulletin is published quarterly and provides summaries of infectious diseases surveillance data, local news, outbreak investigations, infection control procedures, clinical cases of general interest and brief reports on original clinical or laboratory based research. The bulletin is distributed free of charge to persons with an interest in the control and treatment of infectious diseases in Victoria.

Contributions are invited on any topic dealing with the control of infectious diseases. These may be in the form of articles, short reports or letters. Lead articles will be subject to peer review. As a guide, lead articles should be no more than 2500 words with a 200 word abstract, non-peer reviewed articles 2000 words and short reports and letters 800 words. Submissions should be in Microsoft Word IBM-compatible format with Vancouver-style references. We encourage submissions in electronic format. Original data from which graphs and figures have been prepared should be included. Submissions will be edited to conform with the style of the bulletin.

The editors recognise and thank the individuals and organisations who contribute to the surveillance and management of infectious diseases. We remind authors of their responsibility to cite appropriate persons as authors and to acknowledge separately those whose work contributed significantly but did not justify authorship.

Any material included in the Victorian Infectious Diseases Bulletin may be reproduced in whole or part if appropriately acknowledged. Opinions expressed in the bulletin are those of the authors and not necessarily those of the Department of Human Services. Data are subject to revision.

This publication can be found online at: www.health.vic.gov.au/ideas

Published by the Public Health Branch, Rural & Regional Health and Aged Care Services, Victorian Government Department of Human Services

Editorial group: Hazel Clothier, Mark Veitch, Emma McBryde, James Fielding and Rosemary Lester

Production editor: Judy Bennett
Planning editor: Hazel Clothier

© Copyright State of Victoria, Department of Human Services, 2003
Authorised by the State Government of Victoria, 50 Lonsdale Street, Melbourne.

Printed by Stream Solutions
October 2008