



Meeting Report



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National Collaborating Centre
for Infectious Diseases

Centre de collaboration nationale
des maladies infectieuses

Canadian Roundtable on Antimicrobial Stewardship
Meeting Report

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The Roundtable Process

On June 16-17, 2016, over 50 “Champions of Change” – experts, key influencers and stakeholders in the fields of antimicrobial stewardship and resistance – gathered in Toronto, Ontario, to begin developing a Canadian multi-sectoral Antimicrobial Stewardship Action Plan, spanning hospital, long-term care and community settings. The roundtable’s objectives were to:

1. Gather the information required to inform the development of a Canadian Action Plan, i.e.,
 - Curate and/or develop documents and reports in support of an evidence-informed approach;
 - Support the identification of key opportunities and gaps, actions required, and the resources and collaborations to address them;
2. Link domestic and international AMS efforts;
3. Identify key leaders and related accountabilities for the AMS post-Roundtable Action Plan, including commitments to new benchmarks and targets; and
4. Continue to build community awareness and a common language in support of implementing the AMS Action Plan.

The Roundtable was co-hosted by HealthCareCAN – the national voice of healthcare organizations and hospitals across Canada – and the National Collaborating Centre for Infectious Diseases (NCCID) – which provide knowledge translation for public health, with leadership and funding provided by the Public Health Agency of Canada. Expert advice was contributed by a Steering Committee and a Program Advisory Committee, who helped assure a relevant program and balanced participation.

In advance of the meeting, Roundtable participants reviewed several foundational documents to support an evidence-informed approach to developing a Canadian Antimicrobial Stewardship Action Plan. These included:

- The Communicable and Infectious Disease Steering Committee (CIDSC) Task Group on Antimicrobial Use Stewardship: Final Report to the Public Health Network Council (2016), containing 12 recommendations for core components of an AMS program or initiative
- [Building Canada’s Antimicrobial Stewardship Action Plan](#): a HealthCareCAN report on Issues and Insights from Interviews with AMS key informants (April 2016)
- [Championing Change](#): Action Steps to Inform the Canadian Roundtable on Antimicrobial Stewardship (June 2016).
- [World Health Organization Global Action Plan](#) on Antimicrobial Resistance (2015)
- Canada Communicable Diseases Report: [Antimicrobial Stewardship](#) (June 18, 2015), featuring information from successful stewardship programs and Canada’s Action Plan on AMR.

Assumptions Guiding the Roundtable

The Roundtable was guided by a number of assumptions developed in consultation with the roundtable's Steering Committee (see Appendix 2) as follows:

- Canadian efforts need to be seen as part of a global AMS effort that recognizes the four pillars of stewardship, surveillance, infection prevention and control, and innovation;
- The primary focus of the Roundtable was on stewardship of antimicrobials used in human health, recognizing that this is only part of a broader stewardship landscape that includes animal health, agriculture, and the environment; and,
- Improved human health prescribing requires action that cuts across hospital, long-term care and community-based care settings, and is supported by dedicated human and technical resources.

The definition of antimicrobial stewardship used at this meeting was “an organizational or healthcare system-wide approach to promoting and monitoring judicious use of antimicrobials to preserve their future effectiveness” (National Institute for Health and Care Excellence, 2015).

Roundtable Agenda

The Roundtable began with an open reception held immediately following the Canadian Public Health Association's Annual Conference and included experts in AM stewardship who set the table for the workshop later in the afternoon. These presentations led to an engaging discussion, including both roundtable participants and interested parties from the conference, which contributed significantly to discussions and decisions made over the course of the next day.

The following speakers launched the roundtable:

- Welcome and Introduction: Dr. Gregory Taylor, Chief Public Health Officer for Canada
- Call for Collaborative Action on AM Stewardship – Bill Tholl, President and CEO, HealthCareCAN
- Canadian Leading Practices in AM Stewardship – Dr. Andrew Morris, Director, Antimicrobial Stewardship Program, Mount Sinai Hospital - University Health Network; Dr. David Patrick, Medical and Epidemiology Lead for Antimicrobial Resistance and the Do Bugs Need Drugs Program, BC Centre for Disease Control
- Lessons from Abroad – Dr. Arjun Srinivasan, Associate Director for Healthcare-Associated Infection Prevention Programs, Centers for Disease Control and Prevention; Dr. Stephan Harbarth, Section Head, Infection Control Programme, University Hospitals of Geneva

Following the launch reception, roundtable participants heard two perspectives on the economics of antimicrobial stewardship programs provided by speakers with significant experience in developing and leading regional and institution-based programs, respectively. Dr. John Conly, Lead for the Alberta Health Services Regional AMS Program provided an overview of Alberta's program. Dr. Andrew Morris, Medical Director for the Mount Sinai – University Health Network AMS Program based in Toronto, provided a second perspective.

On the second day participants worked in plenary and at tables to review the documents supporting an evidence-informed approach to building agreement, and then to develop a 'Success 2020' statement as a basis for building an integrated AMS action plan for Canada.

Success Statement

Roundtable participants developed the following statement to describe “AMS Success 2020”:

We have optimized the use of antibiotics in Canada through a unified approach that connects human, animal, and environmental health, and re-establishes Canada as a global leader in antimicrobial stewardship.

We have accomplished this through:

- *Accountable and coordinated leadership across jurisdictions and professions*
- *Heightened public, patient, and provider awareness of the importance of antimicrobial stewardship*
- *A pan-Canadian approach providing for reasonably comparable or equitable programming*
- *Demonstrated improvements in AMS innovation, education, measurement, and research, and*
- *The development of efficient ways to implement or scale up leading practices across Canada.*

Participants affirmed the importance of strong leadership and clear accountabilities, while acknowledging that the responsibility for new and concerted action on antimicrobial stewardship would be shared among particular stakeholders. Prior to the event, commitments (Appendix 3) were expressed by several Roundtable participants. These initial commitments (i.e. further commitments will be sought and defined) helped to ensure Roundtable discussion was focused on actions, timelines, accountabilities and resources required in support of AMS Success 2020.

Priority Actions

Prior to the Roundtable, several key issues and related priorities for action on AMS were identified as part of preparatory work, which included consultation, document analysis, and rigorous review by the Steering Committee. With central consideration given to the Success 2020 statement, Roundtable participants applied their experience and expertise as well as the information provided in the foundational documents (noted above) to review and provide input on these priorities. The following priority actions for an integrated action plan on AMS emerged from the dialogue:

- A. Establish Leadership and Governance Structures for AMS
- B. Maintain Momentum on Programs that Work; Motivate Change for Better Performance
- C. Determine Baseline Targets and Benchmarks for Appropriate Antimicrobial Use
- D. Design and Execute an Antimicrobial Resistance Awareness Campaign
- E. Establish a Stewardship Research and Development Fund
- F. Promote Grants to Fund Research and Systematic Evaluation of Stewardship Programs and Prescribing Practices

- G. Establish a National AMS Network of Centres of Excellence
- H. Establish Directed Funding for Stewardship

Roundtable participants then worked in cross-disciplinary and regionally diverse groups, each assigned one priority area, to define the challenge for their issue and develop specific actions and related timelines, accountability for action in terms of leadership and stakeholder engagement, and the resources required to be successful.

