This document builds upon the recommendations from the 2002 National Policy Conference on Antibiotic Resistance and was prepared with the input of many Canadian organizations. The next phase, to be undertaken over the coming months, will be discussion with organizations identified in the Plan, modifications to meet their needs and broad stakeholder endorsement. Comments on the Plan should be sent to Rick Walter, Executive Director, Canadian Committee on Antibiotic Resistance, Fax: 604-263-7074 or E-mail: ccar@shaw.ca
Executive Summary

In May 1997, Health Canada and the Canadian Infectious Disease Society jointly sponsored Controlling Antimicrobial Resistance: An Integrated Action Plan for Canadians, the first Canadian consensus conference on antimicrobial resistance. One of the key results of the 1997 Consensus Conference was the widespread recognition of the need for the co-ordination of a focused national approach to resistance issues. In 2002, a second national conference was held to revisit the key recommendations and to test their continuing validity. Stemming from this second event, this updated National Action Plan to Combat Antibiotic Resistance has been formulated to provide renewed focus and vigour to the initiative.

Efforts to control the development and transmission of antibiotic resistance in Canada have met with limited success since they began in earnest in 1997. Canada enjoys considerably lower rates of resistance than many other developed nations and we are experiencing a decline in the total antibiotic use in this country. However, resistance rates continue to rise and resistant pathogens are no longer only found in patients of health care facilities but increasingly in the community.

This Action Plan contains a series of priority action items related to surveillance; optimal antibiotic use; infection prevention and control; and research. Each is intended to have direct impact on resistance by limiting its development or transmission. The Action Items include descriptions of the lead agency that should be responsible for successful implementation and many have specific deliverables and time lines.

While the Canadian Committee on Antibiotic Resistance intends to take a leadership role for some Action Items and play a key facilitation role in others, successful Action Plan implementation will require the commitment and resources of many other organizations. During 2004, CCAR will actively solicit the endorsement of this Action Plan by all of the key organizations that must take a leadership role as well as those responsible for the Action Plan implementation.

Action Item Overview

A summary of actions identified in the four key areas of surveillance, infection prevention and control, optimal use and research have been identified below. Of note, a number of these actions include the revitalization of earlier initiatives that were overtaken by other public health issues.

**SURVEILLANCE:**

**1a:** Current surveillance systems, including CNISP and CIPARS, will be expanded to include a wider variety of facilities and organisms. Health Canada, the Canadian Hospital Epidemiology Committee and CCAR will consider a pilot project for a new real time surveillance system to monitor resistance patterns in one key area of interest by the end of 2004.
1b: In 2005, Health Canada, provincial Ministries of Health, the Canadian Hospital Epidemiology Committee, CCAR and IMS Health will discuss mechanisms to collect, analyze and compare antibiotic use data from human health care facilities and from retail pharmacies.

2: Health Canada and key provincial Ministries of Health and Agriculture, in conjunction with CCAR and other stakeholders, will form or revitalize Steering Committees on Surveillance in 2004 to escalate current efforts to monitor antibiotic use and resistance in human health and agri-food settings.

3: CEQA-AGAR, with support from Health Canada and provincial laboratories, will restart their efforts by the end of 2005 to ensure existing and emerging resistance is monitored and that laboratory methodologies are standardized.

**Infection Prevention and Control:**

4: CHICA and CCAR will work in conjunction with the Alberta Ministry of Health and Wellness to identify a Provincial coordinator for infection prevention and control. They will require access to adequate infection prevention and control resources in all health care and selected non-health care public settings (e.g. day cares, prisons) by 2006. This will form a pilot program which can then be implemented widely across Canada with support from Health Canada and Provincial Ministries of Health.

5: CHICA, in conjunction with CCAR and Do Bugs Need Drugs, and with funding from Health Canada and the Alberta Ministry of Health and Wellness, will form a Working Group to develop codes of best practice, accreditation standards and performance indicators for hygiene and asepsis outcomes and consider implementation of supportive provincial and national education programs by the end of 2004.

6: CHICA, in conjunction with CCAR and other organizations, will advertise the publication of the RICH report and assist Health Canada to complete the SPICE efforts by the Spring of 2005.

7: CCAR and CHICA will immediately revitalize CCAR’s Infection Prevention and Control Working Group to facilitate partnerships between the new National Public Health Agency and infection control practitioners across Canada.

**Optimal Antibiotic Use:**

8: Health Canada and the Provincial Ministries of Health will assist CCAR in retaining access to the IMS Health CompuScript database and initiating access to Provincial drug benefit data sets for rapid analysis and results distribution.

9: Health Canada and Provincial Ministries of Agriculture, through CIPARS and in conjunction with the Canadian Veterinary Medical Association and the Canadian Animal Health Institute, will lead the development of data collection, analysis and reporting efforts on the use of antibiotics in agriculture and aquaculture.
10: CCAR will work with Provincial Ministries of Health, Health Canada and others to convert current data to Defined Daily Dose (DDD), compare the data among jurisdictions, provide recommended actions and widely disseminate the information

11: CCAR will work with their professional association members and the Canadian Hospital Epidemiology Committee in 2005 to develop national standards for antibiotic use and to provide continuing education modules funded, in part, by Health Canada’s Best Practices Contribution Program

12: The Canadian Veterinary Medical Association, in conjunction with their provincial counterparts and producer associations, will undertake a pilot project by the end of 2005 to develop a practice specific guideline on prudent use in a major production animal species and to determine its impact on the producers and on the levels of antibiotic use

13: The Canadian Veterinary Medical Association, in conjunction with their provincial counterparts and producer associations, will create expert Working Groups to provide policy guidance and pilot projects to promote prudent antibiotic use

RESEARCH:

14: The Institute for Infection and Immunity (III) will adopt the four strategic research priorities listed below and prepare Requests for Proposals from the research community. III will ensure that antibiotic resistance research carried out under its mandate, is linked to this National Action Plan

- Determine the utility and cost benefit of infection prevention measures, screening and alternate therapies as they affect colonization and infection rates
- Better understand the ecology of antibiotic resistance
- Quantify the impact of resistant organisms in non-acute settings in terms of outcome
- Quantify the contribution to antibiotic resistance in humans made through the use of antibiotics in agri-food and veterinary medicine
<table>
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<tr>
<th>#</th>
<th>ACTION</th>
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<tr>
<td>1a</td>
<td>Expand current surveillance systems, including CNISP and CIPARS, to include wider variety of facilities and organisms. Establish a pilot project for a new real time surveillance system to monitor resistance patterns in one key area of interest.</td>
<td>Health Canada, the Canadian Hospital Epidemiology Committee and CCAR</td>
<td>2004</td>
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<td>1b</td>
<td>Discuss mechanisms to collect, analyze and compare antibiotic use data from human health care facilities and from retail pharmacies.</td>
<td>Health Canada, provincial Ministries of Health, Canadian Hospital Epidemiology Committee, CCAR and IMS Health</td>
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<td>2</td>
<td>Form or revitalize Steering Committees on Surveillance to escalate current efforts to monitor antibiotic use and resistance in human health and agri-food settings.</td>
<td>Health Canada and key provincial Ministries of Health and Agriculture, CCAR, other stakeholders</td>
<td>2004</td>
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<td>3</td>
<td>Restart efforts to ensure existing and emerging resistance is monitored and that laboratory methodologies are standardized.</td>
<td>CEQA-AGAR, Health Canada and provincial laboratories</td>
<td>2005</td>
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<td>Identify a Provincial coordinator for infection prevention and control. They will require access to adequate infection prevention and control resources in all health care and selected non-health care public settings (e.g. day cares, prisons). This will form a pilot program which can then be implemented widely across Canada.</td>
<td>CHICA, CCAR in conjunction with the Alberta Ministry of Health and Wellness, Health Canada and Provincial Ministries of Health</td>
<td>2006</td>
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<td>5</td>
<td>Form a Working Group to develop codes of best practice, accreditation standards and performance indicators for hygiene and asepsis outcomes and consider implementation of supportive provincial and national education programs.</td>
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<td>2004</td>
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<td>6</td>
<td>Advertise the publication of the RICH report and assist Health Canada to complete the SPICE efforts.</td>
<td>CHICA, CCAR and other organizations</td>
<td>Spring 2005</td>
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<td>7</td>
<td>Revitalize CCAR’s Infection Prevention and Control Working Group to facilitate partnerships between the new National Public Health Agency and infection control practitioners across Canada.</td>
<td>CCAR and CHICA</td>
<td>2004</td>
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<td>9</td>
<td>Development of data collection, analysis and reporting efforts on the use of antibiotics in agriculture and aquaculture.</td>
<td>Health Canada and Provincial Ministries of Agriculture, CIPARS, Canadian Veterinary Medical Association, Canadian Animal Health Institute</td>
<td>ongoing</td>
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<td>10</td>
<td>Convert current data to Defined Daily Dose (DDD), compare the data among jurisdictions, provide recommended actions and widely disseminate the information</td>
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<td>11</td>
<td>Develop national standards for antibiotic use and to provide continuing education modules funded, in part, by Health Canada’s Best Practices Contribution Program</td>
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<td>Establish a pilot project to develop a practice specific guideline on prudent use in a major production animal species and to determine its impact on the producers and on the levels of antibiotic use</td>
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**PROCESS DESCRIPTION**

In May 1997, Health Canada and the Canadian Infectious Disease Society (now Association of Medical Microbiology and Infectious Disease Canada) jointly sponsored *Controlling Antimicrobial Resistance: An Integrated Action Plan for Canadians*, the first Canadian consensus conference on antimicrobial resistance. One of the key results of the 1997 Consensus Conference was the widespread recognition of the need for the co-ordination of a focused national approach to resistance issues. In response to this recommendation, the Canadian Committee on Antibiotic Resistance (CCAR) was established in 1998 and is now the central coordinating body for Canadian activities in the field of antimicrobial resistance. A Report Card on all the other recommendations from the 1997 Consensus Conference is included in Appendix A. It clearly shows that Canada has achieved only limited success on implementing the recommendations and that considerably more effort is required if we are to successfully limit the development and transmission of resistance.

CCAR hosted the 2002 National Policy Conference on Antibiotic Resistance to revisit key recommendations emanating from the 1997 conference and to test their continuing validity. The conference attendees also marked the milestones already achieved in the struggle against resistance, identified areas of consensus and debate among subject-matter experts and set priorities for the next phase in the development of an integrated action plan.

The 1997 conference focused primarily on human health aspects of antimicrobial resistance and the impact of antimicrobial usage in the agri-food sector was not generally discussed. The 2002 conference considered both human health care and agriculture/aquaculture in four key areas: surveillance, optimal antibiotic use, infection prevention and control, and research.

CCAR Working Groups were activated with a mandate to feed into a multi-stakeholder National Action Plan Task Force, made up of members from the CCAR Executive Committee. The Task Force is responsible for developing the National Action Plan and continues to assist in soliciting input and commitment from the broader community and various levels of government.
INTRODUCTION

A global trend of increasing drug resistance, with wide variations at local levels, is well-documented in the research literature. Antimicrobial resistance is now a global problem. Widespread resistance to “first line” antimicrobial drugs is accelerating rapidly although resistance rates differ considerably from country to country and among geographic regions of larger nations.

In many cases, national governments have taken it upon themselves to develop strategies to address the problem of resistance within their borders. Recognizing that these resistant infections do not respect national boundaries, the World Health Organization has developed a series of recommendations to address antimicrobial resistance, to protect the international community and to provide guidance for those countries that can not, or have not, developed national strategies of their own. Both the United States Food and Drug Administration and the World Health Organization have called for the development of complex, coordinated interventions which target both health care providers and their patients while simultaneously exerting a positive influence on the environments in which they operate.

The confluence of economic and globalization pressures are forcing many pharmaceutical companies to abandon their efforts to identify, develop and commercialize new antibiotics. Over the past few years, Bristol Myers Squibb, Abbott Laboratories, Eli Lilly and Wyeth have discontinued or significantly scaled back their research efforts on antibiotics to focus on other therapies for other diseases. As well, a number of antibiotics are no longer being manufactured due to small profit margins and declining sales.

As resistance rates rise, newer and much more costly antibiotics are required to replace the cheaper first and second line choices which are becoming ineffective for treating resistant pathogens. As well, hospitalization costs rise due to the need for special patient handling and infection prevention and control measures.

In order to ascertain the economic and social impact of antibiotic resistance, in 2002 CCAR commissioned the report Antimicrobial Resistance: A Deadly Burden No Country Can Afford to Ignore.

A number of important conclusions were reached in this study which estimated the cost to the Canadian health care system if levels of resistance rose to those that currently exist in USA. Rapid escalation in drug costs alone could increase from the current $660 million per year to over $1.8 billion. As well, direct hospitalization costs could soar from a current minimum of $14 million to a projected $187 million per year. From a societal aspect, the quality of lives will be further diminished by the personal tolls which drug resistance can add to already serious medical conditions. Finally, the important public policy implication in this report is recognition that Canada needs persistent, coordinated leadership and support for efforts consistent with current national and international action plans against a growing global public health menace.

