



National Collaborating Centre  
for Infectious Diseases

Centre de collaboration nationale  
des maladies infectieuses

## ***Community-Acquired Antimicrobial Resistance***

Consultation Notes

February 10-11, 2010  
Winnipeg, Manitoba



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The National Collaborating Centre for Infectious Diseases (NCCID) is one of six National Collaborating Centres for Public Health funded by the Public Health Agency of Canada (PHAC). NCCID's mission is to serve as a bridge between research and knowledge and the practical needs of front line public health practitioners. NCCID acknowledges the complexities of public health problems and promotes the use of evidence to implement infectious disease prevention initiatives. This is accomplished through:

- Identification of knowledge gaps in research and practice
- Knowledge synthesis, translation, and exchange to incorporate evidence from research and experience into policy and practice
- Network development to support the use of evidence in public health decision-making

The National Collaborating Centre for Infectious Diseases is hosted by the International Centre for Infectious Disease, a non-profit organization located in Winnipeg, Manitoba.

### Introduction

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Infections caused by organisms that are resistant to antimicrobial compounds are of increasing concern in public health. Initially, resistant organisms were identified in hospital settings. However, in recent years, resistant organisms have also caused infections in patients with no history of hospitalization.

The epidemiology of community-acquired antimicrobial resistance (caAMR) is poorly understood. Antimicrobial-resistant organisms are of particular concern in community settings where infections can be common, severe, and easily transmitted. A wide variety of organisms are capable of developing resistance, and the associated infections can range in severity from asymptomatic to life-threatening disease.

In February 2010, NCCID hosted a knowledge exchange consultation on caAMR. The consultation focused on population-level interventions to reduce the development of antimicrobial resistance and the spread of antimicrobial-resistant bacteria in community settings. The objectives were to:

- Expand understanding of the Canadian situation with respect to caAMR, including its known epidemiology and current interventions to reduce risk and transmission
- Identify and prioritize strategies for addressing caAMR in Canada
- Clarify NCCID's role in contributing to the reduction of caAMR in Canada
- Provide opportunities for meaningful collaboration between human, animal, and environmental health experts and authorities
- Provide a venue for the exchange of national and international expertise

Fifty experts from the human, animal, and environmental health fields attended the consultation to share their experience and expertise in caAMR. Participants represented all areas of Canada, as well as the United States and European Union (see Appendix 1).



One important outcome of the consultation was a multi-stakeholder *action plan*, a series of recommendations and objectives for all participants to collaborate on during the next phase of tackling caAMR in Canada. After learning about the current caAMR situation in Canada and internationally, participants spent a day and a half working on the action plan.

### **Describing the Canadian caAMR Situation**

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On February 10, 2010, the morning was dedicated to learning more about the Canadian caAMR situation, including its epidemiology and current interventions to reduce risk and transmission. Following short presentations on NCCID (Margaret Fast) and PHAC (Howard Njoo), brief overviews were provided on three comprehensive reviews commissioned by NCCID:

- A Review of Alternative Practices to Antimicrobial Use for Disease Control in the Commercial Feedlot (Carl Ribble, Centre for Coastal Health)
- Strategies to Control Community-Associated Antimicrobial Resistance Among Enteric Bacteria and MRSA in Canada (Jeff Wilson, Novometrix Research and John Conly, University of Calgary)
- Antimicrobial Use and Resistance in Pigs and Chickens: A review of the science, policy & control practices from farm to slaughter (Richard Reid-Smith, PHAC on behalf of Leigh Rosengren, Rosengren Epidemiology)

Each presentation provided a discussion of lessons learned, priorities, and gaps in their respective areas.

This was followed by presentations on the human (Michael Mulvey, PHAC), animal (Richard Reid-Smith, PHAC), and environmental (Tom Edge, Environment Canada) aspects of antimicrobial resistance. Each presenter focused on the current epidemiology, research, surveillance, education, and stewardship initiatives in their area of expertise.