Editor's Note: What follows below are the notes from the discussions at each table, reflecting the ideas and expertise of those who took on the subjects. As can be seen, there was some overlap of ideas and discussion points from one table to another. It is the intent of the organizers that the plans will be refined in the future, with additional evidence and knowledge brought to bear as the Action Plan is developed. Furthermore, not all table groups completed all portions of the notes templates and in may have identified only some potential leaders for specific actions.

A. Establish Leadership and Governance Structures for AMS

The challenge is to develop a recognized, effective and sustained multi-sectoral governance body with the authority and resources to ensure action on antimicrobial stewardship in Canada at all levels and across disciplines.

- This governance body will be accountable to the Federal/Provincial/Territorial (FPT) Council and to the sectors it represents;
- This governance body will be responsible for implementing the pan-Canadian AMS Action Plan by issuing funds for relevant action steps and programs.

Current activities in this area (individuals, groups and organizations) include:

- An F/P/T committee has been set up and has had its initial meeting;
- CIHR is working in collaboration with PHAC, participating in F/P/T government structures that have been set up
- Meetings have been held with Ministries in Ontario to identify which portfolio will be accountable for AMS; other provinces and territories will have to go through a similar process.
- The federal government, via the Public Health Agency of Canada, is mobilizing multi-sectoral and governance agencies through its role as a convener, e.g., by supporting this meeting.

Actions

Note that this group gave priority to outlining actions that could be undertaken immediately.

A1. Set up a stakeholder registry that includes all relevant government and non-government organizations and their relationships to AMS. This registry should identify knowledge users and—where there is expertise—include mandates and existing activities in AMS.

Timeline:	January 2017 and then on an evergreen basis
Leadership/Accountability:	National Collaborating Centre for Infectious Diseases
Stakeholder Engagement:	Roundtable participants will be asked to identify other stakeholders they suggest
Resources Required:	Minimal (NCCID has a platform available and will solicit suggestions from Roundtable participants).

A2. Create and sustain a national governing body that would assume shared leadership for a concerted AMS Action Plan. Develop a terms of reference/charter for this governing body, including vision, objectives, membership.

Timeline:	January - March 2017: first draft
Leadership/Accountability:	To be proposed by the committee developing the terms of reference/charter; committee membership to include reasonable representation from both animal and human health perspectives. Environmental perspective (that is, the importance of stewardship to the environment, such as keeping resistant microbes out of water supplies) to be included after the terms of reference/charter is established.
Stakeholder Engagement:	Convene a small committee of Roundtable participants to develop the terms of reference/charter for this new pan-Canadian governing body.
Resources Required:	Committee commitment (likely over one-two days) is essential to ensuring a successful comprehensive first draft.

A3. Develop a compelling business case regarding the necessity for an AMS governing body.

Timeline:	December 2016 (to accommodate the F/P/T Council calendar).
Leadership/Accountability:	A core group of Roundtable participants.
Stakeholder Engagement:	Via the core group of Roundtable participants.
Resources Required:	Core group time commitment and expertise (one-two individuals to develop a preliminary draft and then complete several reviews) working in collaboration with the committee developing the terms of reference/charter for the pan-Canadian governing body (see A2).

Key Discussion Points

- A suggested name for this entity is “Antimicrobial Stewardship Canada” (AMS Canada) (although the table group did not necessarily agree to this).

- Are there existing bodies where this entity could be sheltered or attached to since it is highly unlikely that a new organization would be funded? Instead, an organization with the necessary infrastructure and operational capacity to add this on to its functions is needed, e.g., Canadian Foundation for Health Improvement? Canadian Agency for Drugs and Technologies in Health (CADTH)?
- Consider carefully the status of the governance body, e.g., a legal entity, a group that can speak freely on the AMS issues.
- Explore whether there is potential to secure CIHR funding through the Strategy for Patient-Oriented Research (SPOR) program to support a National Centre of Excellence (NCE) on AMS.
- Roundtable participants repeatedly highlighted that modest investments could yield significant results. There are over 23 million antimicrobial prescriptions for humans annually in Canada (30-50% of prescriptions are estimated to be unnecessary). The cost of human antimicrobial prescribing in Canada exceeds \$250 million. A 10% reduction would result in \$25 million in direct cost-savings annually.
- What potential models already exist for the governance body?

B. Maintain Momentum on Programs that Work; Motivate Change for Better Performance

The challenge is to enable successful growth and sustainability of skilled labour, the development of leading practices, allocation of dedicated staff, and foster cultural change at a grass roots level.

To bring key actors on board and support and sustain their initiatives, it is necessary to:

- Provide recognition locally, provincially and nationally for best practices in the human and animal health sectors for AMS;
- Support ongoing momentum across the continuum of care.

Current activities in this area (individuals, groups and organizations) include:

- Accreditation Canada has best practice process to identify leading practices; they have over 1000 best practices in their database and could be leveraged;
- Quebec undertook a program of continuing education for veterinarians, although it only lasted for one year;
- Some professional colleges have continuing education structures in AMS;
- Some schools have integrated stewardship into their curricula stewardship work groups.

Action

B1. Develop a robust pan-Canadian structure (including recognition and accreditation) that aligns stewardship across the country, across sectors, and for all populations, including Indigenous peoples.

Timeline:	January 2017
Leadership/Accountability:	<p>Accreditation Canada has developed Required Operational Practices (ROP) for AMS in acute care settings; they also have standards for Infection Prevention and Control as well as leadership, governance, etc.</p> <p>There are ROPs for AMS, but people are having difficulty implementing these; Accreditation Canada has partnered with Mount Sinai to provide online step-by-step information about implementation (acute care settings only).</p> <p>Ministries of health and agriculture</p> <p>Public Health Agency of Canada – potential role in online education</p>
Stakeholder Engagement:	<p>Educational institutions to mandate stewardship component in curricula</p> <p>Professional bodies: continuing education across all sectors that is mandatory for licensing</p>
Resources Required:	<p>Minimal resources will be required for start-up as both leadership and stakeholders have the opportunity to support AMS through existing mandates.</p> <p>Some funding support to develop an NCE in AMS. (See Priority G: Establish a National AMS Network of Centres of Excellence).</p>

B2. Undertake an annual renewal of stewardship online education. Every stakeholder involved in animal and human health should have mandatory continuing AMS education training, with common and specific discipline components for each program.

Timeline:	<p>January 2017: initiate, depending on readiness of sectors, communities, etc.</p> <p>July 2018: complete implementation</p>
Leadership/Accountability:	<p>Pan-Canadian structure in collaboration with:</p> <ul style="list-style-type: none">- Professional bodies- Academic institutions- Provinces and territories- Public Health Agency of Canada support

Stakeholder Engagement:	Relevant organizations, groups and individuals will identify their needs, e.g., <ul style="list-style-type: none"> - Academic institutions - Licensing bodies - Professional colleges
Resources Required:	The resource burden for implementation of this step will vary by context, but will generally be low, depending on the organizations and groups involved., Examples of resources required may include: e.g., <ul style="list-style-type: none"> - Expert advice - In-kind contributions - Small new funding amounts

B3. Engage expert roundtable participants in (i) identifying their representatives on the F/P/T AMS structure and (ii) supporting the implementation of actions outlined in this plan and evolving over the next two years.