The extent of drug resistance varies on a global, regional and even institutional basis. While Canada enjoys considerably lower rates of resistance than the US we have considerably higher rates than in some developed nations, including Denmark and Iceland. Within institutions, risk tends to be highest in certain areas such as medical or surgical intensive care units or burns units.
Risk to an institution also can be affected by increased levels of resistance within neighboring institutions.

Each year thousands of cases of food-derived infections occur, many of which are resistant to antibiotics. Key reservoirs of these pathogens exist in our food animals. While little is understood about the development of these organisms, it is widely believed that antibiotic use in animal agriculture is a major contributing factor to resistance in human pathogens. Key reservoirs of these pathogens exist in our food animals, the most prominent include *Salmonella enterica* and *Campylobacter jejuni*.

The Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) coordinates a series of demonstration projects in Canada as an integrated system in the agri-food sector. The system is modeled on activities in Europe and the US for monitoring antimicrobial use and the development of resistance in a limited number of bacterial organisms from human, animal and food sources across Canada. These data facilitated the development of regulatory decisions and intervention strategies to limit the development and transmission of resistance.

The 2002 CIPARS report provides a summary of the 1993-2001 passive surveillance data on *Salmonella* and *Shigella* from human clinical cases, active surveillance data collected from abattoirs across Canada, a summary of the 1999-2002 passive surveillance data on *Salmonella* from animal clinical specimens, and statistics on human antimicrobial use from IMS Health. Data on active surveillance programs to describe resistance in human *Salmonella* isolates and antimicrobial use in animals are expected to be included in the 2003 CIPARS report.

Much of the incentive to monitor use of antibiotics in agriculture has come from foreign sources which impact Canada’s trade in agricultural products. Health Canada’s response to this external pressure was to develop CIPARS and identify considerable new financial and human resources to deal with the problem. Similar strides in assigning resources from Health Canada were not forthcoming for the human health activities related to resistance.

To date, most Canadian projects pertaining to antibiotic resistance and its effects on human and animal health have been individual initiatives, organized to address specific concerns of their sponsors. These projects have generally been short term and limited in scope. This situation has resulted in a fragmented approach to issue management with considerable duplication of effort and extensive, strategic gaps.

A multifaceted, national approach is needed to address the many dimensions of this problem as resistance within a wide range of microbes is emerging not only in hospitalized populations, but also in human communities and food animal production businesses. These resistant organisms spread rapidly once introduced and established, in part, by cross-border commerce and travel.

This National Action Plan is intended to have components to limit antibiotic resistance that would:

- Facilitate national and provincial vision and leadership;
- Encourage and identify adequate resourcing (human and financial) for local, regional, provincial and national antimicrobial resistance programs; and
- Support the provision of objective, Canadian data concerning antibiotic use, and the extent of resistance to particular drugs and among particular pathogens.
BACKGROUND

Methicillin Resistant *Staphylococcus aureus*

The percentage of *Staphylococcus aureus* isolates identified as MRSA (methicillin-resistant *Staphylococcus aureus*) in all Canadian Nosocomial Infection Surveillance Program (CNISP) hospitals was estimated at less than 1% in 1995. As shown in Table 3.1, this figure rose every subsequent year to over 5% by 1998 and 8.3% by 2000. The 2002 annual report from Ontario’s Chief Medical Officer of Health noted that “in Ontario alone, new cases of MRSA increased 20 fold between 1994 and 2000”. Although alarming, as shown in Table 3.2, these levels of resistance compare favorably to current rates of over 50% in many US hospitals.

Table 3.1 MRSA Rate per 100 Staphylococcus aureus 1995 – 2002
Source: Canadian Nosocomial Infection Surveillance Program

![Chart showing MRSA rate per 100 Staphylococcus aureus from 1995 to 2002]

Table 3.2 MRSA Incidence in Canada and USA

![Chart showing MRSA percentages in Canada and USA from 1983 to 2003]
Vancomycin Resistant Enterococci (VRE)
Monitoring of other drug resistant organisms largely relies on passive, anecdotal reporting. CNISP initiated prospective studies of VRE (vancomycin-resistant enterococci) in 1999. Studies were then extended to include extended spectrum beta-lactamase (ESBL) resistance among gram-negative organisms in 2001. Canada’s first major VRE outbreaks in Toronto (1995), Saskatoon (1996), and Montérégie, Quebec (1998) began some two years after this organism was first detected in Canada. VRE prevalence has stabilized at around 0.5% of isolates in Canada versus 0.3% in 1989, 7.9% in 1993, and upward of 25% today in US facilities.

Extended Spectrum Beta-Lactamase (ESBL)
Thirty-five percent of gram-negative clinical isolates exhibited new forms of beta-lactamase-mediated resistance in a 1992 study of one hospital’s ICU and hospital-wide antibiograms. A 1998 CNISP survey of 15 labs found ESBL resistance in 0.1-0.7% of E. coli and 0.2-2.5% of K. pneumoniae isolates.

Others
The National Centre for Streptococcus found diminished penicillin sensitivity when comparing Streptococcus pneumoniae isolates received during the 1992-1995 period (7.8%) compared to those received in the 1996-1997 timeframe (10.2%). This compared with an increase from 7.9% to 25.3% from 1996 to 1998 according to a Quebec reference lab’s experience or higher rates for 1999-2000 in British Columbia (US reports from 1997-1999 indicated 25% resistance along with rising macrolide and fluoroquinolone resistance rates). Similarly, 9.6% of 52 Neisseria meningitidis isolates from Ontario exhibited decreased susceptibility to penicillin in 1997 versus 34.6% of 55 in 2000. S. pneumoniae and N. meningitidis are leading causes of meningitis and sepsis in children and young adults.

The CIPARS 2002 report shows that resistance to one or more antimicrobials was 80%, 79% and 31% of generic E. coli isolated from chicken, swine and cattle respectively. Forty eight percent of chicken and 45% of swine Salmonella isolated from abattoir samples were resistant to one or more antimicrobials. For antimicrobials of greatest importance to human health, no resistance was observed to fluoroquinolones but resistance to ceftiofur was observed in 10% of E. coli and 12% of Salmonella isolated from healthy chickens at slaughter.

Resistance has also been increasing in organisms that tend to infect Canadians in community settings. Many Canadians suffer from food or water borne infections. In 1998 over 7,000 cases of salmonellosis, 14,000 cases of campylobacteriosis and almost 1,500 cases of E. coli infection were reported. An ESBL E. coli outbreak in a long-term care facility reportedly contributed to three deaths. While outbreaks of this nature receive considerable media attention, most cases go unreported. Because of the lack of data on these and other enteric pathogens, we have a poor understanding about the development and transmission of resistant strains. While antibiotic use in agriculture is an important factor in increased rates of resistance, other factors are also involved including current intense production systems.

Canada’s Advisory Committee on Animal Uses of Antimicrobials and Impact on Resistance and Human Health published a report in June 2002 which discussed the agricultural issues. The content and recommendations from that report provide considerable detail on the key issues and is an excellent information resource for those with an interest in the agri-food sector. The recommendations related to the agri-food sector made in this National Action Plan support the findings of the Advisory Committee.
KEY ISSUES

Four key issue areas have been selected for attention in this Action Plan: Integrated Surveillance, Infection Prevention and Control, Optimal Antibiotic Use and Research. Each issue area is described in greater detail below and separated into human health and agriculture. A series of recommendations provided from the 2002 National Policy Conference is provided as well as the actions taken to address the issue since the Policy Conference took place. Finally specific Action Items stemming from each recommendation is described. The Action Items are summarized on page 2.

A. Integrated Surveillance

Human Health
A true population-based national surveillance network for community acquired drug resistant micro-organisms does not exist and represents the most pressing current need in Canada. Available data sets and reports provide a fragmented and incomplete picture to guide our understanding of the evolving situation.

For example, the most recent Canadian national infection-site-specific incidence density rates are from 1986. More current information is available but it is often incomplete and provides a fragmented, non-representative view of the situation.

CNISP is an important voluntary network and holds our best promise to produce useful information concerning hospital-based care. However, it over-represents large teaching hospitals, encompasses roughly 5% of all Canadian hospitals and is hampered by meager resources. CNISP is a joint effort by the Canadian Hospital Epidemiology Committee and Health Canada.

IMS Health monitors prescriptions of a wide range of drugs including antibiotics. This information is provided for a fee to data users. It is also provided at no charge to the Canadian Committee on Antibiotic Resistance (CCAR) which posts the information annually on its web site (www.ccar-ccra.org). The information facilitates interprovincial comparisons as well as provides trend information for each antibiotic class.

CNISP is threatened every year due to lack of long-term funding from Health Canada and competing priorities. Although CNISP is the only national surveillance system that we currently have to monitor resistance in health care facilities, it is inadequate and receives considerably less human and financial resources than the comparable system in the agri-food sector (CIPARS).

Agri-Food and Veterinary Medicine
It is difficult to understand the impact that antibiotic use in food animals has on resistance rates in the human population. Current information is inadequate to even begin to quantify the magnitude of the problem. There is almost a total absence of surveillance systems for determining the presence of resistant strains and few mechanisms are available for data collection and sharing for agricultural antibiotic use. The data that are available tend to be non-standardized, collected in an unsystematic way and generally do not meet international standards such as the US NARMS system.
The 2002 CIPARS Report offers the most current, valid and national data available on antibiotic resistance in the food chain. Future surveillance data will be more comprehensive, enabling in-depth analysis of trends and correlations between antimicrobial use and resistance in livestock, food and human populations.

CIPARS will eventually permit analysis of temporal trends of use and resistance, and their correlation among livestock populations. Potential explanations for species differences include differing antimicrobial exposures, animal husbandry practices and species-specific bacterial populations may also be identified. In an effort to better understand the complexities of antibiotic use in our agri-food system, epidemiologic research is being conducted to identify risk factors for the development and spread of resistance along the food chain.

**Recommendation 1:**
A series of population-based, real time surveillance systems should be established to monitor resistance patterns, drug use, costs and outcomes and to demonstrate the extent of the problem in both humans and animals. Both existing and emerging resistance must be effectively and accurately captured by testing laboratories. These systems should be rolled out based on the results of local pilot programs.

**Action Taken:** CNISP continues track resistance rates among hospitals currently in the system. No expansion plans are being considered at this time.

**Action Taken:** CIPARS has initiated a series of pilot projects to provide key data sets on antibiotic resistance in selected agri-food sectors.

**Action Taken:** CCAR has completed an inventory of information collection methodologies for invasive *Streptococcus pneumonia* from various provincial and territorial stakeholders.

**Action Item 1a:** Current surveillance systems, including CNISP and CIPARS, will be expanded to include a wider variety of facilities and organisms. Health Canada, the Canadian Hospital Epidemiology Committee and CCAR will consider a pilot project for a new real time surveillance system to monitor resistance patterns in one key area of interest by the end of 2004.

**Action Item 1b:** In 2005, Health Canada, provincial Ministries of Health, the Canadian Hospital Epidemiology Committee, CCAR and IMS Health will discuss mechanisms to collect, analyze and compare antibiotic use data from human health care facilities and from retail pharmacies.
Recommendation 2:
Identify champions, especially in the federal government, and create a working group to move agenda for surveillance forward (including both human and animal experts)

**Action Taken:** Health Canada has created inter-departmental science and policy committees led by the Veterinary Drugs Directorate to address the development of departmental policies on antimicrobial resistance.

**Action Taken:** A National Steering Committee on Antibiotic Resistant Enterics has been formed between Health Canada, Canadian Food Inspection Agency and the provincial departments of agriculture in Alberta, Ontario and Quebec.

**Action Taken:** In April 2003, the Steering Committee on Monitoring Antimicrobial Use in Agri-Food and Veterinary Medicine was formed with Health Canada, Fisheries and Oceans Canada, Canadian Food Inspection Agency and the provinces of British Columbia, Alberta, Ontario and Quebec.

**Action Taken:** The Canadian Committee on Antibiotic Resistance formed a Surveillance Working Group which meets on an infrequent basis in response to specific issues to be addressed.

**Action Item 2:** Health Canada and key provincial Ministries of Health and Agriculture, in conjunction with CCAR and other stakeholders, will form or revitalize Steering Committees on Surveillance in 2004 to escalate current efforts to monitor antibiotic use and resistance in human health and agri-food settings

Recommendation 3:
Ensure that external quality assurance is an integral part of the process.

**Action Taken:** CEQA-AGAR has distributed laboratory guidelines on the identification, testing and reporting of MRSA, VRE, PSRP and ESBLs to Canadian clinical microbiology labs. Consistent proficiency testing has not yet been implemented in some provinces. Funding for CEQA-AGAR has been discontinued.

**Action Item 3:** CEQA-AGAR, with support from Health Canada and provincial laboratories, will restart their efforts by 2005 to ensure that laboratory methodologies are standardized
B. Infection Prevention and Control

**Human Health**
The National Advisory Committee on SARS and Public Health was established in May 2003 to provide a third party assessment of current public health efforts and lessons learned for ongoing and future infectious disease control. The report identified many systemic deficiencies in the response to SARS, many of which reflect on our ability to deal with infection prevention and control for antibiotic resistant pathogens. Among these were: lack of surge capacity in the clinical and public health systems; difficulties with timely access to laboratory testing and results; absence of protocols for data or information sharing among levels of government; uncertainties about data ownership; inadequate capacity for epidemiologic investigation of outbreaks; lack of coordinated business processes across institutions and jurisdictions for outbreak management and emergency response; inadequacies in institutional outbreak management protocols, infection control, and infectious disease surveillance; and weak links between public health and the personal health services system, including primary care, institutions, and home care.