These presentations highlighted one of the key themes of the consultation, that caAMR is not only a human health care issue, but rather, that consideration must be given to the animal and environmental aspects as well. This recognizes that antibiotic resistance elements in animals (especially those that we eat) can be transferred to humans, and vice versa. Similarly, antimicrobial-resistant organisms can be released into and taken from the environment (e.g. the water we drink). Participants agreed that it is not only prudent, but mandatory to take a consilience approach to addressing caAMR in Canada.

### **Learning by Example**

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Participants at the consultation were fortunate to hear from caAMR experts from the United States and the European Union. Lauri Hicks, from the Centers for Disease Control and Prevention (CDC) in the United States, provided a keynote presentation on the Interagency Task Force on Antimicrobial Resistance. She spoke about the challenges faced in implementing the *Public Health Action Plan to Combat Antimicrobial Resistance*, first developed in 1999, and highlighted progress and lessons learned in the top priority areas. Finally, she described *Get Smart*, a comprehensive education program to change physician prescribing practices and decrease antibiotic use in communities.

Following the presentation on CDC initiatives, Stef Bronzwaer from the European Food Safety Authority spoke about the *European Community Strategy Against Antibiotic Resistance*. He described how the Community Strategy was established and how the various countries and agencies work together. He highlighted fifteen action points and touched on a number of the successes. Finally, he described in



detail the European Antimicrobial Resistance Surveillance System and the European Food Safety Authority, which monitor antibiotic-resistant organisms in people and animals and food, respectively.

Following the keynote presentations, extensive discussion ensued regarding the need to learn from the experience of other countries, including not only their successes, but also their setbacks. It was agreed that Canada should develop its own plan to address caAMR, while working closely with other nations.

### **Creating a Model for Canada**

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The rest of the consultation was dedicated to creating a multi-stakeholder *action plan* tailored to Canadian caAMR needs, requirements, and limitations. Consideration was given to old and new models developed in Canada, as well as those used internationally. For example, the final report written by the Canadian Committee on Antibiotic Resistance, *The Pan-Canadian Stakeholder Consultations on Antimicrobial Resistance* (September 2009), was referenced numerous times as a starting point.

Consultation participants categorized the necessary work into four key areas:

- Leadership (including governance, cooperation, coordination, and championship)
- Surveillance
- Research
- Education and Training for Prevention (including stewardship)

The next step was to identify objectives, actions, and one-year tasks in the four key areas, prioritize objectives based on need and impact, and assign responsible individuals/groups and timelines. All items identified in the action plan are shown in Appendix 2. However, it was agreed that not all identified actions could be accomplished in the identified time period or with the limited resources available. As such, it was determined to be a list of items for ongoing consideration; as priorities are accomplished, subsequent action items will be reviewed for feasibility and practicality.

The following actions were rated by participants as top priorities for the upcoming year and were developed further by participants:

- **Develop a national governance structure to address caAMR and establish a steering committee to lead priorities in the action plan:** Drs. Howard Njoo (Director General at the Public Health Agency of Canada) and Margaret Fast (Scientific Director at the National Collaborating Centre for Infectious Diseases) agreed to co-chair an interim caAMR Working Group (caAMR WG). The caAMR WG will be in effect for one year and will be responsible for coordinating activities related to the multi-stakeholder action plan, identifying key partners, and reporting on progress. Perhaps most importantly, the caAMR WG will champion caAMR initiatives in Canada.
- **Conduct a situational analysis of current caAMR projects:** Before creating a caAMR surveillance system in Canada, we must first understand what information is currently available in this country. This requires inventories of: ongoing surveillance programs, information technology solutions for collecting/amalgamating surveillance data, carriage data, and antibiotic usage data.
- **Improve caAMR surveillance in Canada:** After identifying what is available and what is lacking in caAMR surveillance in Canada, a priority might be to develop a system to monitor priority



organisms/diseases. For example, a pilot project may be established to coordinate the tracking of methicillin-resistant *Staphylococcus aureus* across the country.