Timeline:	May 2017: a pan-Canadian AMS Framework is in place May 2018: the AMS Action Plan is in full swing
Leadership/Accountability:	PHAC facilitates and convenes meetings Ministers of Health and Agriculture support implementation of the plan
Stakeholder Engagement:	F/P/T AMR Steering Committee works actively with public health, health care, and agriculture sectors Accreditation Canada is supportive through its policy levers
Resources Required:	PHAC to convene meetings; could be in-kind contribution. New funding would be required for: paid experts to develop programs, health care structures to support implementation, and the required information technology for data management support.

Key Discussion Points

- Canada was once regarded as leading the world in recognizing and responding to the threat of antibiotic resistance (2004), but is now lagging relative to comparator countries. While subsequent concerted efforts appear to have stalled, pockets of excellence exist across Canada. We have not yet, however, found the means or the will to scale up and spread these leading practices.
- Based on estimates of successful provincial/territorial initiatives for Do Bugs Need Drugs, a modest federal investment of \$.10/capita matched by P/Ts (or \$7.2M/year over three years) would be sufficient to support proposed AMS actions.

C. Determine Baseline Targets and Benchmarks for Appropriate Antimicrobial Use

The challenge is to develop a pan-Canadian approach for standards to measure antimicrobial use and subsequently, standards for appropriate antimicrobial use.

- To the extent that jurisdictions collect and report data on antimicrobial use, there is major variability and lack of cohesiveness in terms of the metrics used, which makes it impossible to establish standards and benchmarks for improvement at a national level and also allow for comparison.

Various metrics are used, such as Days of Therapy (DOT), Defined Daily Doses (DDD), and number of prescriptions. Each of these has advantages and disadvantages (depending on the setting and patient population) and this has led to a lack of standardization and difficulty accepting a validated metric.

- This challenge includes scaling down aggregate data to the local level in order to facilitate comparisons.

Current activities in this area (individuals, groups and organizations) include:

- Alberta and Saskatchewan have made progress towards surveillance of AMU in community settings, while The Canadian Nosocomial Infection Program (CNISP) is involved in a pilot project tracking AMU in selected Canadian healthcare institutions;
- BC has made important inroads towards tracking AMU over the past 10 years by tracking billing codes (which also has an approximation of the diagnosis) associated with antibiotics;
- IMS Health collects data on antimicrobial use, though this must be purchased. The Public Health Agency of Canada has purchased this data on antimicrobial use in humans and has used it for analysis and reporting.

Action

C1. Complete an environmental scan of how antimicrobial use data is currently collected, analyzed, reported and used in Canada and if possible, internationally. Consider the systems used to collect data, including IT platforms that may be suitable for scaling up, as well as the type of data collected.

Timeline:	Before January 2017
Leadership/Accountability:	NCCID
Stakeholder Engagement:	Researchers to engage directly with those responsible for collecting and administering AMU data at the provincial/territorial level as well as with CNISP Canadian Institute for Health Information (CIHI) Internationally (CDC, ECCDC, etc.)
Resources Required:	A financial commitment between \$10,000 and \$20,000. Researchers will require human and material resources sufficient

to send out structured surveys and undertake national-level engagement as well as write up research results.

C2. Strike an Expert Working Group to develop quality standards and indicators of appropriate antimicrobial use (including validated measurement(s) for AMU) in healthcare and community settings.

Timeline: July 2018

Leadership/Accountability: PHAC, NCCID, HealthCareCAN

Stakeholder Engagement: Experts on quality standards and indicators of appropriate AMU
Provinces and Territories (in particular provincial/territorial [P/T] Ministries/ Departments of Health) regarding access to billing data for research purposes, P/T representatives from the Pan-Canadian Public Health Network (PHN)

Resources Required: Expert Working Group: secretariat and administrative support, e.g., to convene teleconferences among experts.

C3. Define targets and benchmarks to meet requirements based on standards developed in C2.

Timeline: Approximately 2 years (date of completion contingent on C1 and C2)

Leadership/Accountability: PHAC, NCCID, HealthCareCAN

Stakeholder Engagement: Experts on targets and benchmarks for established AMU standards
Provinces and Territories (in particular provincial/territorial [P/T] Ministries/Departments of Health) regarding access to billing data for research purposes, P/T representatives from the Pan-Canadian Public Health Network (PHN)

Resources Required: Expert Working Group: secretariat and administrative support, e.g., to convene teleconferences among experts.

Key Discussion Points – not completed

D. Design and Execute an Antimicrobial Resistance Awareness Campaign

The challenge is to measurably change the culture of antimicrobial prescribing and use among professionals and the public through compelling story telling.

Current activities in this area (individuals, groups and organizations) include:

Campaigns for the Public:

- Antibiotic Awareness Week, administered by the Communications and Education Task Group on Antimicrobial Resistance (CETAR) and NCCID.
- The Choosing Wisely campaign, directed at both health professionals and the public.
- ‘Do Bugs Need Drugs?’ (BC, AB)
- France has implemented successful public awareness campaigns on AMS; these examples may hold lessons for Canada.
- The Get Smart campaign (USA)
- The 2014 PHAC AMR public awareness campaign; evaluation findings from the pilot project can inform future campaigns.
- Several documentaries have been developed (e.g. ‘Resistance’), but these have not been professionally scrutinized.

Campaigns for Professionals:

- Australia has national therapeutic guidelines for prescribing antibiotics.
- The Canadian Veterinary Association has prepared a guidance document, *Prudent Use of Antimicrobials*, and will host an antimicrobial summit in summer 2016.
- ‘Do Bugs Need Drugs?’
- ‘Non-prescribing prescription pads’ produced by NCCID for use by physicians as an aid to communicating with patients when a prescription is not warranted. Tear off sheets mimic a prescription, but provide the patient with information on symptomatic relief and guidance on when to return for reassessment.
- Quebec Ministry of Health guidelines
- The ‘Orange Guide’ (Anti-Infective Guidelines for Community-acquired Infections) in Ontario, published by PAACT.

Action

D1. Renew/improve on an existing AMS campaign focused on the public (including key target audiences) using a ‘fresh approach’ that makes use of compelling story-telling, and that bridges human, animal, and environmental health. The campaign goal would be to reduce demand for antimicrobials and change the culture of AM usage.

Timeline: June 2017: Develop the campaign strategy

June 2018: Complete campaign materials

Leadership/Accountability: Shared ownership between PHAC and NCCID

Stakeholder Engagement: Epidemiologists, social media/media specialists, marketers, representatives of the public (e.g. patient safety advocates,

representatives of Indigenous peoples, francophones, parents, caregivers etc.), behavioural scientists, health educators, and KT/KM professionals should be engaged to develop a campaign with maximum penetrance.

- Resources Required:
- To be identified based on the campaign requirements, e.g.,
- An influential or celebrity advocate may be beneficial (based on the success of climate change awareness campaign)
 - Distinct campaign materials will be needed for certain target populations, e.g., French language, Indigenous peoples. Appropriate skills, knowledge and engagement will be required to support this population/context specificity.
 - Epidemiological data may be required on which to base the selection of key target populations, e.g., women, caring for children and elderly parents may be a key demographic.
 - Social media resources may be employed, where appropriate.
 - The campaign may include development of Info-graphics, thus requiring appropriate expertise and resources.
 - A news outlet such as the CBC might help craft a story through a patient lens. Patient advocacy organizations may be needed to help broker and curate these stories.