These deficiencies are widespread across Canada and place Canadians in jeopardy for a variety of infectious diseases including those resistant to antibiotics.

**Agri-Food and Veterinary Medicine**
A number of alternatives to the use of antibiotics in food animals have been identified by the National Advisory Committee on Animal Uses of Antimicrobials and Impact on Resistance and Human Health (report released June 2002). These include the use of on-farm management practices and other infection prevention strategies which are consistent with farm quality assurance programs. These can include the use of vaccines, herbs, probiotics, novel peptides or antibodies and immune potentiators. As well, research is needed to explore new alternatives for disease control, growth promotion and enhancing feed efficiency.

**Recommendation 4:**
Expand and adequately resource infection prevention and control systems in acute and long term care facilities as well as in community settings and identify a Provincial Coordinator for infection prevention and control

**Action Taken:** Alberta Health and Wellness has developed a Provincial Action Plan to deal with antibiotic resistance with a focus on surveillance, optimal antibiotic use and infection prevention.

**Action Item 4:** CHICA and CCAR will work in conjunction with the Alberta Ministry of Health and Wellness identify a Provincial coordinator for infection prevention and control. They will require access to adequate infection prevention and control resources in all health care and selected non-health care public settings (e.g. day cares, prisons) by 2006. This will form a pilot program which can then be implemented widely across Canada with support from Health Canada and Provincial Ministries of Health.
**Recommendation 5:**
Develop codes of best practice and performance indicators for hygiene and asepsis outcomes and deliver supportive educational campaigns (including a hand hygiene effort).

**Action Item 5:** CHICA, in conjunction with CCAR and Do Bugs Need Drugs, and with funding from Health Canada and the Alberta Ministry of Health and Wellness, will form a Working Group to develop codes of best practice, accreditation standards and performance indicators for hygiene and asepsis outcomes and consider implementation of supportive education programs by the end of 2004.

**Recommendation 6:**
Finalize the infection control resource reports (SPICE and RICH), disseminate to key stakeholders within 6 months and encourage implementation.

**Action Taken:** The RICH report was published in 2003.

**Action Item 6:** CHICA, in conjunction with CCAR and other organizations, will advertise the publication of the RICH report and assist Health Canada to complete the SPICE efforts by the Spring of 2005.

**Recommendation 7:**
Develop local and regional partnerships, where they do not exist, among public health and infection control practitioners.

**Action Item 7:** CCAR and CHICA will immediately revitalize CCAR’s Infection Prevention and Control Working Group to facilitate partnerships between the new National Public Health Agency and infection control practitioners across Canada.

**C. Optimal Antibiotic Use**

**Human Health**

While some success has been achieved in reducing the number of prescriptions of first line antibiotics, we continue to see an increase in the prescriptions for newer, broad spectrum antibiotics (i.e. macrolides and quinolones). Table 5.1 shows the trends in prescriptions per thousand population from 1997 to 2002 (data provided by IMS Health). Detailed prescription data by province is available on the CCAR Web site at: [http://www.ccar-ccra.ca](http://www.ccar-ccra.ca)

Several regional efforts are underway to curb inappropriate prescribing including the Do Bugs Need Drugs program and the Partners for Appropriate Anti-infective Community Therapy (PAACT). More information on each of these programs is provided in Appendix B.

Practitioners in Ontario and Alberta have endorsed the Dutch antibiotic sparing guidelines. These guidelines are also expected to be endorsed by the American Academies of Pediatrics and Family National Action Plan to Address Antibiotic Resistance.
Physicians. National professional societies in Canada have yet to consider endorsing these guidelines.

Table 5.1 Trends in Prescriptions Per Thousand Population from 1997 to 2002 (data provided by IMS Health)
**Agri-Food and Veterinary Medicine**

The Canadian agricultural antibiotic distribution system is diverse and highly fragmented. Due to the lack of stringent procedures for antibiotic importation, distribution and use, control measures and data capture face considerable barriers. Further complicating the situation are the current practices of over the counter (OTC) sale of antimicrobials, drug use without prescription, economic dispensing incentive among veterinarians, extra label use and direct importation of active ingredients.

Antimicrobials are administered to food animals for a multitude of purposes. These include therapeutic and preventative strategies, growth promotion, production efficiency and performance enhancement. The impact of this is felt in veterinary medicine since non-therapeutic use increases the rate of resistance development. This, in turn, reduces the effectiveness of available antimicrobials for the treatment of infections. Furthermore, it can result in the use of antimicrobials which are important to human health. The correlation of fluoroquinolone-resistant human *Campylobacter* infections to the drugs licensed for use in food animals provides a case in point.

Availability and accessibility of antibiotics for agricultural use also provide additional complicating factors related to increased antibiotic resistance. Farmers are able to legally import antimicrobials from overseas retailers (or through Internet) for use in their own animals under ‘own-use’ provisions.

While the Canadian Veterinary Medical Association has issued general and specific prudent antibiotic use principles, there are few incentives to implement them. There is also a lack of awareness on resistance issues among producers and veterinarians alike.

**Recommendation 8:**

Implement measures to facilitate the collection, analysis and reporting of the quantity and distribution of antibiotics being used in our human health care system to compare with other jurisdictions and to facilitate the formulation of appropriate interventions

**Action Taken:** CCAR and IMS Health (CompuScript database) continue to share data on the number of antibiotic prescriptions filled through retail pharmacies and annually post the information on the CCAR Web site.

**Action Item 8:** Health Canada and the Provincial Ministries of Health will assist CCAR in retaining access to the IMS Health CompuScript database and initiating access to Provincial drug benefit data sets for rapid analysis and results distribution

**Recommendation 9:**

Implement measures to facilitate the collection, analysis and reporting of antibiotic use monitoring data to track the use of antibiotics for growth promotion, prophylaxis and therapy in agriculture and aquaculture to compare with other jurisdictions and to facilitate the formulation of appropriate interventions

**Action Taken:** CIPARS has initiated a series of pilot projects to provide key data sets on antibiotic use in agriculture.
**Action Item 9:** Health Canada and Provincial Ministries of Agriculture, through CIPARS and in conjunction with the Canadian Veterinary Medical Association and the Canadian Animal Health Institute, will lead the development of data collection, analysis and reporting efforts on the use of antibiotics in agriculture and aquaculture

**Recommendation 10:**
Obtain, analyze and disseminate data/information on antibiotic use in humans and animals in a timely manner and present it in standard formats which can be used for comparison (e.g. Defined Daily Dose)

**Action Taken:** The BC Ministry of Health, in a pilot program, has converted their antibiotic use data to Defined Daily Dose (DDD).

**Action Taken:** CIPARS is undertaking a series of pilot projects some of which are intended to facilitate the collection of data on antibiotic use in agriculture.

**Action Item 10:** CCAR will work with Provincial Ministries of Health, Health Canada and others to convert current data to Defined Daily Dose (DDD), compare the data among jurisdictions, provide recommended actions and widely disseminate the information

**Recommendation 11:**
Develop national standards for continuing competency for health care professionals involved in antibiotic use

**Action Item 11:** CCAR will work with their professional association members and the Canadian Hospital Epidemiology Committee in 2005 to develop national standards for antibiotic use and to provide continuing education modules funded, in part, by Health Canada’s Best Practices Contribution Program

**Recommendation 12:**
Convene expert groups to develop practice specific guidelines on prudent use of antimicrobials in animals

**Action Item 12:** The Canadian Veterinary Medical Association, in conjunction with their provincial counterparts and producer associations, will undertake a pilot project by the end of 2005 to develop a practice specific guideline on prudent use in a major production animal species and to determine its impact on the producers and on the levels of antibiotic use
Recommendation 13:
Through the Canadian and provincial Veterinary Medical Associations and producer groups, promote prudent antibiotic use through case-based veterinary and producer education programs

Action taken: CVMA Antimicrobial Resistance Committee promotes prudent use guidelines.

Action Item 13: The Canadian Veterinary Medical Association, in conjunction with their provincial counterparts and producer associations, will create expert Working Groups to provide policy guidance and pilot projects to promote prudent antibiotic use

D. Research

Human Health
The Canadian Institutes of Health Research – Institute on Infection and Immunity (CIHR-III) identified antibiotic resistance as a priority funding area starting in fiscal year 2003/04.

In March 2003, CCAR provided a list of research priorities to the CIHR-III, for their review and implementation (see recommendation 14).

ii. Agri-Food and Veterinary Medicine
Consumers and many players in the agricultural community are calling for reductions in antimicrobial use in animals for disease prevention or for feed efficiency and growth promotion. Many non-antimicrobial approaches can potentially be used including improved management practices, feed additives and probiotics. Commercial validation on safety, efficacy and economics of the alternatives is required. Programs in Sweden and Denmark are already in place and could be used as models for Canadian producers.

Recommendation 14:
CIHR Institute for Infection and Immunity (III) should undertake research to:
- Determine the utility and cost benefit of infection prevention measures, screening procedures and alternate therapies as they affect colonization and infection rates
- Better understand the ecology of antibiotic resistance
- Quantify the impact of resistant organisms in non-acute settings
- Quantify the contribution to antibiotic resistance in humans made through the use of antibiotics in agri-food and veterinary medicine

Action Item 14: The Institute for Infection and Immunity (III) will adopt these four strategic research priorities listed above and prepare Requests for Proposals from the research community. III will ensure that antibiotic resistance research carried out under its mandate, is linked to this National Action Plan
REFERENCES


2. Canadian Committee on Antibiotic Resistance, Antimicrobial resistance: A deadly burden no country can afford to ignore. [www.ccar-ccra.org](http://www.ccar-ccra.org) 2002


APPENDICES

A. Report Card on Recommendations from 1997 Consensus Conference on Antimicrobial Resistance
B. List of Currently Active Agri-Food Programs in Antibiotic Resistance
C. List of Currently Active Human Health Care Programs in Antibiotic Resistance
Appendix A

**Canadian Committee on Antibiotic Resistance**

REPORT CARD

On Recommendations for November 1997
Consensus Conference on Antimicrobial Resistance

This document was originally prepared for the participants of the National Policy Conference on Antibiotic Resistance held in Ottawa, October 5-7, 2002. It was updated in March 2004 as an Annex to the National Action Plan to combat antibiotic resistance. It is a subjective opinion of the Canadian Committee on Antibiotic Resistance and is not a scientifically objective evaluation.
**Consensus Conference Recommendations** | **Federal/Provincial Government Response** | **CCAR Response**
--- | --- | ---

**Recommendation 1**

*To reduce overall antimicrobial usage (prescriptions) by 25% within 3 years by focusing on community-acquired respiratory infection.*

**Changing physician behaviour**
- specific guidelines for diagnosis and management of infections
- peer education (practice level or at hospital rounds)
- feedback to physicians on their prescribing practices

**Changing patient behaviour**
- physicians' use of prescription pads for non-antibiotic therapies
- educational materials — videos, information sheets, posters, and material specifically for day-care centres, walk-in clinics, emergency departments

**Vaccines**
- research into the cost-effectiveness of current vaccines in specific situations
- research on the role of universal vaccination in decreasing antimicrobial use
- enhanced utilization of current guidelines for vaccine use
- greater accessibility of vaccine (e.g., for prevention of pneumococcal infections, since at present < 10% of those who should receive the vaccine do so)

**MODERATE SUCCESS**

- By total prescriptions dispensed annually per 1000 population, adjusting for differences in population between 1995 and 2002, oral solid and liquid antimicrobial consumption in Canada has decreased by 14%. Total β-lactam consumption has decreased by 30% during this same period. Difficult to identify only agents used for respiratory tract infections
- While use of older, narrow-spectrum drugs (tetracyclines, solid penicillin, cephalosporin) decreased, use of newer drugs (quinolones, macrolides) has increased slightly over this period.
- Guidelines in place for most key diseases where resistant bacteria are an issue.
- Widespread use of vaccines has not yet been employed to reduce AROs.
- Health Canada’s Best Practices Program was established in 2003 to support the development of optimal guidelines.