- **Encourage research in areas where information is lacking:** It is important to understand what information is currently available in Canada and internationally; an inventory of caAMR researchers, projects, and funding agencies should be developed. This could be used to inform research gaps and would encourage funding agencies to fill those gaps.
- **Provide public caAMR education:** Education is important for increasing the public's awareness of caAMR and of the need to reduce antibiotic usage. Once key messages have been defined and validated by appropriate focus groups, public awareness materials should be developed, with targeted tools created for specific groups (e.g. teachers). Every province and territory should have access to appropriate materials. All of this should be completed following an inventory and assessment of current public education programs.
- **Promote caAMR stewardship:** While the goal will be to incorporate antimicrobial stewardship programs and principals into every public health jurisdiction (including small animal and agricultural environments), we must first define what is meant by *stewardship*. Appropriate stewardship programs must then be developed or promoted for all professional groups and facility types.

### Next Steps

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Given time constraints, the multi-stakeholder action plan was left in draft format. The PHAC/NCCID caAMR Working Group, established during the consultation, agreed to consider the plan further by filling in the blanks and working with other stakeholders to assign responsibilities for each of the prioritized tasks noted above. The caAMR Working Group will be responsible for coordinating the activities of all organizations, departments, and individuals who participate in the implementation of the priorities. An initial task for this Working Group is to determine if all AMR activities, not only caAMR, will be included in the scope of work. At the end of the one-year period (spring 2011), the Working Group will report on its accomplishments and challenges.



## Appendix 1 – Consultation Participants

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1. Allan Ronald, University of Manitoba
2. Annamarie Fuchs, Canadian Patient Safety Institute
3. Ashwani Tiwari, Canadian Food Inspection Agency
4. Carl Ribble, Centre for Coastal Health
5. Carol Loveridge, MFL Occupational Health Centre
6. Cathy Munford, Community & Hospital Infection Control Association
7. Chiebere Ogbunike, Department of Health, Nunavut
8. Chris Green, CVO Food Safety, Manitoba Agriculture
9. Diana Ludwick, MFL Occupational Health Centre
10. Elsabé du Plessis, National Collaborating Centre for Infectious Diseases
11. Ethan Rubinstein, University of Manitoba
12. Eugene Janzen, Faculty of Veterinary Medicine, University of Calgary
13. Eve Cheuk, National Collaborating Centre for Infectious Diseases
14. Fay Weller, Weller Consulting
15. Gaya Jayaraman, Public Health Agency of Canada
16. Geoffrey Taylor, Canadian Foundation for Infectious Diseases
17. Gloria Keays, Office of the Chief Medical Officer of Health, Alberta
18. Howard Njoo, Public Health Agency of Canada
19. James Irvine, Population Health Unit, Northern Saskatchewan Health Region
20. J. Trenton McClure, Atlantic Veterinary College
21. Jeff Wilson, Novometrix
22. Johann Pitout, University of Calgary
23. John M. Prescott, University of Guelph
24. John Conly, University of Calgary, Alberta Health Services
25. Kelly Bunzeluk, National Collaborating Centre for Infectious Diseases
26. Kristalyn Laryea, Public Health Agency of Canada
27. Lauri A. Hicks, Centers for Disease Control & Prevention
28. Lindsay Nicolle, University of Manitoba
29. Liz Hydesmith, National Collaborating Centre for Infectious Diseases
30. Lyle Wiebe, Consultant
31. Lynn Johnston, Association of Medical Microbiology and Infectious Disease
32. Lynora Saxinger, University of Alberta
33. Margaret Fast, National Collaborating Centre for Infectious Diseases
34. Margaret Litt, FNIHB, Health Canada
35. Margaret Gale-Rowe, Public Health Agency of Canada
36. Marissa Becker, University of Manitoba
37. Mary Carson, Do Bugs Need Drugs
38. Melissa Coleman, Canadian Foundation of Infectious Diseases
39. Michael Mulvey, National Microbiology Laboratory
40. Nick Bayliss, First Nations Inuit Health
41. Paul Sockett, Health Canada
42. Philippe Lagacé-Wiens, Diagnostic Services of Manitoba
43. Richard Reid-Smith, Public Health Agency of Canada
44. Sylvia Checkley, University of Calgary
45. Stef Bronzwaer, European Food Safety Authority
46. Susan Roberecki, Manitoba Health
47. Tim Pasma, Manitoba Agricultural, Food & Rural Initiatives
48. Tom Edge, Environment Canada
49. Tyler Stitt, Centre for Coastal Health
50. Vesna Furtula, Environment Canada