D2 Develop broad meta-guidelines for professionals that establish minimum expectations for when and when not to prescribe. Require that guidelines be provided in all regions and that they comply with the minimum expectations. Reference existing guidelines and make them available to all prescribers.

- Timeline:
- June 2018: Develop meta-guidelines
- June 2019: All prescribers have access to guidelines that comply with minimum expectations. (Discussed possibility of shortening this timeline and defining a phased approach with milestones.)
- Leadership/Accountability:
- Engage leaders who have already developed standard guidelines, e.g. Anti-infective Guidelines for Community Acquired Infections (PAACT), Quebec Ministry, “Do Bugs Need Drugs”, and others to be identified.
- Stakeholder Engagement:
- A broad range of prescribers, including those associated with larger burdens of inappropriate prescribing should be engaged
- Key developers of existing guidelines, including: PAACT, ‘Do Bugs Need Drugs?’
- Inter-professional Associations (e.g., Health Action Lobby [HEAL])
- Professional Associations (e.g. College of Family Physicians, Canadian Dental Association, Canadian Nurses Association)
- Resources Required:
- Funding will be required to support the production of meta-guidelines, (e.g., expert guidance, administrative support for

convening meetings). A compendium of existing guidelines will also need to be developed to inform this effort, which will involve some cost as well. Funds will need to be leveraged for networking to support the provision of guidelines and promote uptake of minimum expectations outlined in meta-guidelines. Guidelines should be presented alongside local antibiograms for interpretation of guidelines within a context of local patterns of resistance.

D3. Develop aids that target the point of prescribing and mitigate challenges in patient-prescriber dynamics that contribute to inappropriate prescribing.

Timeline:	June 2019
Leadership/Accountability:	NCCID initially; other partners to be explored
Stakeholder Engagement:	Colleges of family medicine; other specialty colleges NCCID and others who have already developed similar aids
Resources Required:	An environmental scan of feasible prescribing aids will require expertise and administrative support Resources required will also depend on the type of aid, e.g., <ul style="list-style-type: none">- Electronic alerts that provide prescribers automated feedback on their own prescribing practices- A nonprescription prescription pad, e.g., adapt NCCID product, possibly to an App.- A prescribing aid that incorporates a 'watchful waiting' approach where the text 'To be filled on or after _____', (i.e. a target date) is included on the prescription.- Some organizations have existing materials that will need to be adapted to other settings and this will require expertise and production/distribution costs.

Key Discussion Points

Considerations for addressing the challenge -

- Providing information is not enough. AMR awareness campaigns need to tell the kinds of stories that propel behavior change.
- Campaign goals and success indicators must be clearly defined.
- The focus of awareness campaigns should be on both patients/public and clinicians.
- Specific target audiences need to be clearly defined and should be selected on the basis of evidence of where the greatest misuse of antimicrobials occurs.
- Campaigns must be nuanced for particular audiences and made applicable to different geographic settings and population contexts.

- Meaningful evaluation is essential. High-level feedback and polling are insufficient to the needs of planners. If qualitative evaluation methods are employed, they must be rigorous.

Other campaign mechanisms -

- Another idea explored was to develop a blog involving 50 Champions for Change (each blogger would share with their own networks). This social media mechanisms could have significant reach. Three to five experts could curate. A caution: would this mechanism be relevant to our key demographics?

Caveats -

- When involving marketers, media outlets, or journalists, precautions should be taken to ensure that messages remain evidence-informed, non-sensationalized, and reflect campaign goals.
- Meta-guideline development should involve natural leaders already engaged in guideline standardization with the caveat that some regions, provinces and territories won't be in the same place on this work. The idea is to probe for whether all tools accomplish the essentials, work to fill in the gaps, and borrow to develop an appropriate solution.
- Equity is an essential consideration, particularly outside urban centres. Consider mapping who has access to guidelines, particularly in rural areas. (For an urban centre in Manitoba the percentage is about 75%.)
- Guidelines alone aren't enough: it may be difficult to encourage prescribers to reference guidelines, as the tendency is to rely on what they were taught.

E. Establish a Stewardship Research and Development Fund

The challenge (given limited funds) is to prioritize research and development targets and to fund interventions (not just 'tools') with potential to meaningfully reduce inappropriate prescribing and that have potential for scaling up.

Central to this challenge is the fact that effective stewardship strategies are so different in inpatient and outpatient settings, and both deserve support.

Current activities in this area (individuals, groups and organizations) include:

- CIHR has recently released an Expression of Interest in a funding arrangement that may result in improved point-of-care diagnostics to aid prescribing in the community setting, though it should be noted that this working group felt that the role of a stewardship fund should penetrate beyond technical innovations to encapsulate process and policy innovations;
- HealthCareCAN has made public commitments to assist in the scale and spread of promising programs and strategies in AMS;
- PHAC is closely involved in identifying relevant research questions.

Action

E1. Secure a line of funding from federal and provincial sources for the proposed fund, ensuring that institutions and community funds are granted separately.

Timeline:	July 2017
Leadership/Accountability:	CIHR Federal departments with an interest in and responsibility for stewardship Ontario Provincial Government Provincial/territorial health research funding agencies (outside of Ontario).
Stakeholder Engagement:	CIHR should engage the government of Ontario and provincial/territorial funding agencies with a proposal for matching funds from those agencies. Ontario is separated out in this instance because that province does not have a discrete funding agency for health research outside of the Ministry.
Resources Required:	Initiate the fund at \$10m, with \$5m to accrue from federal sources and \$5m from provincial/territorial sources.

E2. Set up a Steering Committee for the fund to advise CIHR (presumed administrator) regarding priority setting. The Steering Committee should include representation from (i) both institutional and outpatient settings, and ii) identifiable system stakeholders including patient and aboriginal groups.

Timeline:	July 2017
Leadership/Accountability:	It is assumed that CIHR will act as the fund administrator and will gather members of the Steering Committee. However, given the politics of assembling the fund there is room to negotiate on this point.
Stakeholder Engagement:	Given the systemic nature of the stewardship landscape, it is advised that CIHR engage other federal stakeholders who have an interest, including responsible parties in agriculture. Leaders should also consider including external partners, ideally those with funds of their own to offer.
Resources Required:	Administrative support, including the ability to convene meetings and facilitate agreement building, is necessary.

E3. Develop a 'Social Innovation Fund' that awards researchers who successfully scale up leading practices. Outline specific rewards for specific returns.

Timeline:	July 2017
Leadership/Accountability:	The implementation committee could engage the Canadian Foundation for Healthcare Improvement (CFHI) to play a key role based on their recent funding initiatives and their role in the health system to initiate the development of the fund and suggest appropriate adjudicators.
Stakeholder Engagement:	Work with CFHI and the Steering Committee for the Research and Development Fund to identify approach stakeholder engagement including those who will adjudicate rewards.
Resources Required:	Administrative support, including the ability to convene meetings and facilitate agreement building.