**MODERATE SUCCESS**

- There has been a moderate decline in overall antibiotic usage since 1997. This trend began before the Canadian Consensus Conference and cannot be attributed to any particular intervention. However, the rates of decline have increased since 1997. Using the moving annual total, a decrease of 26% was noted between 1997 and December 2002, following the 1997 Consensus Conference.
- Partial success convincing physician community of need to weigh threat of resistance vs. immediate risk to patient.
- CCAR has distributed info kits to all Canadian physicians, veterinarians, and pharmacists. Non-prescription pads are available from the CCAR website.
- CCAR has made presentations to CVMA, CMA, CCMOH, CPHA and many other organizations.
- Numerous CCAR member projects have addressed both physician and patient behaviour.
- CCAR, in an agreement with IMS
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<tr>
<td><strong>Canadian data</strong></td>
<td>drug use strategies.</td>
<td>Canada, provides Canadian oral antibiotic usage data on its Web site. This data will assist in monitoring change over time.</td>
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<td>• formation of a group to collect and coordinate data, and link existing databases</td>
<td>➢ The National Immunization Strategy has been funded by Health Canada but few projects have yet to be implemented.</td>
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<td>• ongoing data collection to take place locally and nationally</td>
<td>➢ Hospital based stewardship or antibiotic committees exist, but these are under-resourced.</td>
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<td><strong>Recommendation 2</strong></td>
<td>FAILURE</td>
<td>N/A</td>
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<td><strong>To improve funding and access to expert resources on antibiotic use in all Canadian health care settings.</strong> This will be accomplished by the creation of expert panels to promote local antibiotic use protocols and to provide case consultations as an adjunct to existing provincial or regional public health networks.</td>
<td>➢ No funding has been made available.</td>
<td>➢ This is beyond the scope of CCAR</td>
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<td></td>
<td>➢ Lack of commitment at national level. Despite best efforts, neither CCAR, nor infectious disease experts within the federal government have been able to make this a political issue.</td>
<td>➢ Some access to experts is available through the CCAR Website and telephone by request only.</td>
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<td>➢ Hospital based stewardship or antibiotic committees exist, but these are under-resourced.</td>
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<td><strong>Recommendation 3</strong></td>
<td>FAILURE</td>
<td>FAILURE</td>
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<td><strong>To establish antibiotic stewardship and antibiotic use teams in all Canadian hospitals by</strong> a) incorporating them into accreditation standards; b) obtaining support from the medical and administrative leadership</td>
<td>➢ No formal surveys have been conducted.</td>
<td>➢ Lobbying of the Canadian Hospital Accreditation Standards Committee has not met with any specific response.</td>
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<td></td>
<td>➢ The Canadian Accreditation Committee moved antibiotic stewardship to a smaller item under pharmaceutical accreditation or infection control.</td>
<td>➢ CCAR attempts to manoeuvre difficult “political” issues through meetings with bureaucrats and politicians.</td>
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<td></td>
<td>➢ Development of specific AMR accreditation standards has not</td>
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<td><strong>Recommendation 4</strong></td>
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<td>To establish antimicrobial usage, monitoring, and intervention programs at the long-term care institutional level.</td>
<td><strong>FAILURE</strong> &lt;ul&gt;&lt;li&gt;No federal action with respect to LTCFs, no guidelines for clinical diagnosis contained in HC publications. &lt;/li&gt;&lt;li&gt;Some local initiatives have commenced in certain regions of the country. &lt;/li&gt;&lt;/ul&gt;</td>
<td><strong>LOW PRIORITY</strong> &lt;ul&gt;&lt;li&gt;This is not seen as a top priority issue at this time. &lt;/li&gt;&lt;li&gt;Projects related to antibiotic use and resistance in native communities are being considered. &lt;/li&gt;&lt;/ul&gt;</td>
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<tr>
<td>Short-term: monitoring of antimicrobial usage</td>
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<td>Intermediate term: monitoring of antimicrobial appropriateness</td>
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<td>Long-term: optimizing antimicrobial use</td>
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**Recommendation 5**

To improve the public's perception about the risks/benefits of microorganisms and risk/benefits of antimicrobial therapy by:

- targeting parents of small children by media campaigns and educational programs;
- establishing a baseline inventory of health promotion projects across the country with regular evaluation of their effects;
- establishing a clearinghouse of information;
- addressing the impact of employee absenteeism policies and daycare attendance policies on the use of antibiotics in children.

**MODERATE SUCCESS**

- Numerous articles have appeared in media with wide circulation (popular magazines, newspapers, radio programs, etc.)
- NIPA awareness campaigns have reached a widespread audience

**MODERATE SUCCESS**

- CCAR has been active in this domain. The CCAR Web site contains current information addressing risk/benefit. Many national and local mass media campaigns have been generated through CCAR and CCAR members.
- Letters to the Editor of most national newspapers have been prepared by CCAR and printed.
- Trade show booth developed for displaying AR information.
- Compendium of activities published in Canadian Journal of Infectious Diseases.
- Web site which is the most comprehensive site on the topic in

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<td><strong>Recommendation 6</strong>&lt;br&gt;<strong>To improve physicians' perceptions about the risk/benefits of microorganisms and the risk/benefits of antimicrobial therapy.</strong>&lt;br&gt;<strong>LIMITED SUCCESS</strong>&lt;br&gt;➢ Awareness of antimicrobial resistance issues has increased in the medical community.&lt;br&gt;➢ The Ontario Ministry of Health and Long Term Care distributed a pamphlet to all physicians outlining the resistance problem and providing contact info for CCAR for further information</td>
<td></td>
<td>Canada acts as clearing house for information on resistance.&lt;br&gt;➢ A national hand hygiene program is under consideration.</td>
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<td>MODERATE SUCCESS&lt;br&gt;➢ Physicians, pharmacists and veterinarians across Canada received CCAR Information Tool Kits, each of which was developed in conjunction with the respective national professional association.&lt;br&gt;➢ Some hospital and/or community level programs (Optimal Antibiotic Use Project, PACCT, Antibiotic Safety Zone, Do Bugs Need Drugs etc) have been very successful in transmitting this message.&lt;br&gt;➢ Numerous presentations made to health care professionals including CMA, CVMA, CCMOH, CPHA and others.&lt;br&gt;➢ Article series in the Canadian Journal of Infectious Diseases began in 2001.&lt;br&gt;➢ State of the art review published Oct 2002 in Canadian Medical Association Journal</td>
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<td>Recommendation 7 <strong>To establish a surveillance system permitting timely acquisition and analysis of local, regional, provincial/territorial and/or national data concerning antimicrobial resistance in human pathogens. The specific organisms and the methodology should be determined by an expert working group.</strong></td>
<td><strong>LIMITED SUCCESS</strong></td>
<td><strong>LIMITED SUCCESS</strong></td>
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<td>➢ A true population-based national surveillance network for AROs (e.g., penicillin resistant <em>S. pneumoniae</em>) from the community does not exist in Canada.</td>
<td>➢ CCAR held a national workshop on surveillance in March 2000 and established a Surveillance Working Group to deal with this issue</td>
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<td>➢ Surveillance in animal agriculture now being implemented by Health Canada through CIPARS</td>
<td>➢ CCAR participated in the process of developing a joint Health Canada - industry partnership ($140,000 industry contribution) to develop a national Web-based surveillance system for specific resistant pathogens (MRSA) within Canadian Nosocomial Infection Surveillance Program.</td>
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<td>➢ While Canadian Hospital Epidemiology Committee/Canadian Nosocomial Infection Surveillance Program, Canadian Institute of Health Information, Canadian Animal Health Institute and Health Canada’s Veterinary Drugs Directorate carry out surveillance of specific organisms, surveillance efforts are at best fragmented, providing an incomplete picture.</td>
<td>➢ IMS Health provides industry data on antibiotic usage rates through the CCAR Web site.</td>
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<td>➢ Recognized difficulties separating the cost of resistant infection from the cost of infection.</td>
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<td>➢ Even basic systems to count patients or track prescription unavailable in some provinces.</td>
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<td>Recommendation 8</td>
<td>MODERATE SUCCESS</td>
<td>LIMITED SUCCESS</td>
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| To establish a system within acute care hospitals to identify at admission and throughout hospitalization, as needed, patients at high risk of harbouring antibiotic-resistant bacteria. These patients should then be screened for the presence of antibiotic-resistant organisms. | ➢ Screening for high risk patients has become an accepted practice at many acute care institutions in Canada.  
➢ No overall standard exists. Systems are implemented by individual hospitals.  
➢ Ontario has established provincial admission screening guidelines, which have been accepted within the province | ➢ CCAR will continue to monitor the situation and take action as required. |
| Recommendation 9                       | MODERATE SUCCESS                          | LIMITED SUCCESS  |
| To create an expert working group to establish national laboratory standards for the detection of antimicrobial-resistant bacteria. These standards will include sample collection and transport, the use of appropriate selective media, identification and antimicrobial susceptibility testing techniques, reporting, and molecular biology techniques used for molecular epidemiology. These standards will include recommendations concerning proficiency testing and training. | ➢ CEQA-AGAR (Microbiology sponsored group that has representation from all provinces and proficiency testing programs in Canada) was created as a result of the 1997 Consensus Conference.  
➢ CEQA-AGAR has distributed laboratory guidelines on the identification, testing, and reporting of MRSA, VRE, PRSP, ESBLs to every clinical | ➢ CCAR supports the efforts of their member CEQA-AGAR |

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## Consensus Conference Recommendations

<table>
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<tr>
<td><strong>To determine the scope of antimicrobial resistance and antimicrobial usage in long-term care facilities through either a pilot study involving selected long-term care facilities or through a sentinel system of long-term care facilities. This pilot would be used to study the epidemiology of antimicrobial resistance, antimicrobial use and other related issues.</strong></td>
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### Federal/Provincial Government Response

- Microbiology lab in Canada, and is developing innovative guidelines for specific bug-drug combinations.
- The degree to which CEQA-AGAR guidelines are implemented varies among provinces. Ontario and BC have good proficiency-testing programs, while some other provinces have none.
- The Canadian Committee on the Standardization of Molecular Methods (CCSMM- a National Microbiology Laboratory sponsored group involving Canadian clinical diagnostic laboratories) is trying to standardize molecular methodologies to ensure quality testing and reporting of results for epidemiologic purposes.
- Funding is desperately required for CCSMM and CEQA-AGAR

### CCAR Response

- **Failure**
  - No movement at all to address AMR in LTCFs

- **Low Priority**
  - This is not seen as a priority at this time.

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<tr>
<td><strong>Recommendation 11</strong>&lt;br&gt;To establish a national surveillance system to monitor antibiotic resistance and antimicrobial use in the agrifood and aquaculture sectors. The exact modalities of the system, the target microorganisms, the methods to be used and the involvement of stakeholders in promoting the judicious use of antimicrobials should be determined by an expert working group.</td>
<td>LIMITED SUCCESS  &lt;ul&gt;&lt;li&gt;Veterinary Drugs Directorate (VDD), Laboratory for Foodborne Zoonoses (LFZ) has an AMR unit with dedicated full-time staff coordinating CIPARS. Research initiatives include:  &lt;ul&gt;&lt;li&gt;a national AMR surveillance system for agri-food/aquaculture sectors  &lt;li&gt;studies examining relationship between antimicrobial use and development of resistance at the farm level.  &lt;/li&gt;&lt;/ul&gt;&lt;/li&gt;&lt;/ul&gt;</td>
<td>LIMITED SUCCESS  &lt;ul&gt;&lt;li&gt;A Tool Kit for veterinarians was developed with CVMA and distributed to Canadian veterinarians in September 2000. Further efforts with the aquaculture industry are being discussed.  &lt;li&gt;CCAR sponsored an ARO track at the CVMA Annual Conference in 2002.  &lt;li&gt;CCAR supports CIPARS activities.  &lt;li&gt;Discussions with CAHI have been initiated on the possible development of optimal use guidelines.  &lt;/li&gt;&lt;/ul&gt;</td>
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<td><strong>Recommendation 12</strong>&lt;br&gt;To make notifiable at the provincial/territorial and national levels certain infections due to antimicrobial-resistant microorganisms. An expert working group should establish the list of microorganisms and the case definitions for the purpose of surveillance.</td>
<td>FAILURE  &lt;ul&gt;&lt;li&gt;The benefit of making certain infections notifiable at the national or provincial levels is being debated.  &lt;li&gt;Antimicrobial resistance has not become part of the equation for notifiable diseases at the national level.  &lt;li&gt;Invasive <em>Strep. pneumoniae</em> declared notifiable in Canada in 2003  &lt;/li&gt;&lt;/ul&gt;</td>
<td>N/A  &lt;ul&gt;&lt;li&gt;This is beyond the scope of CCAR  &lt;li&gt;If data is not available, authorities tend to assume the problem does not exist.  &lt;li&gt;Discussions with Health Canada and several provinces were not fruitful.  &lt;/li&gt;&lt;/ul&gt;</td>
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### Consensus Conference Recommendations

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<td>To mobilize leadership mechanisms to address antimicrobial resistance.</td>
<td>➢ Some provinces (NB, Sask, Alta, BC) have made preliminary motions to make some antimicrobial resistant infections notifiable at the provincial level.</td>
<td>MODERATE SUCCESS</td>
</tr>
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<td></td>
<td>➢ AMR is not a priority for Health Canada and the federal government</td>
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<td>➢ VDD LFZ (in full) have dedicated staff, has initiated the revival of Science and Policy Teams dedicated to the inter-directorate study of antimicrobial resistance (human and animal?)</td>
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<td>➢ BC developed a provincial action plan in 2000</td>
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<td>➢ Alberta developed a provincial action plan in 2004</td>
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### Recommendation 14

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<th>Recommendation 14</th>
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<tr>
<td>To generate, interpret and disseminate information that will support evidence-based approaches to dealing with antimicrobial resistance.</td>
<td>➢ Baseline data still required at national and provincial levels</td>
<td>LIMITED SUCCESS</td>
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<td></td>
<td>➢ Provincial reports (ON, BC, AB)</td>
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| ➢ Significant increase since 1997 in amount of Canadian data available- abstracts, targeted studies, limited surveillance studies etc.  
➢ BC & NB have developed use data in defined daily dose (ddd) format  
➢ CNISP and CIPARS generate annual reports | ➢ CCAR publications in medical journals effective sources of comprehensive information.  
➢ Burden of Illness report completed March 2002 and published Sept 2003 in CDDR to demonstrate social and economic impact.  
➢ CCAR worked with CIHR to identify priorities for research.  
➢ Information from domestic and foreign sources is made available through the extensive links on the CCAR Web site. | |

**Recommendation 15**

To identify structures and key human resources at the care-setting and (local) regional levels that are/will be most responsible for coordinating the care of clients/ patients/consumers affected by antimicrobial-resistant organisms

**LIMITED SUCCESS**

➢ Several provinces have identified resources. No comprehensive, national effort

**MODERATE SUCCESS**

➢ CCAR has considered mechanisms to reach key target audiences in health care settings as well as the general public. Use of most relevant delivery mechanism/media taken into consideration during project development.