## Appendix 2 – All Actions Discussed at the Consultation, Including those Prioritized by Participants

| Leadership Objective  | Actions  |
|---|--|
| Develop a national governance structure   | Perform an environmental scan in Canada and internationally  |
|   | Identify the lead  |
|   | Coordinate with other countries  |
|   | Create pan-Canadian steering committee (include reps from Health Portfolio, stakeholder groups): reporting structure, resources, need accountability |
|   | Need a champion  |
|   | Use existing structures as models (e.g Federal Biodiversity support from other organizations to create momentum)                                     |
|   | Use CIPARS, PHNC, CCMOH/CCVO as examples for interdepartmental collaboration   |
| Create AMR steering committee   | Need to move sequentially  |
|   | Identify priority areas/strategic discussions (policy for action)  |
|   | Identify key players   |
|   | Core group should build on existing expertise in both human & animal sectors   |
|   | Core group to meet at least twice  |
|   | Develop overall vision   |
|   | Road map for the future  |
|   | Robust representation  |
|   | Core group members to be champions in their own sectors  |
| Increase profile of AMR within PHAC   | PHAC strategic plan being reviewed - will push for inclusion of AMR  |
|   | Raise AMR profile with senior management   |
| Consider changing legislation on appropriate use of antimicrobials in livestock                               | These three items were considered to be similar and inclusive of one another, and were therefore combined  |
| Policy (change/advance)   |  |
| Use policy & strategic issues to affect change  |  |
| Determine expected roles, accountabilities of pan-Canadian AMR collaborating bodies & agree on priority areas |  |



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| Investigate development of a legal framework around community AMR surveillance (similar to PHAC/ON notifiable disease reporting agreement) |  |
| Ensure appropriate messaging surrounding antibiotics - control how industry can promote antibiotics  |  |
| Ensure public health influence into regulatory approval process  |  |
| Consider regulation of reporting requirements (which AMR organisms need to be reported)  |  |
| Promote appropriate labelling  |  |
| Secure funding for structure   |  |

| Surveillance Objective                                 | Actions   |
|--|---|
| Develop a AMR surveillance system in Canada            | Identify and prioritize organisms/pathogens/diseases for AMR surveillance in human/veterinary health (importance & ease of tracking)  |
|  | Obtain baseline carriage data, possibly beginning with a test pathogen (MRSA): Contact StatsCan re health surveys and feasibility of including carriage information                         |
|  | Establish/enhance legislation regarding notifiable/reportable diseases (focus on federal level)   |
|  | Identify provincial coordinators for surveillance system  |
|  | Establish a sustainable pilot project of AMR surveillance, beginning with MRSA in provinces/territories currently tracking MRSA   |
|  | Develop AMR veterinary pathogen surveillance system that is linked to food systems  |
| Conduct a situational analysis of current AMR projects | Create an inventory of AMR surveillance data/projects currently available/underway (public health, private and public labs, CNISP, individual studies, universities, veterinary labs, etc.) |
|  | Identify IT solutions for national AMR surveillance and/or data amalgamation depending on inventory results   |
|  | Identify available carriage data  |
|  | Identify what antibiotic usage data is available (IMS, FNIH, CIPARS, CNISP)   |





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| Investigate feasibility of an antimicrobial usage surveillance system (similar to EU approach) |  |
| Develop standard data definitions for caAMR  |  |

| Research Objective   | Actions  |
|--|--|
| Develop intersections between sectors, especially those between human/animal ecosystem | Develop joint website/database, network of people that can be compounded, analysed, transected based on interest of researchers and existing databases |
|  | Mapping process of research areas, gaps, investigators and solutions for filling gaps (e.g. critical review of existing cost-benefit/economic studies) |
|  | Develop inventory of ongoing research  |
|  | Identify and prioritize research areas to develop national strategy to coordinate research   |
|  | Identify gaps and knowledge to find solutions to fill gaps   |
|  | Coordinate with governance focus group and incorporate research component  |
|  | Identify and interact with international research groups and funding agencies  |
| Obtain research Funding  | Identify research areas being funded and funding gaps: Identify funding opportunities  |
|  | Develop fund-raising strategies: Voice funding concerns to CIHR  |
| Perform cost benefit and economic analysis   | Critical review of cost-benefit studies  |
| Perform behavioural research (determinants to AM prescribing, measuring outcomes)      |  |
| Promote product development (e.g. point of care diagnostic tools)                      |  |