Key Discussion Points

- It is important to ensure that the "Social Innovation Fund" only rewards researchers who are successful in this effort, i.e., based on specific measures of success.
- This fund would focus on "ensuring that the right patient receives the right intervention at the right time" based on a scope that includes community-based and institutionally-based programs, including training programs to benefit both patients and prescribers (suggestion: \$10m over 5 years).

F. Promote Grants to Fund Research and Systematic Evaluation of Stewardship Programs and Prescribing Practices

The challenge is to define and resource a research agenda that incorporates programmatic evaluation in terms of change in prescribing practices across jurisdictions and sectors.

Current activities in this area (as individuals, groups and organizations) include:

- Do Bugs Need Drugs? impact assessment;
- Evaluation of prescribing practices;
- Measuring use in Alberta, Ontario, British Columbia.

Action

F1. Create and resource a pan-Canadian network for AMR/S research (to identify indicators of success).

Timeline:	July 2017
Leadership/Accountability:	An individual identified within a Centre of Excellence or Network as AMR research leader
Stakeholder Engagement:	F/P/T Council, CIHR, Canadian Foundation for Innovation (CFI)
Resources Required:	Resources for a specific funding opportunity: a call for application for a dedicated fund

F2. Create a research agenda that incorporates the evaluation of programs, data standardization and prescribing practices, and prescriber feedback needs assessment.

Timeline:	July 2017
Leadership/Accountability:	An Advisory Group within a Centre of Excellence – does this assume that there would be a CE for AMS or could it be another CE?
Stakeholder Engagement:	CIHR, others?
Resources Required:	?

F3. Create and curate knowledge accrued through systematic evaluation for dissemination to public health, acute care, community and long-term care settings.

Note: this action was not developed further.

Key Discussion Points

- Encourage matched funding through collaborative efforts among provinces, territories and PHAC.
- Prioritize network formation over funding single projects.
- Study the drivers and constituents of success among programs.
- Explore the metrics of program harm.
- Evaluate the grants and mechanisms with respect to tracking progress of programs.

Genome Canada- decrease selection pressure?

- Encourage Principal Investigators across disciplines and geographies.

- Establishing network-

Program leadership: Structure of network enables clear leadership and structure; it is feasible; program is adaptable; will be cost effective as it will decrease duplication and ensure that projects align with overall research agenda; stakeholders will be engaged. Culture of patient safety- not sure.

G. Establish a National AMS Network of Centres of Excellence

The challenge is to create buy-in from a broad group of stakeholders with appropriate expertise in order to secure funding through the NCE program (or other appropriate programs). The goal of this program would be to establish a Network of Centres of Excellence focused on knowledge generation, mobilization and exchange

- The NCE would serve as a national clearinghouse and support a public education campaign.

Current activities in this area (individuals, groups and organizations) include:

- A number of centres in Canada have programs and capacity and demonstrate different models of AMS programs. These programs could potentially function as Centres of Excellence and some have expressed interest in applying for an NCE.
- CIHR's SPOR programs offers the possibility of funding
- Existing initiatives are already compiling data, guidelines, protocols, tools;
- Health Accord discussions are ongoing and include interest in innovation and information technology applications;
- There is a new sense of receptor capacity in the F/P/T world;
- There is an existing federal program for application for an NCE;
- Training programs are already in place, e.g., a webinar series with Accreditation Canada, and Royal College Preceptorship programs.

Action

G1. Develop a coalition of willing stakeholders to apply for NCE funding.

Timeline:	October 2016
Leadership/Accountability:	Academic leads from AMS programs and Roundtable Champions of Change
Stakeholder Engagement:	Connection with the F/P/T Council to develop the proposal, letters of support, and be involved with application In collaboration with 'AMS Canada' and through the joint Industry Canada and Health Canada NCE-knowledge mobilization initiative Inter-professional representation

Resources Required: Patient engagement
HealthCareCAN (as secretariat)
PHAC (convening and support capacities)

G2. To establish an NCE with a strategic plan and priorities for operationalizing an NCE that is focused on human health, spanning both inpatient and outpatient services (i.e, hospital and and community settings) with a mandate to engage in knowledge mobilization activities.

Timeline: June 2017

Leadership/Accountability: TBD

Ultimately, leadership/accountability will require an individual who can enable this NCE to function as a hub with nodes, with the NCE acting as a Centre for collaboration, training, and research generation, synthesis and exchange.

Stakeholder Engagement: TBD

Resources Required: This project will be funded through a Network of Centres of Excellence grant or through related funding mechanisms.

G3. Develop a strategic plan including priority-setting for the NCE as a clearinghouse, research centre (SPOR), and with consideration to apply for a WHO Collaborative Centre (One Health).

Timeline: First quarter 2018

Leadership/Accountability: NCE

Stakeholder Engagement: F/P/T Council

Leaders of other AMS Programs

Resources Required: TBD

G4. Reconvene a meeting with Champions of Change at this year's Roundtable.

Timeline: December 2017

Leadership/Accountability: Current AMS Steering Committee plus other interested parties

Stakeholder Engagement: TBD depending on process needs

Resources Required: Updates on actions determined as a result of Roundtable 2016, e.g., achievements, challenges, programs, campaigns

Data documenting behavior change in various groups

Key Discussion Points – not completed

H. Establish Directed Funding

The challenge is to obtain a dedicated pool of funding/resources to support human resources and Information Technology requirements in AMS programs in various settings, e.g., hospitals, long-term care, community.

Personnel needs may include director/pharmacist, physician, nurse, data analyst, and IT specialist.

Current activities in this area (individuals, groups and organizations) include:

- Programs such as the Mt. Sinai initiative and “Do Bugs Need Drugs?” have been developed and funded appropriately. More information is needed on the status and funding of programs across the country.

Action

H1. Develop centralized F/P/T targeted funding relative to the population in each province/territory, looking to the HIV/AIDS funding model as a potential example.

Timeline:	TBD
Leadership/Accountability:	Implementation Team and F/P/T Council
Stakeholder Engagement:	TBD
Resources Required:	TBD

H2. Determine the minimum resources needed to implement AMS effectively in different specific settings, e.g., acute care, long-term care, communities.

Timeline:	TBD
Leadership/Accountability:	TBD
Stakeholder Engagement:	Complete an environmental scan (in progress in BC), working with experts in various settings (hospitals, community, long-term care). Convene a working meeting of experts to determine the minimum resources needed in various settings.
Resources Required:	Financial support to complete the environmental scan and convene a national meeting and/or provincial/territorial meetings.

H3. Work with Accreditation Canada to explore options and related funding for strengthening ROP requirements, e.g., making them more specific.

Timeline: TBD

Leadership/Accountability: TBD

Stakeholder Engagement: TBD

Resources Required: TBD

H4. Focus funding on specific identified community needs, e.g., how to incentivize appropriate prescribing at walk-in clinics or rolling out “Do Bugs Need Drugs” across the country.

Timeline: TBD

Leadership/Accountability: TBD

Stakeholder Engagement: TBD

Resources Required: TBD

Key Discussion Points

- Industry is a key player in the bigger picture, particularly in support of directed funding.
- Accreditation Canada is currently doing reviews for acute care. Are they expanding to long-term care?

The more the Accreditation Canada lever is strengthened, the more likely the funding; leadership responds to Accreditation Canada ROPs and the need to meet them.