➢ Key regional experts made available upon request and solicited where regional expertise is not obvious.

**Recommendation 17**

**LIMITED SUCCESS**

**LIMITED SUCCESS**

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### Consensus Conference Recommendations

To ensure that adequate resources for infection control programs and personnel exist in all Canadian health care settings (including home care, acute care, long-term care, and childhood and adult day-care programs) and to recognize that these programs should be an integral part of the overall program to limit the transmission of antimicrobial resistance.

### Federal/Provincial Government Response

- No recognition that such committees are essential
- Infection control programs have been subject to cuts across Canada.
- 2004 Naylor report identified poor infection control systems as major issue in SARS outbreak
- Article outlining resources for infection control in acute care, including the issues of AROs was published in Canadian Journal of Infection Control by Health Canada
- Even where available, these programs are not widely implemented. They may be perceived as disruptive, ineffective and time-consuming.

### CCAR Response

- CCAR is working with infection control practitioners to develop a series of activities to begin to address this issue. Key target audiences have been identified as school children under the age of 12 and decision makers who influence the provision of human and financial resources for infection control in hospital settings.

### Recommendation 18

To urgently review (within 1 year) infection control guidelines regarding the resources and personnel required in the changing health care environment.

#### LIMITED SUCCESS

- Article outlining resources for infection control in acute care, including the issues of AROs was published in Canadian Journal of Infection Control by Health Canada
- Recommendations from 1997 Consensus Conf. distributed

#### CCAR offered support for SPICE project
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<td><strong>Recommendation 19</strong>&lt;br_To convene a Canadian Coordinating Committee on Antimicrobial Resistance (CCCAR) within 6 months of this conference. This committee, with a broad representation of stakeholders, will meet twice a year and will take leadership and responsibility for ensuring effective implementation of recommendations by the stakeholder groups.**</td>
<td><strong>MODERATE SUCCESS</strong>&lt;br&gt;» CCAR has assumed prescribed responsibilities&lt;br&gt;» Federal funding continues to be minimal ($250,000/yr) and subject to Health Canada annual budget allocations.</td>
<td><strong>SUCCESS</strong>&lt;br&gt;» CCAR has been active for six years and has assumed many of its prescribed responsibilities although it has not been able to ensure implementation of all recommendations.</td>
</tr>
<tr>
<td><strong>Recommendation 20</strong>&lt;br_To provide CCCAR with a full-time secretariat (financed chair).**</td>
<td><strong>SUCCESS</strong>&lt;br&gt;» HC continues to provide $250,000/yr until March 2004. Renewal of funding was successful for a three year term as of April 2004.</td>
<td><strong>SUCCESS</strong>&lt;br&gt;» Executive Director selected in November 1999</td>
</tr>
<tr>
<td><strong>Recommendation 21</strong>&lt;br_To subject each recommendation of this consensus conference to periodic review and evaluation to examine: i. the stage of implementation and its effectiveness in mobilizing leadership mechanisms to address antimicrobial resistance issues; ii. its effectiveness in terms of measurable outcome goal achievements.**</td>
<td><strong>LIMITED SUCCESS</strong>&lt;br&gt;» Consensus Conference recommendations reviewed during initial development of CCAR.&lt;br&gt;» No systematic review of implementation and effectiveness has been undertaken.</td>
<td><strong>LIMITED SUCCESS</strong>&lt;br&gt;» Priority-setting carried out at Annual General Meeting and quarterly Executive Meetings. The CCAR Executive identified key priorities for 2001/02. These include continued focus on optimal antibiotic use and expanded activities in surveillance and infection prevention/control. Each project should include evaluation mechanisms.&lt;br&gt;» Report card published in October 2002 and updated in March 2004.</td>
</tr>
<tr>
<td>Consensus Conference Recommendations</td>
<td>Federal/Provincial Government Response</td>
<td>CCAR Response</td>
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<tr>
<td>----------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td><strong>Recommendation 22</strong>&lt;br&gt;To develop a strategy to ensure that adequate resources are allocated for the implementation of the overall recommendations</td>
<td><strong>FAILURE</strong>&lt;br&gt;- Inability to establish antimicrobial resistance as national priority continues to forestall widespread action.</td>
<td><strong>LIMITED SUCCESS</strong>&lt;br&gt;- While the CCAR Executive reviews the budget and allocates administrative resources, funding is inadequate to permit comprehensive, continuing, widespread action on any front. &lt;br&gt;- Funding from industry for some specific initiatives has been encouraging but is declining as sales of antibiotics decreases. &lt;br&gt;- Provincial fiscal commitments have been very limited.</td>
</tr>
<tr>
<td><strong>Recommendation 23</strong>&lt;br&gt;To explore regional funding mechanisms to ensure the availability of needed experts (infection control, infectious diseases, medical microbiologists) now and in the future.</td>
<td><strong>FAILURE</strong>&lt;br&gt;- No action taken</td>
<td><strong>LIMITED SUCCESS</strong>&lt;br&gt;- Working with representatives from BC, AB and ON, some provincial programs have been initiated.</td>
</tr>
<tr>
<td><strong>Recommendation 24</strong>&lt;br&gt;To incorporate consumers (targets) and local issues in the development of communications plans for each recommendation. These plans will include needs assessment and identified barriers. Consumers may help to identify positive factors.</td>
<td><strong>FAILURE</strong>&lt;br&gt;- No action taken</td>
<td><strong>MODERATE SUCCESS</strong>&lt;br&gt;- For those recommendations it has sought to address, CCAR has worked extensively with the media to develop articles for national and regional newspapers as well as radio and television programming related to antibiotic resistance.</td>
</tr>
</tbody>
</table>
### Consensus Conference Recommendations

<table>
<thead>
<tr>
<th>Federal/Provincial Government Response</th>
<th>CCAR Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Working with Do Bugs Need Drugs, a successful proposal was developed to deal more effectively with the Chinese community.</td>
<td>MODERATE SUCCESS</td>
</tr>
<tr>
<td>➢ No action taken</td>
<td>LIMITED SUCCESS</td>
</tr>
<tr>
<td>➢ No action taken</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 25</th>
<th>FAILURE</th>
<th>FAILURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>To develop a communication strategy for each recommendation:</td>
<td>➢ No action taken</td>
<td>➢ No action taken</td>
</tr>
<tr>
<td>• Who will organize?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Who are the targets?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What resources are necessary (existing vs. new)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What communications modality will be used?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What are the time lines?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• How will the effect of the communication strategy be evaluated?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendation 26</th>
<th>FAILURE</th>
<th>LIMITED SUCCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>To prioritize each recommendation based on the underlying evidence and importance to antimicrobial resistance and usage.</td>
<td>➢ No action taken</td>
<td>➢ 1997 recommendations were very ambitious. It is impossible to move forward on all fronts, so priority-setting becomes vital.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Although the CCAR Executive reviews the activity plan on a continuing basis to determine priorities and potential funding sources, some items are prioritized merely because they are achievable, rather than because they are of primary importance.</td>
</tr>
</tbody>
</table>

This document is a subjective opinion of the Canadian Committee on Antibiotic Resistance and is not a scientifically objective evaluation.
<table>
<thead>
<tr>
<th>Consensus Conference Recommendations</th>
<th>Federal/Provincial Government Response</th>
<th>CCAR Response</th>
</tr>
</thead>
</table>
| **Recommendation 27**  
To use a communications package that will promote behaviour change in usable, practical, attractive, achievable steps. Ongoing evaluation of the communications strategy will permit modification and improvement. | ➢ No action taken | See # 25. |
Appendix B

List of Currently Active Agri-Food Programs in Antibiotic Resistance

Prepared by the Canadian Committee on Antibiotic Resistance
January 2004
## AGRICULTURE PROFILES

<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta Beef Producers (formerly Cattle Commission) (ACC)</td>
<td>Control and Prevention X</td>
</tr>
<tr>
<td>BC Ministry of Agriculture, Food and Fish-Health Management &amp; Regulatory Branch</td>
<td>X  X  X</td>
</tr>
<tr>
<td>Canadian Animal Health Institute (CAHI)</td>
<td>X</td>
</tr>
<tr>
<td>Canadian Cattlemen’s Association (CCA)</td>
<td>X  X  X</td>
</tr>
<tr>
<td>Canadian Food Inspection Agency (CFIA)</td>
<td>X  X  X</td>
</tr>
<tr>
<td>Centre for Coastal Health (CCH)</td>
<td>X  X</td>
</tr>
<tr>
<td>Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)</td>
<td>X</td>
</tr>
<tr>
<td>Canadian Pork Council (CPC)</td>
<td>X  X</td>
</tr>
<tr>
<td>Canadian Veterinary Medical Association (CVMA)</td>
<td>X  X</td>
</tr>
<tr>
<td><strong>Health Canada – Veterinary Drugs Directorate</strong> **</td>
<td>X  X  X</td>
</tr>
<tr>
<td>Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec (MAPAQ)</td>
<td>X  X</td>
</tr>
<tr>
<td>Ontario Ministry of Agriculture and Food (OMAF)</td>
<td>X  X  X</td>
</tr>
<tr>
<td>Poultry Industry Council</td>
<td>X  X  X</td>
</tr>
<tr>
<td>University of Guelph – Animal Health Lab</td>
<td>X  X  X</td>
</tr>
<tr>
<td>University of Guelph – Laboratory Services Division</td>
<td>X</td>
</tr>
</tbody>
</table>

**Health Canada, Veterinary Drugs Directorate profile – not yet complete**
Alberta Beef Producers  
(formerly Alberta Cattle Commission - ACC)

Gary R. Sargent, P.Ag., General Manager  
Alberta Beef Producers  
216 - 6715 - 8 Street N.E.  
Calgary, Alberta, Canada T2E 7H7  
Telephone: 403-275-4400  
Fax 403-274-0007  
Website: www.albertabeef.org  
garys@albertabeef.org

Type of Organization
• Provincial association

Description
Represents 35,000 beef cattle producers.

Objectives:
• To enhance proactive issues management in relation to the beef industry, the public and the government.
• To influence and fund national beef organizations with similar goals.
• To expand Alberta beef sales in targeted markets.
• To enhance product quality to meet consumer needs.
• To enhance our strategic alliances within the beef industry and maintain a credible, broad-based beef organization.

Activities
• Produce newsletter entitled *Grass Routes*, which acts to inform industry on issues of importance such as antimicrobial resistance.
• Manage the Canada Alberta Beef Industry Development Fund that is in part used to fund research on antibiotic resistance in beef cattle and its corresponding effects on humans.

BC Ministry of Agriculture, Food and Fish  
Health Management & Regulatory Branch

Dr. Merv Wetzstein  
Manager/ Assistant Chief Veterinarian  
Health Management & Regulation  
BCMAFF  
1767 Angus Campbell Road  
Abbotsford, British Columbia   V3G 2M3  
Tel.: (604) 556-3013  
Fax.: (604) 556-3015  
E-mail: merv.wetzstein@gems9.gov.bc.ca

Type of Organization/Project
• Provincial government

Description
Engaged in agricultural issues impacting animals/sustainability of agriculture. Involved with health management, regulation and disease investigation.

Activities
• Work on AMR surveillance in poultry.
• Direct seminars about responsible antibiotic use for producers and veterinarians.
• Developing database on antimicrobial resistance in broiler production using the NARMS system that will contain information on:
  • Antibiotic use in animal feed.
  • License outlets that dispense non-prescription veterinary drugs.
  • License feed mills that produce medicated feed.
• Provided the BCMAFF will get the funding they intend to develop a database for all species and continue to monitor AMR following the development of the base line information.
• Will be incorporating this database with Health Canada.
• Distribute newsletters describing current issues.
• Completed sample collection in cooperation with Health Canada looking at antibiotic use in swine and resistance factors in swines to farm workers.
Canadian Animal Health Institute

Ms. Jean Szkotnicki, President
160 Research Lane, Suite 102
Guelph, Ontario  N1G 5B2
Tel.: (519) 763-7777  Fax.: (519) 763-7407
E-mail: cahi@cahi-icsa.ca
Web-Site: www.cahi-icsa.ca

Type of Organization/Project
- National association

Description
The Canadian Animal Health Institute (CAHI) is the trade association representing the developers, manufacturers and distributors of animal health products in Canada. Members have animal labelled products, approved by Health Canada in the case of pharmaceuticals and by the Canadian Food Inspection Agency in the case of vaccines and feed additives. All animal pesticides are licensed by the Pest Management Regulatory Agency. These products are used to keep animals healthy, to help ensure safe food and to support the competitiveness of Canadian farmers.