| Education Training Objective | Actions  |
|------------------------------|--|
| Provide public AMR education | Define the essential message ( and reaffirm essential message, possibly with focus groups) |
|                              | Develop inventory and review of evidence in existing programs, resources, and knowledge    |
|                              | Use above to address gaps (by purchasing tools, developing tools)                          |
|                              | Identify targets groups for individualized messages (although message may be the same)     |
|                              | Have public education programs in every P/T  |



|  |  |
|--|--|
|  | Encourage grassroots awareness (they in turn influence food producers, docs)   |
|  | Provide tools for those outside healthcare field (e.g. teachers)   |
|  | Look at alternative info resources (e.g. Twitter, Facebook, PDA format)  |
|  | Shift expectation of patients/animal owners that antibiotics are undesirable (e.g. prescription pad)   |
| Antimicrobial stewardship program (broad understanding in numerous environments) | Define community AM stewardship, principles and programs according to animal and human groups (possible use derived from hospital stewardship principles)  |
|  | Articulate what is meant by stewardship  |
|  | Develop inventory of AM stewardship programs (local, national, international) and outline their principals & practices   |
|  | Operationalize principles and programs according to professional groups and type of facilities (interest groups)   |
|  | Incorporate antimicrobial stewardship programs in every facility (e.g. acute care, long term care) and public health jurisdiction and small animal clinics, and agricultural commercial enterprise |
|  | Establish targets to measure programs (e.g. prescribing practices, antimicrobial use, pre and post knowledge surveys)  |
| Enhance professional education on AMR and antimicrobial use                      | Provide dr/vets/etc. with appropriate info on antibiotics (non-industry influenced)  |
|  | Integrate education training programs across disciplines (key messaging, core competencies, etc.)  |
|  | Communicate and use existing tools/resources better  |
|  | Provide feedback to physicians/vets on prescribing   |
| Develop pan-Canadian community AMR guidelines                                    | Develop or endorse existing best practice guidelines   |
|  | Develop a portal to post best practice guidelines  |



### Appendix 3 - Evaluation Results

Results from the evaluation forms suggest that the consultation was successful in meeting its objectives.

On Day 2, 35 participants were asked to complete a standard evaluation form to provide feedback on the caAMR consultation. Evaluations were collected from 26 (74%) participants. Questions were answered on a scale of 1 to 5, where 1 was strongly disagree and 5 was strongly agree. The average scores and verbatim comments are summarized below.

The background information, including the presentations provided on the NCCID (Margaret Fast), PHAC (Howard Njoo), comprehensive reviews (Carl Ribble, Jeff Wilson, John Conly, Richard Reid-Smith), and the human, animal, and environmental caAMR situations (Michael Mulvey, Richard Reid-Smith, Tom Edge)

| Score | Question   | Sample Comments   |
|-------|--|---|
| 3.8   | Sufficiently covered the most important issues in caAMR      | <ul style="list-style-type: none"> <li>• Needed better background on structure and regulation of veterinary drugs</li> <li>• Great info from the Animal &amp; Agriculture sectors</li> <li>• Didactic sessions strung together w/o stretch breaks! Ouch! However great choices for topics/speakers</li> <li>• Been through this many times. Need to see something operational that works</li> </ul> |
| 3.7   | Provided information that I had not heard before             |   |
| 4.0   | Provided information that will be useful to me in the future |   |