- Is it possible to create a single app that can be scaled up across the country?

Summary of Discussions - Key “Take Aways”

In advance of the Roundtable, Bill Tholl, President and CEO of HealthCareCAN, was invited to present on the outcome of the Roundtable to the Federal/Provincial/Territorial (F/P/T) Antimicrobial Resistance Steering Committee on June 23rd (one week following the Roundtable).

With this in mind, following the small group discussions at each table, Bill Tholl, encouraged participants to contribute to a consolidating process to establish 10 “key take aways” from the meeting. Mr. Tholl agreed to share these with the F/P/T Committee. The key “Take Aways” are summarized in a HealthCareCAN document entitled, *Preliminary Report on Key Action Steps*. This document, along with this meeting summary and Roundtable foundational documents, will inform the development of the Action Plan

Concluding Remarks

The Canadian Roundtable on Antimicrobial Stewardship concluded with comments and final suggestions from the participants. A number of participants committed to sharing the discussions and results with their own organizations and there were remarks that the meeting felt productive and held promise for concrete actions ahead. (A summary of the responses to the event evaluation is available from NCCID)

Health Care CAN and NCCID committed to circulating a full draft Action Plan by the end of the summer for comments and responses by the Roundtable participants. The engagement by all the Roundtable participants signifies a desire to take action on Stewardship at all levels and from all sectors.

Appendix 1: Roundtable Participants – Final List of Attendees

Full Name	Organization
Alainna Jamal	University of Toronto
Allison McGeer	Sinai Health System
Andrew Morris	UHN/MSH
Anne MacLaurin	Canadian Patient Safety Institute
Arjun Srinivasan	Centers for Disease Control and Prevention
Baillie Redfern	Indigenous Physicians Association of Canada
Bersabel Ephrem	Public Health Agency of Canada
Bill Tholl	HealthCareCAN
Bonnie Henry	Ministry of Health
Carole Nesbeth	Public Health Agency of Canada
Charles Frenette	McGill University Health Centre
Charles Thompson	HealthCareCAN
Cheryl Robbins	Canadian Indigenous Nurses Association
Colleen Flood	University of Ottawa Centre for Health Law, Policy and Ethics
David M Patrick	School of Population and Public Health - UBC
Dorothy Strachan	Strachan-Tomlinson
Gregory Taylor	Public Health Agency of Canada
France Légaré	Laval University/ CHU de Quebec and Universite Laval
Greg Penney	Canadian Public Health Association
Harpa Isfeld-Kiely	National Collaborating Centre for Infectious Diseases
Helene Sabourin	Accreditation Canada
Ian Culbert	Canadian Public Health Association
Jacqueline Arthur	Public Health Agency of Canada
Jane Pritchard	Council of Chief Veterinarians, BC Ministry of Agriculture
Jennifer Kitts	HealthCareCAN
Jennifer Raven	Canadian Institutes for Health Research
John Conly	Foothills Medical Centre/University of Calgary
John O'Keefe	Canadian Dental Association
Josette Roussel	Canadian Nurses Association
Judy Hodge	Katrime Integrated Health
Kanchana Amaratunga	Public Health Agency of Canada
Karen Michell	Council of Academic Hospitals of Ontario
Karl Weiss	Association des médecins microbiologistes-infectiologues du Québec
Kira Leeb	Canadian Institute for Health Information
Lindsay Ellen Nicolle	University of Manitoba
Manisha Mehrotra	Veterinary Drugs Directorate, Health Canada
Marc Ouellette	CIHR Institute of Infection and Immunity
Margaret Haworth-Brockman	National Collaborating Centre for Infectious Diseases
Marissa Becker	National Collaborating Centre for Infectious Diseases
Mary Carson	Do Bugs Need Drugs / Alberta Health Services
Mary Elias	Canadian Institute for Health Information

Michael Routledge	Manitoba Health, Seniors and Active Living
Nadine Sicard	Independent
Nisha Thampi	Children's Hospital of Eastern Ontario
Roy Wyman	College of Family Physicians of Canada
Santiago Alejandro Diaz	Canadian Patient Safety Institute
Sarah Silverberg	University of Toronto
Shannon Pearson	CIHR - Institute of Health Services and Policy Research
Shelita Dattani	Canadian Pharmacists Association
Shelly McNeil	Nova Scotia Health Authority
Shiv Brar	Therapeutic Products directorate - Health Canada
Simon Habegger	Do Bugs Need Drugs / Alberta Health Services
Stephan Harbarth	Hôpitaux Universitaires de Genève,
Susan Sutherland	Canadian Association of Hospital Dentists
Suzanne Rhodenizer Rose	Infection Prevention and Control Canada
Tim Lau	Vancouver Coastal Health
Valerie Leung	Public Health Ontario
Yoav Keynan	National Collaborating Centre for Infectious Diseases
Yoshiko Nakamachi	Sinai Health System - University Health Network
Yvonne Shevchuk	University of Saskatchewan

Appendix 2: Roundtable Steering and Program Committees

Steering Committee:

Co-Chair

Jennifer Kitts
Director, Policy & Strategy
HealthCareCAN

Dr. Andrew Morris

Chair, Antimicrobial Stewardship Stewardship
and Resistance Committee
AMMI Canada

Karen Michell

Executive Director
Council of Academic Hospitals (CAHO)

Sandi Kossey

Senior Director
Canadian Patient Safety Institute

Dr. Marc Ouellette

Scientific Director, Institute for Infection
and Immunity
Canadian Institutes of Health Research

Alternate: Allison Jackson, CIHR Project Lead
Major Initiatives

Dr. Yvonne Shevchuk

Professor of Pharmacy
Associate Dean Academic, Director, MedSask
University of Saskatchewan / Canadian Society for
Hospital Pharmacists

Co-Chair

Margaret Haworth-Brockman

Senior Program Manager
National Collaborating Centre for Infectious Diseases

Yoshiko Nakamachi

ASP Lead, Program Manager (ASP CSL)
Policy, Advocacy and Strategy, Antimicrobial
Stewardship Program
Mount Sinai Hospital / University Health Network

Jacqueline Arthur

Manager, Strategic Issues, Centre for Communicable
Diseases and Infection Control, Infectious Disease
Prevention and Control Branch