Activities
- Developed information kits that were sent to over 300 organizations across Canada. These kits were also sent to livestock commodity and veterinary associations. Kits contained background information on antimicrobial resistance as it relates antimicrobial use in animals.
- Completed consumer focus groups in order to determine their attitudes on antimicrobial resistance
- Completed media training within the organization, and with livestock and veterinarian associations
- Developed informative web site, which includes commonly asked questions regarding antimicrobial resistance
- Developed newsletter entitled Inforum, which includes many articles that deal with issue of antimicrobial resistance
- Member of CCAR

Canadian Cattlemen’s Association (CCA)

Mr. Rob McNabb, P.Ag.
Canadian Cattlemen’s Association
#310, 6715 – 8th St. NE
Calgary AB T2E 7H7
Tel.: (403) 275-8558  Fax.: (403) 274-5686
Web-Site: www.cattle.ca/
Email: mcnabbr@cattle.ca

Type of Organization
- National association

Description
Represents Canada’s 90,000+ beef cattle producers. The CCA is involved in a wide range of issues that are of concern to Canadian beef producers including animal health, animal care, environment, foreign trade, food safety, quality and marketing.

Activities
- The organization has a representative on the National Steering Committee on Antimicrobial Resistance (initiated by Health Canada):
  - Representative reports back to the organization about any important issues discussed by the committee
  - When important issues are discussed, CCA communicates these issues to Canadian beef producers
- Initiated the Canadian Cattlemen: Quality Starts Here Verified Beef Production is HACCP-based and is a participant in the Canadian On Farm Food Safety Program with 21 other primary production commodity groups
- Promoting the QSH Program and making it available to all beef producers
- Good Production Practices for specific sectors of the industry have been a primary output. These GPPs address significant issues such as the responsible use of pharmaceuticals and the minimizing of food borne pathogens at the farm level.
- Web site contains information on Good Production Practices and current issues
**Canadian Food Inspection Agency (CFIA)**

Annie Savoie  
59 Camelot Drive  
Nepean, Ontario   K1A 0Y9  
Tel.: (613) 225-2342  Fax.: (613) 228-6614  
Agency Information: 1-800-442-2342  
Web-Site: www.cfia-acia.agr.ca  
Email savoiea@inspection.gc.ca

**Type of Organization/Project**  
- Federal government

**Description**  
The mandate of the CFIA is to enhance the effectiveness and efficiency of federal inspection and related services for food and animal & plant health. The CFIA, under the authority of the federal Feeds Act, monitors the use of feed-additive drugs primarily through facility inspection, label inspection and feed sampling & testing programs at feed mills and farms in Canada. These programs seek to verify that the use of medications complies with conditions of each drug approval or with exceptions provided in the federal Food and Drug Regulations and the Feeds Regulations. As part of the Feeds Regulations, detailed conditions and instructions respecting the use of feed-additives medications are set out in the Compendium of Medicating Ingredients Brochures (CMIB), maintained and published by the CFIA.

**Activities**  
- Participates in various committees involved in issues surrounding antimicrobial resistance such as risk assessment and surveillance  
- Currently consulting with stakeholders regarding proposed Regulations respecting the Making of Livestock Feeds that were published in the Canada Gazette 1 on February 5, 2000  
- Conducts feed mill and on farm inspections to assess procedures used in the manufacture of medicated feeds  
- Routine monitoring livestock feed to verify that anti-imicrobial agents are properly mixed  
- Reviews feed labels to ensure that appropriate mixing and use statements are in compliance with the CMIB and the Feeds Regulations  
- Reviews antimicrobial resistance profile for microbials (direct fed microbials and silage inoculants) used in livestock feeds  
- Member of CCAR

**Centre for Coastal Health (CCH)**

Dr. Craig Stephen, Director  
Centre for Coastal Health  
900 5th Street  
Nanaimo, BC.  V9R 5S5  
Tel.: (250) 741-6366  Fax.: (250) 740-6482  
E-mail: cch@mala.bc.ca  
Web-Site: www.mala.bc.ca/www/CCH

**Type of Organization**  
- Academia

**Description**  
Network of academic organizations and independent investigators including: Health Care and Epidemiology (University of British Columbia), Western College of Veterinary Medicine (University of Saskatchewan), Ontario Veterinary College (University of Guelph), Malaspina University-College

**Objectives:**  
- To examine the interactions of human, animal and environmental health  
- To provide useful information needed to solve or manage environmental health problems  
- To provide an independent evaluation of health effects of human activities on human and animal populations

**Activities**  
- Established a national interdisciplinary research unit called “The Animal Determinants of Emerging Disease Unit”  
- Evaluated opportunities to track animal antimicrobial use and patterns of zoonotic pathogen sensitivity in British Columbia  
- Developing a system for recording medicated feed sales in British Columbia  
- Participating in a pilot study of antimicrobial agents on farmed salmon after processing  
- Reviewed environmental and public health risks of antimicrobial use in salmon farms  
- Developing systems to use observations of animal management and health as indicators of emerging environmental health risks to people
Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

Dr. Rebecca Irwin or Ms. Kathryn Dore
160 Research Lane, Suite 103
Phone/Fax: (519) 826-2183 (Rebecca) or (519) 826-2213 (Kathryn)
Email: Rebecca_irwin@hc-sc.gc.ca or kathryn_dore@hc-sc.gc.ca

Type of organization
• National association

Description
Health Canada has been working with federal and provincial counterparts and other interested stakeholders and partners to develop the Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS). This program has been under development the last few years. Several demonstration and research projects in both the human and veterinary sectors have been launched. The first annual CIPARS report will be released in early 2004 and will provide a detailed description of the methodology employed by CIPARS, data acquired to date, and interpretation of the results.

Activities
• Correlation research on farms between antimicrobial use and the presence of resistance
• Antimicrobial use monitoring (human and animal)
• Correlation research examining presence of antimicrobial resistant Campylobacter spp. in retail chicken, and human campylobacteriosis in defined health unit areas in Ontario
• Risk assessment and policy support
• Microbiological methods evaluation to enhance isolate recovery from surveillance samples
• Evaluating susceptibility testing methods
• Surveillance program design and evaluation
• Surveillance data analyse and reporting
• Active surveillance sampling at farm, abattoir and retail levels
• Passive Salmonella surveillance data from clinical human and animal cases
• Education and communication on antimicrobial resistance issues to stakeholders

Canadian Pork Council (CPC)

Catherine Scovil
Executive Associate
Canadian Pork Council
75 Albert Street, Suite 1101
Ottawa, Ontario K1P 5E7
Tel.: (613) 236-9239 Fax.: (613) 236-6658
Web-Site: www.canpork.ca/scovil@cpc-ccp.com

Type of organization
• National association

Description
To provide a leadership role in a concerted effort involving all levels of industry and government toward a common understanding and achieving a dynamic and prosperous pork industry in Canada.

Activities
• Established Working Group on Antimicrobial Resistance with experts, government and pork industry representatives. Results: Report was written focusing on the nature, stakes and solutions of Antimicrobial Resistance in the Canadian pork industry. 5 actions items and 16 research priorities were identified and have been endorsed by key stakeholders
• Revising the Canadian Quality Assurance (CQA) Program™, which focuses on on-farm food safety and includes antimicrobial resistance
• Runs an on-farm food safety program based on HACCP which includes addressing concerns related to antimicrobial resistance
• CPC participated in a Health Canada consultation dealing with follow-up to the recommendations of the Advisory Committee on Animal Uses of Antimicrobials and Impact on Resistance and Human Health. The CPC was represented on the Advisory Committee.
• Publishing newsletter that describes current issues affecting industry
• New program materials to be released including prudent use guidelines developed by the CVMA
Suzanne Lavictoire, Program Director
Janice Mercer, Manager, Communications
339 Booth Street
Ottawa, Ontario K1R 7K1
Tel.: (613) 236-1162 Ext. 18
Fax.: (613) 236-9681
Web-Sites: www.cvma-acmv.org
www.canadianveterinarians.net
wwwanimalhealthcare.ca
Emails: slavictoire@cvma-acmv.org
jmercer@cvma-acmv.org

Type of Organization/Project
• National association

Description
The CVMA is the national body representing and serving the interests of the veterinary profession in Canada. The association is committed to excellence within the profession and to the well being of animals. It promotes public awareness of the contribution of animals and veterinarians to society. The CVMA is involved with many national issues and considers antimicrobial resistance one of its top priorities.

Activities
• Developed a set of guidelines on the prudent use of antibiotics
• Developed a position on antimicrobial use in animals in which it:
  • addressed the potential implications of antimicrobial resistance
  • recognized the prudent use of antimicrobials in veterinary medicine and for agriculture
• Developed an information web-site
• Publishes scientific journals
• Produced special information kits in yr 2000 (partnered with CCAR) to update veterinarians on antimicrobial resistance and to assist them in educating their clients
• The CVMA, with the financial support of the Government of Canada, is currently developing species/commodity specific antimicrobial prudent use guidelines for beef cattle, dairy cattle, swine and poultry
• Member of CCAR

Marie Nadeau, dmv, M.Sc.
Laboratoire d’expertise en pathologie animale
2700, rue Einstein, C, RC.243
Sainte-Foy (Québec) G1P 3W8
Tel.: (418) 643-6140, poste 206
Fax: (418) 644-2644
marie.nadeau@agr.gouv.qc.ca
www.agr.gouv.qc.ca

Type of Organization
• Provincial government

Description
This organization monitors the emergence of bacterial resistance to antimicrobial agents in animals, food and fish from fish farms. It also monitors the use of antimicrobial agents for therapeutic purposes and as additives in animal feed. Information on bacterial resistance is disseminated periodically and/or quickly to the veterinary or the public health community. Recommendations are made regarding antimicrobial chemotherapy in veterinary medicine in order to ensure ATMs are used wisely.

Activities
• Collect and analyze the data on ATM use
• Compare the resistance profiles of bacteria isolated from animals and humans as well as in food by using similar methods
• Select bacterial isolates so that they are representative of certain infections that affect the populations studied and of the various regions of Québec
• Monitor (actively and passively) bacterial species according to the animal species selected, while including pathogenic bacteria as well as those used as indicators in healthy animals
• Estimate and compare the various levels of resistance in animals, humans and food; estimate the extent of the transmission of resistance from animals to humans

Categories
Optimal Use
Prevention & Control
Surveillance
**Ontario Ministry of Agriculture and Food**

Kim C. Klotins, DVM  
Antibiotic Resistance Specialist  
Livestock Technology Branch  
3rd Floor NE, 1 Stone Road West  
Guelph, Ontario N1G 4Y2  
Tel: (519) 826-3215  Fax: (519) 826-3254  
Web-Site: www.gov.on.ca/OMAFRA/  
kim.klotins@omaf.gov.on.ca

**Type of Organization/Project**  
- Provincial government

**Description**  
OMAF has activities related to antimicrobial resistance in the Agriculture and Rural Division (Livestock Technology) of the Ministry to facilitate education, surveillance and research on issues relating to antimicrobial use in agriculture and antimicrobial resistance development.

**Activities**  
- Developed an Antimicrobial Resistance Resource Kit, an education extension tool. This tool contains a video, CD, overheads of a PowerPoint presentation, resources, brochures, antimicrobial prudent use guidelines and Factsheets.
- Antimicrobial resistance surveillance program to describe trends in resistance in specific bacterial species from specific animal species to be used by Ontario veterinarians and producers (in conjunction with the OMAF Veterinary Science group and the University of Guelph). Information from January 2001 onward will be available for analysis.
- Current investigation, entitled “Difference in Salmonella prevalence, drug use patterns and antimicrobial resistance in Salmonella between finishing pig operations that use a liquid feeding system versus a dry feeding system”. Final report is due March 31, 2004.
- A member of Health Canada’s National Steering Committee on Monitoring Antimicrobial Use in Agriculture and Veterinary Medicine.
- A stakeholder with the Veterinary Drugs Directorate initiative to implement the 38 recommendations of the report, entitled “Uses of Antimicrobials in Food Animals in Canada: Impact on Resistance and Human Health”.

**Categories**  
- Control & Prevention  
- Optimal Use  
- Surveillance

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**Poultry Industry Council**

Mr. Dave Nodwell  
RR#2  
483 Arkell Road  
Guelph, Ontario N1H 6H8  
Tel.: (519) 837-0284  
Fax.: (519) 837-3584  
E-mail: d.nodwell@poultryindustry council.ca  
www.poultryindustry council.ca

**Type of Organization/Project**  
- Private/non-profit

**Description**  
The Poultry Industry Council provides a focal point though which the industry itself can direct the human, physical and fiscal resources necessary to control its own destiny. It encourages, provides advice and underwrites research designed to respond to poultry industry priorities. To ensure the provision of adequate life-long learning opportunities for those who wish to specialize in poultry research or in poultry production, processing or marketing. To protect and prudently invest the financial resources of the Council for the future security and prosperity of the poultry industry for the ultimate benefit of all Canadians.