The keynote presentations on the caAMR strategies of the United States (Lauri Hicks, Centers for Disease Control and Prevention) and the European Union (Stef Bronzwaer, European Food Safety Authority)

| Score | Question   | Sample Comments   |
|-------|--|---|
| 4.4   | Provided a good overview of the work being done in other countries | <ul style="list-style-type: none"> <li>• Excellent EU speaker. We need to have close ongoing dialogue with EU work.</li> <li>• Fascinating presentations, particularly from the EU. I think there is a lot that can be learned from the EU program.</li> <li>• They were quite good and interesting, esp. when they talk about what worked or did not work.</li> <li>• More leadership required.</li> </ul> |
| 4.3   | Can be applied to a Canadian context                               |   |
| 4.2   | Provided information that will be useful to me in the future       |   |

The action plan was developed over the two days with input from four working groups: surveillance, education & training for prevention & control, research, and governance & leadership

| Score | Question  | Sample Comments  |
|-------|---|--|
| 4.1   | Process was effective at focusing work and priorities | <ul style="list-style-type: none"> <li>• We've done it before. This time must not let it drop</li> <li>• Productive &amp; useful meeting. I hope that you will be able to take our work &amp; move forward with it!</li> <li>• Excellent start. Deliverables are tough</li> <li>• Been through this before. Devil is in the details</li> </ul> |
| 4.1   | Was a good use of time                                |  |
| 4.3   | Will be a step in the right direction for Canada      |  |
| 3.6   | Is comprehensive                                      |  |

#### The facilitators

| Score | Question   | Sample Comments  |
|-------|--|--|
| 4.4   | Were effective at leading discussions in the right direction | <ul style="list-style-type: none"> <li>• Very well facilitated, high speed but good process. Very good participation from audience overall.</li> <li>• I was very impressed with the facilitation at this gathering. You were very effective at moving us along, even when we got "stuck". You also did an admirable job of summarizing the day 1 work.</li> </ul> |
| 4.2   | Provided sufficient time to complete all activities          |  |
| 4.5   | Maintained a neutral perspective                             |  |



|  |  |   |
|--|--|---|
|  |  | <ul style="list-style-type: none"><li>• No comments, as you all worked hard &amp; did very well</li><li>• Sometimes it was a little unclear at the beginning but they got the message across.</li></ul> |
|--|--|---|

#### The best part of the consultation

- The most productive/useful part was the final work-group where we voted on priorities & developed Action plans & benchmarks
- Networking esp. over coffee, hospitality 4-6 event to expand future meaningful dialogue
- Info sharing, focus on deliverables
- Dr. Bronzwaer's slides!
- Bringing all sectors together, and international perspective
- The focus groups. It allowed passionate & sincere discussions & contributions

#### Improvements to the consultation

- May have been useful to have done environmental scan & gap analysis re: previous & current AMR activities in Canada
- We didn't hear much from Food/Agriculture to identify their challenges to moving towards healthier public policy
- Spent your time on governance as this has repeatedly been identified as critical gap
- Reduced number of participants
- Sometimes tended to become a little academic discussion, high level of abstraction, so important to bring back to concrete way forward & action plan
- Greater commitment from PHAC to take lead of this process, didn't see any participation from Quebec, the participant list was not really obvious - seemed to possibly a convenience sample?

#### Priority areas for NCCID in the area of knowledge translation and caAMR in the future

- Produce annual report on AMR update of Canadian Activities and what the future plan is
- Mid year - include all conference participants in updates from the 4 working groups via teleconference
- Public education campaign
- Providing an overarching coordinating committee
- Having a pan-Canadian surveillance & control measures for ca-MRSA, that is not only tailored to the Southern Canadian population, but one that takes into consideration the needs and problems of the Northern part of Canada who as a result of problems in the areas of social determinants of health are plagued with easily preventable diseases - infections like CA-MRSA.
- Ensure that some "body" takes action, neutral facilitation - accelerated process

#### Additional suggestions or comments

- Excellent conference! I am optimistic that good things will come out of these sessions.
- I found noise from adjacent room really affected ability to get full benefit from some of the talks
- Good to have this consultation, painful as it is as a process
- Would love to have a brief description or bio of participants & their interests/areas
- Almost all the information was from the medical model viewpoint - we need to include community groups. It was unfortunate that the acoustics were so poor - I missed all comments from the floor unless people used the mike.
- Encourage more innovative vision/ways & more community grassroots activism