Public Health Agency of Canada

Carolyn Proulx

Accreditation Canada

Karey Shuhendler

Policy Advisor, Policy, Advocacy and Strategy
Canadian Nurses Association

Santiago Diaz

Patients for Patient Safety Canada

Program Advisory Committee

<p>Dr. Andrew Morris (Chair of Committee) Chair, Antimicrobial Stewardship and Resistance Committee Director, Antimicrobial Stewardship Program Mount Sinai Hospital/University Health Network 600 University Avenue, Suite 415 Toronto, Ontario M5G 1X5 Tel.: (416) 586-4800; ext. 8102 amorris@mtsinai.on.ca andrew.morris@uhn.ca</p>	<p>Yoshiko Nakamachi ASP Lead, Program Manager (ASP CSL) Policy, Advocacy and Strategy, Antimicrobial Stewardship Program University Health Network Munk Building, Room 8-PMB 100-132 585 University Avenue Toronto, Ontario M5G 2N2 Tel.: (416) 340-4800; ext. 3582 yoshiko.nakamachi@uhn.on.ca</p>
<p>Dr. David Patrick Medical Epidemiology Lead for Antimicrobial Resistance and the Do Bugs Need Drugs Project, BCCDC Professor and Director, School of Population & Public Health, UBC BC Centre for Disease Control and UBC Tel.: (604) 707-2541 david.patrick@bccdc.ca</p>	<p>Dr. Karl Weiss Professor of Medicine Chief, Department of Infectious diseases and Medical Microbiology Hôpital Maisonneuve-Rosemont, Faculty of Medicine, Université de Montréal Président de l'Association des Médecins Microbiologistes Infectiologues du Québec (AMMIQ) Tel.: (514) 252-3400; ext. 2693 weisscan@aol.com</p>
<p>Dr. Arjun Srinivasan Associate Director for Healthcare Associated Infection Prevention Programs Medical Director, Get Smart for Healthcare Division of Healthcare Quality Promotion Centers for Disease Control and Prevention 1600 Clifton Rd. MS A07 Atlanta, GA 30333 Tel.: (404) 639-2303 beu8@cdc.gov</p>	<p>Dr. Kanchana Amaratunga Canadian Nosocomial Infection Surveillance Program Public Health Medical Advisor, Infectious Diseases Centre for Communicable Diseases & Infection Control Public Health Agency of Canada 130 Rue Colonnade Road , Room 307B-04 Ottawa, Ontario K1A 0K9; A/L: 6503B Tel. (BB/cell): (613)-355-8288 kanchana.amaratunga@phac-aspc.gc.ca</p>
<p>Dr. Roy Wyman (Invited) Director, Certificates of Added Competence Academic Family Medicine Tel.: (905) 629-0900 1-800-387-6197; ext. 273 rwyman@cfpc.ca</p>	<p>Bill Tholl President and CEO HealthCareCAN 100-17 York Street Ottawa, Ontario K1N 5S7 Tel.: (613) 241-8005 btholl@healthcarecan.ca</p>

Appendix 3: Commitments Made by Champions of Change Prior to the Forum

Stakeholder	Commitment
<p>HealthCareCAN</p> <p>Bill Tholl, President & CEO</p>	<p>“HealthCareCAN is committed to supporting the scaling up and spreading out of stewardship best practices in healthcare facilities across the country. HealthCareCAN commits to host a national clearinghouse on AMS guidelines, best practices and programs to be accessible by healthcare professionals, patients, and citizens. We agree to collaborate with other stakeholders in AMS to ensure that our work in AMS continues well beyond the Roundtable. Finally, HealthCareCAN will leverage its position as the national voice for healthcare institutions in Canada to advocate for AMS in Canada, recognizing progress made and holding governments and healthcare leaders accountable for the progress we need.”</p>
<p>National Collaborating Centre for Infectious Diseases (NCCID)</p> <p>Margaret Haworth-Brockman, Senior Program Manager</p>	<p>“The National Collaborating Centre for Infectious Diseases (NCCID) is committed to furthering the development of antimicrobial stewardship through its role in knowledge translation and knowledge brokering. NCCID is able to work with organizations at all levels of authority and in a wide variety of public health disciplines to assist with providing evidence and information about stewardship programs, as well as assist with making connecting among people and organizations for continued exchange.”</p>
<p>Public Health Agency of Canada</p> <p>Jacqueline Arthur, Manager, Strategic Issues; Centre for Communicable Diseases and Infection Control</p>	<p>“PHAC is committed to its role as a convener of major parties in connection with the next steps and implementation of the antimicrobial stewardship action plan in Canada. PHAC further commits to bring forward the results of the Roundtable to the Federal/Provincial/Territorial AMR Governance tables to inform the development of the Canadian AMR Framework.”</p>

Stakeholder	Commitment
<p data-bbox="228 296 620 432">Sinai Health System-University Health Network Antimicrobial Stewardship Program (SHS-UHN ASP)</p> <p data-bbox="228 554 565 653">Dr. Andrew Morris, Medical Director; Yoshiko Nakamachi, Program Manager</p>	<p data-bbox="646 264 1382 751">“The SHS-UHN ASP commits to leverage its antimicrobial stewardship leadership position and experience in establishing institution-based ASP initiatives in healthcare institutions. We will use our widely accessed website (antimicrobialstewardship.com) and its contents to support spread and adoption of best practices in antimicrobial stewardship nationally. Furthermore, we commit to work with various stakeholders interested in improving AMR and AMU data access and quality, along with data custodians, to improve collection, manipulation, interpretation, and dissemination of clinically meaningful data. The SHS-UHN ASP will use its leadership position to help establish a coordinated interprofessional national effort to improve antimicrobial prescribing and use.”</p>
<p data-bbox="228 779 570 877">Association of Medical Microbiology and Infectious Diseases (AMMI) Canada</p> <p data-bbox="228 936 581 968">Dr. Caroline Quach, President</p>	<p data-bbox="646 779 1382 1373">“AMMI Canada commits to continue in its role as the Canadian medical specialty society with membership serving as experts in the appropriate use of antimicrobials. Using our website, newsletters, and other methods of communication, we will disseminate information to the healthcare community and public relating to appropriate use of antimicrobials. AMMI’s Antimicrobial Stewardship and Resistance Committee (ASRC)—which broadly represents Canadian expertise in the field— will work with other leaders in the national antimicrobial stewardship and resistance effort, to develop, implement, and disseminate best practices around appropriate use of antimicrobials. AMMI remains committed to the project of identifying knowledge users for antimicrobial stewardship resources. We further commit, through the ARSC, to work towards identifying knowledge gaps in antimicrobial stewardship and resistance and to support knowledge synthesis (e.g. systematic reviews).”</p>
<p data-bbox="228 1402 586 1472">Canadian Institutes of Health Research (CIHR)</p> <p data-bbox="228 1541 597 1640">Dr. Marc Ouellette, Scientific Director, Institute for Infection and Immunity</p>	<p data-bbox="646 1402 1377 1892">“The Canadian Institutes of Health Research (CIHR) is committed to funding, through its different research programs, various projects focused on the evaluation or the improvement of current practices in the prescription of antimicrobials. CIHR commits to supporting innovative approaches to stewardship, including funding projects developing alternative therapies or preventive strategies in order to reduce consumption of antimicrobials. We will support knowledge creation and translation of results for supported projects focused on stewardship measures. We commit to support follow-up meetings with stewardship implementers, industry and other partners to contribute to the overall reduction of antimicrobial use and the associated healthcare burden of antimicrobial-resistant infections.”</p>