**Activities**  
- Formed a committee consisting of the feed industry, poultry veterinarians, and the poultry industry to formulate strategies to deal with issues such as antimicrobial resistance. The Committee has discussed prudent use, alternative products, and alternative management.
- Funding research on antimicrobial resistance.
- Developing database containing information on medications being used in the poultry industry. Database will be available on the organization’s web site.

**Categories**  
- Control & Prevention  
- Optimal Use  
- Surveillance
University of Guelph:
Animal Health Lab

Dr. Beverly McEwen
Pathologist/Surveillance Specialist
University of Guelph
P.O. Box 3612
Guelph, Ontario  N1H 6R8
Tel.:  (519) 824-4120 ext 54537
Fax.: (519) 821-8072
E-mail: bmcewen@lsd.uoguelph.ca
Web-Site: www.uoguelph.ca/ahl

Type of Organization/Project
• Academia

Description
The Animal Health Laboratory (AHL) unit of the Laboratory Services Division complements the research, regulatory, and analytical testing carried out by the Division. Staff provide carefully monitored, high-quality analysis involving over 400 individual tests in our specialty areas of anatomic pathology, avian virology, bacteriology, clinical pathology, mammalian virology, molecular biology, mycoplasmology, immunology/serology, parasitology, and toxicology. Animal disease surveillance is also a unique and important function of the AHL. Veterinary diagnostic lab involved in the surveillance of antimicrobial resistance.

Activities
• Completing two year research project on antimicrobial resistance in cattle, swine and chickens. Creating database to summarize results. Database will be integrated with Health Canada’s database.
• Display posters indicating the research being conducted and the results of this research. Posters also posted at international conference for veterinarians (ISVEE).
• Publish newsletters targeted at veterinarians and producer groups. Newsletters contain information on new research being conducted.
• Publish research results in peer-reviewed journals.
• Perform routine diagnostic – monitoring antimicrobial resistance worldwide on a variety of species including livestock, poultry, exotic, fur-bearing and companion animals.
Appendix C

List of Currently Active Human Health Care Programs in Antibiotic Resistance

Prepared by the Canadian Committee on Antibiotic Resistance
January 2004
## HEALTH CARE PROFILES

<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>Control and Prevention</th>
<th>Optimal Use</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta Health and Wellness</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Association of Medical Microbiology and Infectious Disease Canada</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Antimicrobial Resistance Committee Quebec</td>
<td>X</td>
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<tr>
<td>Antibiotic Resistance Education Program British Columbia</td>
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<tr>
<td>Antibiotic Safety Zone</td>
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<tr>
<td>BC Center for Disease Control</td>
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<tr>
<td>Canadian Bacterial Surveillance Network</td>
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<tr>
<td>Canadian Immunization Awareness Program</td>
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<td>Canadian Medical Association</td>
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<td>Canadian Pharmacists Association</td>
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<td>Communimed</td>
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<td></td>
<td>X</td>
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<tr>
<td>Do Bugs Need Drugs?</td>
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<td>Focus Technologies (formerly MRL)</td>
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<td><strong>Health Canada, Population and Public Health Branch</strong></td>
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<td>Manitoba Antimicrobial Research Laboratories (MARL)</td>
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<td>National Information Program on Antibiotics (NIPA)</td>
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<td>Newfoundland and Labrador Antibiotic Network (NLAN)</td>
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<td>Partners for Appropriate Anti-infective Community Therapy</td>
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<td>Pediatric Investigators Collaborative Network on Infections in Canada</td>
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<td>Quality Management Program – Laboratory Services</td>
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**Health Canada, Population and Public Health Branch profile – not yet complete**
Type of Organization/Project
- Provincial government

Activities
- To date, Alberta Health and Wellness have not had a provincial initiative designed to combat antibiotic resistance. In March 2004, a consultation process was completed to create a framework for a provincial strategy to prevent and manage antibiotic resistance. The framework provides recommended strategies to improve the prevention and control of antimicrobial resistance in Alberta. Further stakeholder consultation is expected over the coming months.
- Member of CCAR

Association of Medical Microbiology and Infectious Disease Canada
(formerly CIDS)

Mr. Richard McCoy
Executive Director
2197 Riverside Drive, Suite 504
Ottawa, Ontario K1H 7X3
Tel.: (613) 260-3233  Fax.: (613) 260-3235
E-mail: cids@magma.ca
Web-Site: www.cids.medical.org

Type of Organization/Project
- National association

Description
This organization is dedicated to the promotion of excellence in the prevention, diagnosis and management of human infectious diseases. It contributes to the health of people at risk of, or affected by infectious diseases. The organization promotes, facilitates and supports research and education in infectious diseases.

Activities
- Hosted the Canadian consensus conference "Controlling Antimicrobial Resistance: An Integrated Action Plan for Canadians" which was held in Montreal, May 28-30, 1997
- Established CCAR (Canadian Committee on Antibiotic Resistance); is a permanent member
- Initiated and maintains InfectNet (www.infectnet.com) containing information on important issues in infectious diseases
- Partner in National Information Program on Antibiotics (NIPA)
- Produce "Canadian Journal of Infectious Diseases" which contains information on antimicrobial resistance and is mailed out to infectious diseases physicians, family practitioners and institutions
- Published a full supplement entitled “Antimicrobial stewardship in Canadian health care institutions “ in September 1998 (Vol 9; Supplement C )
- Hosts the AMMI/CHICA Conference, April 29th – May 2nd, 2004, Calgary, Alberta
Antimicrobial Resistance Committee Quebec
GRAM: Group Contre la Résistance aux Antimicrobiens

Dr. Karl Weiss, MD, MSc, FRCPC
Clinical Associate Professor
Département De Microbiologie-Infectiologie
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Montréal, Quebec  H1T 2M4
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Fax.: (514) 252-389
E-mail: weisscan@aol.com

Type of Organisation/Project
• Collaboration of health care organisations and private sector.

Description
The Association of Medical Microbiologists and infectious disease specialists of Quebec (AMMIQ - Association des Médecins Microbiologistes-Infectiologues du Québec) is made up of sub-committees:
• Laboratory surveillance
• Planning and implementation
• Antibiotic use
The Committee is a member of CCAR and consists of representatives of various health organisations, the pharmaceutical industry, and the ministry of health.

Objective:
• To put in place mechanisms of surveillance and control of antibiotic resistance

Activities
• Laboratory surveillance
• Completed mail-outs to pharmacists
• Actively involved with media including TV spots, newspaper articles and press conferences
• Future communications objectives include development of a web site, and more emphasis on the message “don’t be afraid of antibiotics but use them wisely”

Antibiotic Resistance Education Program
British Columbia

Dr. David Speert
Room 377, Research Centre
950 West 28th Avenue
Vancouver, BC, V5Z 4H4
Tel.: (604) 875-2438
E-mail: dspeert@cw.bc.ca

Type of Organisation/Project
• Education project

Description
Health education initiative program, started in 1997, designed to reduce risks associated with the emergence of antibiotic-resistance bacteria. This program is operated in collaboration with University of British Columbia Department of Family Practice and the Institute of Health Promotion and Research. Funding has been provided by the Vancouver Foundation, the BC’s Children’s Hospital Foundation and the Peter Wall Institute or Advanced Studies.

Results: Evaluation showed that 88% of physicians who returned the forms used some of the resource material. 60% of physicians believed that prescribing of antibiotics had decreased.

Objective:
• To promote judicious prescribing practices in the treatment of upper respiratory infections in pre-school aged children.

Activities
• Completed mail survey of 600 physicians to assess prescribing practices
• Designed and distributed an education resource package to 5,000 physicians
• Introduced media campaign geared at reinforcing key messages
• Created networks that incorporate new antibiotic resistance knowledge in training programs for medical students. Evaluated networks using a variety of quantitative and qualitative approaches, including feedback forms, a follow-up mail survey, and a review of government prescribing data.
**Antibiotic Safety Zone**

Dr. Ross Pennie  
Professor, McMaster University Faculty of Health Sciences  
c/o Microbiology Laboratory  
Brantford General Hospital  
200 Terrace Hill Street  
Brantford, Ontario, Canada N3R 1G9  
Telephone: 519-751-5544 ext. 4351  
Fax: 519-752-7809  
Email (university): rpennie@mcmaster.ca  
Email (hospital): penro@bchsys.org  
Website: http://www.fhs.mcmaster.ca/path/directory/fac/pennie.htm

**Type of Organization/Project**
- Web site

**Description**
- Educational tool to guide communities and physicians in the responsible use of antibiotics for children and adults with coughs, colds, and earaches

**Activities**
- The “Antibiotic Safety Zone”, denoted by a distinctive logo, is a collective pledge to use antibiotics in accordance with a set of principles aimed at decreasing unnecessary antibiotic prescriptions
- These principles are designed for households, daycare centres and medical offices and serve as a practical guide for physicians, patients, families and daycare centres
- Private web site contains “Antibiotic Safety Zone” posters and information sheets for medical offices, daycare centre and patients. Posters and materials are available upon request
- Dr. Pennie lectures on this topic (“Welcome to the Antibiotic Safety Zone”) to community groups all over Ontario. He also works with local health units, groups of nurses, doctors and daycare providers

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**BC Center for Disease Control**

David M. Patrick, MD, FRCPC, MHSc  
Associate Professor, Health Care and Epidemiology  
University of British Columbia  
and Director, Communicable Disease Epidemiology  
British Columbia Centre for Disease Control  
655 West 12 Ave  
Vancouver BC V5Z 4R4 Canada  
Phone: 604-660-3199 Fax: 604-660-0197  
www.bccdc.org  
Email: david.patrick@bccdc.ca

**Type of Organization/Project**
- Provincial reporting centre for reportable cases of communicable disease

**Description**
The BCCDC is a provincial agency managed and governed by the Provincial Health Services Authority (PHSA). It is a centre for the prevention, detection and control of communicable diseases and is a member of CCAR.

**Activities**
- BCCDC and UBC are actively tracking population based antimicrobial consumption with the PharmaNet program
- BCCDC and local microbiology labs are currently assessing quality of available information on invasive pneumococcal isolates. Will be liaising with National Strep Centre in Edmonton on this
- BC-Chapter Canadian Association of Medical Microbiologists is coordinating laboratory based surveillance of VRE and MRSA
Canadian Bacterial Surveillance Network (CBSN)

Mr. Donald E. Low, M.D., FRCPC
Microbiologist-in-Chief,
Department of Microbiology,
Infectious Diseases
Mount Sinai Hospital, Room 1485
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Toronto, Ontario M5G 1X5
Tel.: (416) 586-4435 Fax.: (416) 586-8746
Email: dlow@mtsinai.on.ca
http://microbiology.mtsinai.on.ca/research/cbsn.html

OR Dr. Allison McGeer, M.D., FRCPC
Microbiologist, Infectious Disease Consultant
Same address as above
Tel.: (416) 586-3118 Fax.: (416) 586-3140
Email: amcgeer@mtsinai.on.ca

Type of Organization/Project
- Surveillance network

Description
CBSN is a subgroup of the Canadian Bacterial Diseases Network, (Canada-wide consortium of researchers whose work focuses on bacterial disease) which is one of the 15 federally funded networks of Centres of Excellence. The surveillance network is comprised of a group of more than 100 clinical laboratories across Canada who voluntarily share data and bacterial isolates for microbiological study.

Objective:
- To monitor the prevalence, mechanisms and epidemiology of antibiotic resistance in Canada

Activities
- Identify problems of emerging bacterial resistance and changing epidemiology and ensure that health care providers have necessary data for various management strategies.
- Toronto Invasive Bacterial Diseases Network
  - Since January, 1995, has performed surveillance for a variety of bacterial pathogens in Metro Toronto/Peel Region
- Ontario Group A Streptococcal Study.
- Performed surveillance for invasive GAS disease in Ontario since January 1992

Canadian Immunization Awareness Program

Ms Mary Appleton
Sr. Manager
1565 Carling Ave suite 400
Ottawa, Ontario K1Z 8R1
Tel.: (613) 725-3769 ext 139
Fax.: (613) 725-9826
Email: mappleton@cpha.ca or immunize@cpha.ca

Type of Organization/Project:
- Coalition of national organizations

Coalition members: Canadian Infectious Disease Society, Canadian Institute of Child Health, Canadian Infectious Disease Society, Canadian Medical Association, Canadian Nurses Association, Canadian Nursing Coalition for Immunization, Canadian Paediatric Society, Canadian, Pharmacists Association, Canadian Public Health Association, College of Family, Physicians of Canada, Council of Chief Medical Officers of Health, Health Canada

Sponsor members: Aventis Pasteur Limited, GlaxoSmithKline Limited, Merck Frosst Canada Limited, Shire Biologics Incorporated

Description
Objective: To contribute to the control of vaccine-preventable diseases in Canada by increasing awareness of immunization via education, promotion, advocacy and media relations.

Activities
- Education: web sites, pamphlets, workshops, exhibits, handouts
- Promotion: National Immunization Awareness Week (May), Influenza
- Immunization Awareness Month (Oct), posters, presentations, guides
- Advocacy: policy-makers and funders
- Media relations: assist journalists to research stories and identify experts
- CCAR member through CPHA
Seema Nagpal, B.Sc. Pharm, M.Sc.
Associate Director, Epidemiology
Office for Public Health
Canadian Medical Association
1867 Alta Vista Drive
Ottawa, Ontario K1G 3Y6
Tel: (613) 731-8610 or 1-800-663-7336 ext: 1682
Fax (613) 521-1268
Website: www.cma.ca
Email: seema.nagpal@cma.ca

Type of Organization/Project
• Professional association representing physicians in Canada

Description
The CMA is a national voluntary organization of individual member physicians, who are also represented through 12 provincial and territorial divisions. On behalf of its members and the Canadian public, CMA performs a wide variety of functions, such as advocating health promotion and disease/accident prevention policies and strategies, advocating for access to quality health care, facilitating change within the medical profession, and providing leadership and guidance to physicians to help them influence, manage and adapt to changes in health care delivery.

Activities
• Promote the dissemination of information to professionals and public
• Promote the optimal use of antibiotics
• Work with CCAR and NIPA as well as the Canadian Food Inspection Agency on AMR

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Jennie Strickland
2204 Walkley Road, Suite 100
Ottawa, Ontario K1G 4G8
Tel.: (613) 526-9397 Fax: (613) 526-3332
Web-Sites: http://www.cps.ca; www.caringforkids.cps.ca
Email: info@cps.ca

Type of Organization/Project
• National association

Description
A national, voluntary, professional association, the CPS represents more than 2,000 paediatricians, paediatric subspecialists, paediatric residents, and other child health care providers. The Society is also a partner of CCAR and NIPA.

Objective:
• To advance the health and well being of children and youth by nurturing excellence in health care, advocacy, education, research, and support of its membership

Activities (available in English and French)
• Prepared a Position recommending measures to control MRSA colonization of patients and to prevent MRSA from becoming endemic in paediatric health-care facilities
• Position paper currently in revision dealing with a series of strategies that should be adopted in order to limit the spread of antimicrobial resistance among pathogens that infect children.
• The “caring for kids” website contains a fact sheet on antibiotics: http://www.caringforkids.cps.ca/whensick/Antibiotics.htm
• Publishes Paediatrics & Child Health, a peer-reviewed journal (10/yr) containing information on antimicrobial resistance. Distributed to about 15,000 pediatricians, child healthcare professionals and family practitioners.
• The “Antibiotics Tool Kit” for physicians contains pamphlets about antibiotic resistance, two compliance pads for patients taking antibiotics, and two “non-prescription” pads with tips for parents on coping with a virus.
  • Kit materials explain the difference between bacterial and viral infections
  • Available on request for $5.00 ($4.50 for members)
**Canadian Pharmacists Association**

Mr. Barry Power  
1785 Alta Vista Drive  
Ottawa, Ontario  
K1G 3Y6  
Tel: 1-800-917-9489 or (613) 523-7877  
Fax: (613) 523-0445  
http://www.pharmacists.ca/  
bpower@pharmacists.ca

**Type of Organization/Project**  
- National association

**Description**  
The Canadian Pharmacists Association is the national voluntary organization of pharmacists. CPhA serves its members through advocacy, facilitation, provision of knowledge, participation in partnerships, research and innovation, education and health promotion.

**Activities**
- Awareness Campaigns: CPhA supports several initiatives of health care associations that promote the wise use of antibiotics:
  - Canadian Coalition for Influenza Immunization
  - Canadian Immunization Awareness Program (CIAP)
  - National Information Program on Antibiotics (NIPA)
- Member of CCAR

**Communimed**

Ms. Maggy Warda  
Partner  
Communimed Inc.  
1255 Green Avenue, 5th floor  
Westmount, Quebec H3Z 2A4  
Tel.: (514) 931-3100 ext 18  
Fax.: (514) 931-0877  
E-mail: mwarda@communimed.ca

**Type of Organization/Project**  
- Private company

**Description**  
To create and disseminate interactive patient information pamphlets targeted to the public.

**Activities**
- Generated informative interactive pamphlet.
  - Sponsored by the pharmaceutical industry and endorsed by the Canadian Infectious Diseases Society (CIDS)
  - Considered successful because there are many requests for refills from pharmacists and many physicians have requested to have the pamphlets in their waiting rooms
  - Part of a series of information that can be found in over 3,000 pharmacies and 1,000 physicians’ offices across Canada
  - Up-dated annually
Do Bugs Need Drugs?

Mary Carson, PhD, Program Coordinator
Capital Health
Suite 1835 College Plaza
8215 – 112 Street
Edmonton, Alberta T6G 2C8
Tel.: (780) 413-5860 or 1-800-931-9111
Fax: (780) 407-6430
E-mail: mcarson@cha.ab.ca
www.dobugsneeddrugs.org

Type of Organization/Project
- Multi-stakeholder community demonstration project

Description
Educational program targeted at doctors, pharmacists, students and the public.

Objective:
- To optimize antibiotic prescribing for respiratory tract infections

Activities
- A pilot project, Grande Prairie, Alberta, October 1998-March 1999, included educational workshops for physicians, pharmacists, physician office staff, grade two students and the public. The program was expanded nationally by 2003.
  - Three key messages:
    - Handwashing is the most effective way to prevent the transmission of RTIs.
    - Antibiotics are not effective for viral infections.
    - Antibiotics need to be used wisely.
  - The results of the pilot included a 12% reduction in antibiotic prescriptions for RTIs compared with the year before and increased public awareness of the appropriate use of antibiotics and the importance of handwashing.
- Educational programs for physicians (including CME credit), pharmacists, dentists, continuing care, first nations, occupational and public health, seniors, students, and daycares.
- Communications include a multilingual website, multilingual print materials, a toll-free number and television ads.

Focus Technologies Inc. (formerly MRL)

Amy Linares
Marketing Coordinator
13665 Dulles Technology Drive, Suite 200
Herndon, Virginia USA 20171
Phone: (703) 480-2500 or (877) 480-2500
Fax: (703) 480-2670
Email: alinares@focustechnologies.com
Website: www.focustechnologies.com

Type of Organization/Project
Private company

Description
Founded in 1978 as a specialized infectious disease reference laboratory with a focus on rare and emerging infectious and immunological diseases. This organization is dedicated to accelerating the development of new anti-infectives and vaccines to improve the health of patients and populations compromised by infectious disease. It works in conjunction with pharmaceutical, biotechnology, government and healthcare organizations throughout the world. It serves the North American healthcare community from USA based facilities in Virginia and California. Traditional microbiological and immunological test methods are employed as well as new molecular technologies to provide in depth diagnostic services for a variety of infectious agents.

The largest online, on-going global antimicrobial resistance database that combines the power of information technology with current microbiology data is maintained.

Objective
- Customized services for the discovery, development and commercialization of new and existing anti-infectives
- Provide high quality, accurate, innovative testing for the diagnosis and management of newly-recognized and infrequently encountered infectious diseases

Activities
- Established The Surveillance Network® (TSN®) in 1993. The TSN Database-Canada was initiated in 1997 to respond to increasing antimicrobial resistance concerns in Canada. Data are currently contributed from over 95 sites and contains over 27 million AST results from 1.6 patients representing ~3 million strains.
Manitoba Antimicrobial Research Laboratories (MARL)

Dr. George G. Zhanel  
Medical Microbiology, Faculty of Medicine  
University of Manitoba  
MS673 Microbiology, Health Sciences Centre, 820 Sherbrook St, Winnipeg, Manitoba, Canada R3A 1R9  
Ph: (204) 787-4902  Fax (204) 787-4699  
Email: ggzhanel@pcs.mb.ca

Type of Organization  
- Research Group representing academic clinicians and scientists

Description  
Understanding the prevalence and epidemiology of antibiotic resistant infections, describing the clinical relevance of resistant infections, identifying and developing molecular diagnostic methods to rapidly diagnose resistant infections, investigating the molecular mechanisms of resistance and studying pharmacodynamic modelling and Monte Carlo analyses to provide optimal treatment of antibiotic resistant infections.

Activities  
- Specific pathogens and infections of research interest include antibiotic resistant respiratory infections (S.pneumoniae, H.influenzae, M.catarrhalis, S.pyogenes), antibiotic resistant urinary tract infections, vancomycin-resistant enterococci (VRE), antifungal resistant infections  
- Assessing the medical and economic outcomes of antibiotic resistant infections as well as studying the relationships between antibiotic use and the development of antibiotic resistant infections is a priority. Cellular and molecular mechanisms of resistance with macrolides, ketolides and fluoroquinolones in multi-drug resistant organisms  
- Treatment of multidrug resistant S.pneumoniae, H.influenzae, P.aeruginosa. Investigation of the activity and pharmacodynamic properties of investigational antibiotics

Categories  
Surveillance

National Information Program on Antibiotics (NIPA)

Barb Roberts  
Hill & Knowlton Canada Ltd.  
160 Bloor Street East, Suite 700  
Toronto, Ontario M4W 3P7  
Tel.: 1-800-565-4535  Fax: (416) 413-1550  
Web site: www.antibiotics-info.org  
E-mail: NIPA@hillandknowlton.ca

Type of Organization  
- A coalition of physician, pharmacist and patient organizations

Description  
The National Information Program on Antibiotics (NIPA) was created in 1996 by Pfizer Canada Inc. to help educate Canadians about the appropriate use of antibiotics. The coalition is comprised of eight healthcare organizations: AMMI; Canadian Medical Association; Canadian Paediatric Society; Canadian Pharmacists Association; Canadian Public Health Association; Canadian Thoracic Society; Canadian Lung Association; College of Family Physicians of Canada.

NIPA's mandate is to communicate to healthcare professionals and the public to help fight the problem of antibiotic resistance.

Objectives  
- To help Canadians understand the importance of using antibiotics only for the treatment of bacterial infections  
- To raise awareness and understanding of the issue of antibiotic resistance  
- To motivate behavioural change in the prescribing and use of antibiotics

Activities  
- Provides educational materials to physicians and pharmacists to help educate patients about the proper use of antibiotics  
- Provides information to consumers and healthcare professionals on its Web site  
- Holds annual press conference during National Antibiotic Awareness Week to present its National Report Card on Antibiotic Resistance  
- Member of CCAR

Categories  
Optimal Use
Newfoundland and Labrador Antibiotic Network (NLAN)

Dr. Jim Hutchinson
Dept. Of Microbiology
Health Sciences Center
Memorial University
St. John's, Newfoundland A1B 3V6
Tel.: (709) 777-7801
Fax.: (709)
E-mail: hcc.hutj@hccsj.nf.ca

Type of Organization/Project
• Non-profit hospital-based network based in pharmacies

Description
Based on the successful clinical pharmacy-based Antibiotic Utilization Team at the Healthcare Corporation of St. John's a new body called the Newfoundland and Labrador Antibiotic Network (NLAN) is currently being initiated. Several formative meetings have been held and a first board of directors has been identified. An executive director is expected to be in place in 2004 to start province wide initiatives.

Activities
Currently under development:
• Provincial hospital formulary
• Guidelines for empiric Rx, surgical prophylaxis
• Monitoring and reporting antibiotic use patterns to prescribers

Partners for Appropriate Anti-infective Community Therapy (PAACT)

Mr. J. Pilla, MSc, BScPhm. or Dr. J. Stewart, MD.
790 Bay Street, Suite 1150
Toronto, Ontario M5G 1N8
Tel.: (416) 597-6867 Fax.: (416) 597-8574
E-mail: paact@mumshealth.com

Type of Organization/Project
• Collaboration of private and public sector

Description
PAACT is an established antibiotic resistance reduction network with more than 2000 health professionals trained. Recognized internationally and in the peer-reviewed literature as the best antibiotic education networks in Canada and one of the best in the world. Over 8 years of research, development and programming.

Objectives:
• To reduce and improve the use of antibiotics targeted to frontline family physicians, nurse practitioners and pharmacists
• To provide concurrent community-based patient information in partnership with local pharmacies and public health
• To develop a primary care guideline implementation network

Activities
• A multi-phase education project directed at physicians and the public. Recent Program Highlights: Province wide expansion (15 regions); pilot in USA (Michigan); roll-out to Saskatchewan using two facilitator training sessions (Saskatoon and Regina). Currently, 70 trained facilitators across Canada, over 2000 trained.
• Concurrent public intervention in conjunction with local public health units and tailored to local needs
• Interdisciplinary health professional intervention includes MAINPRO-C accredited case-based, small group learning modules, practice toolkit including patient materials, non-Rx pads, participant manual, resistance FAQ and resistance resource list
PICNIC is a group of Canadian investigators with a special interest in pediatric infectious disease problems. Consists largely of specialists in childhood infectious diseases based at university-affiliated hospitals.

Objective:
- To promote, facilitate and engage in collaborative research that will advance understanding of the pathogenesis, causes, natural history, diagnosis, management and most importantly, prevention, of infections that affect the fetus, newborn, infant, child and adolescent

Activities
- Performs a variety of collaborative studies about paediatric infections, including some related to resistance
- Promotes, facilitates and engages in collaborative research on infections in children in which results are published
- Presents abstracts at national and international meetings
- Maintains web site