Stakeholder	Commitment
<p>Accreditation Canada</p>	<p>“Accreditation Canada commits to working with partners to support health care organizations to optimize antimicrobial use through the accreditation program including evidence-informed standards, education and sharing of leading practices.”</p>
<p>Canadian Nurses Association</p>	<p>“The Canadian Nurses Association commits to collaborate on multisectoral AMS activities, providing a nursing voice to inform the development of a Canadian action plan. We will work toward building momentum on AMS and on raising awareness and engagement in stewardship activities through the dissemination of evidence-informed resources regarding antimicrobial stewardship to our more than 139,000 members, and to our network of 45 nursing specialties through our multiple media outlets (email, social media, webinar, feature(s) in CNA’s journal <i>Canadian Nurse</i>). Contingent on funding, CNA further commits to lead and/or support the development of educational resources and/or an evidenced-informed tool kit for antibiotic prescribing for nurse practitioners and registered nurses in Canada.”</p>
<p>Yvonne Shevchuk Professor of Pharmacy/ Associate Dean Academic/ Director, MedSask University of Saskatchewan</p>	<p>“I commit to making contact with various faculties across Canada (pharmacy, medicine and nursing) to encourage review of the curriculum to include Antimicrobial Stewardship as a required component of the curriculum.”</p>
<p>Canadian Patient Safety Institute</p> <p>Sandi Kossey, Senior Director; National Integrated Patient Safety Strategy</p>	<p>"Antimicrobial resistance is a significant patient safety burden and the Canadian Patient Safety Institute recognizes the importance of stewardship in preventing the spread of resistant pathogens that will ultimately harm patients and endanger the public. The Canadian Patient Safety Institute is committed to partnering with providers, leaders, policy makers and patients and the public to reduce harm and build knowledge, capacity and a culture of learning and improvement in support of antimicrobial stewardship programs across Canada."</p>

Stakeholder	Commitment
<p>Patients for Patient Safety Canada</p>	<p>“Patients for Patient Safety Canada (a patient-led program of the Canadian Patient Safety Institute and affiliated with the World Health Organization Patients for Patient Safety global network) is committed to ensuring that the voice, experience, and perspective of patients and families are embedded at every level of our healthcare systems. Patients for Patient Safety Canada will advocate that patient and family advisors are partners in antimicrobial stewardship programs so that patients and the public may better understand antimicrobial use and their role as active participants in stewardship efforts.”</p>
<p>Council of Academic Hospitals of Ontario</p> <p>Karen Michell – Executive Director</p>	<p>CAHO has supported two antimicrobial stewardship projects (ASPs) through its Adopting Research to Improve Care (ARTIC) Program. This program established a fully functional ASP in each participating hospital’s ICU and be able to report antimicrobial consumption, antimicrobial costs, antimicrobial resistance, and <i>C.difficile</i> infections on a quarterly basis to allow comparisons across sites. As a result:</p> <ul style="list-style-type: none"> • CAHO ASP in ICU Project successfully implemented and sustained ASPs in 14 participating ICUs (11 adult, 3 pediatric). • ASPs in adult ICUs showed a 23% reduction in antimicrobial consumption, and a 16% reduction in antimicrobial cost. In concrete terms, the implementation of ASPs resulted in avoiding roughly 130,000 daily doses of antimicrobials. • ASPs in pediatric ICUs showed a reduction in consumption ranging from 17-34% in days of therapy, but cost differences were modest and varied. <p>A second project was implemented [Antimicrobial Stewardship Program (ASP) ARTIC Community Hospital ICU Local Leadership (CHILL)] aimed at building capacity and knowledge through the establishment of ASPs in community hospitals across Ontario to optimize the use of antimicrobials in ICUs, increase patient safety and quality of care.</p> <p>CAHO is committed to sharing information about lessons learned from these two provincial implementation projects in order encourage the success of a national ASP effort.</p>

Appendix 4: Selected Milestones



Now is the Time to Take Action


The Canadian Action Roundtable on Antimicrobial Stewardship is taking place at an opportune time. Momentum with respect to the importance of antimicrobial resistance and stewardship – *both nationally and internationally* – is growing. The unprecedented amount of attention directed to this issue presents an opportune time for Canadian Roundtable “Champions of Change” to take action.

Selected Milestones

A brief outline of selected key milestones – national and international - is below. (🇨🇦 indicates a Canadian-specific event):

1997: Antimicrobial stewardship has been recognized as an urgent public policy priority since at least 1997, when the term was first used at a Canadian Consensus Conference entitled “Controlling Antimicrobial Resistance: an Integrated Action Plan for Canadians”. Since then, there have been numerous initiatives, conferences, consultations and reports aimed at policies that promote appropriate prescribing of antimicrobial therapies.

🇨🇦 2011: The Public Health Agency of Canada (PHAC) identified antimicrobial resistance as one of the most significant public health risks facing Canadians.


 **2013: Accreditation Canada establishes a Required Organization Practice (ROP) for antimicrobial stewardship** to optimize antimicrobial use for organizations providing acute care services (introduced in 2012, evaluations began in 2013).

 **April 2014: Canadian Health Portfolio Actions on Antimicrobial Resistance released.**

September 2014: US President Barack Obama issued an Executive Order to Combat Antibiotic Resistance. The US Administration also issued its *National Strategy on Combating Antibiotic-Resistant Bacteria*, which outlines steps the U.S. government will take to improve prevention, detection, and control of resistant pathogens. The President's FY 2016 Budget nearly doubles the amount of Federal funding for combating and preventing antibiotic resistance to more than \$1.2 billion (to improve antibiotic stewardship; strengthen antibiotic resistance risk assessment, surveillance, and reporting capabilities; and drive research innovation in the human health and agricultural sector).


December 2014: In the United Kingdom, Jim O'Neill's (Chair) landmark Review on Antimicrobial Resistance is released which reported that unless action is taken to address global antimicrobial resistance, AMR could result in 10 million lost lives a year by 2050, more than the number of people who currently die from cancer. (Currently, around 700,000 people die each year from drug-resistant infections). The Review also reports that there will be a cumulative cost of at least \$100 trillion, more than 1.5 times today's annual global GDP.


 **October 2014: The Government of Canada released *Antimicrobial Resistance and Use in Canada: A Federal Framework for Action*.**

 **March 31, 2015: The Government of Canada released a *Federal Action Plan on Antimicrobial Resistance and Use* (building on the previously released *Federal Framework for Action*) and launched the **Canadian Antimicrobial Resistance Surveillance System (CARSS)**, a new surveillance approach aimed at providing an integrated, national picture of antimicrobial use and resistance across Canada.**

 **Also, on March 31st, 2015, the former Federal Minister of Health met with leaders representing human and animal health organizations to discuss the Canadian government's plan for combatting antimicrobial resistance.** Ensuring

the optimal use of antimicrobials (antimicrobial stewardship) was a key focus of the discussion.

 **The 2015 Canadian Federal Budget announced \$2 million per year to the Canadian Institutes of Health Research (CIHR)** in support of additional research to better understand and address the health challenges posed by antimicrobial resistant infections, with funding set to begin in 2016.

 **April 28th, 2015: Canada's Auditor General reported that, 'significant work [remains to be done] to develop a pan-Canadian antimicrobial resistance strategy'** and recommended greater collaboration by PHAC with a wide range of stakeholders to move forward in combatting antimicrobial resistance.

April 30, 2014: The World Health Organization warned that without urgent, coordinated action, "a post-antibiotic era - in which common infections and minor injuries can kill – is a very real possibility for the 21st century."

May 25, 2015: the World Health Assembly adopted a Global Action Plan on antimicrobial resistance. Member States, including Canada, endorsed the World Health Organization's Global Action Plan on AMR (GAP). Under GAP, countries are expected to have national plans to address AMR in place by May 2017 – UK, US, Sweden, Germany, Netherlands, Japan and South Africa already have plans in place.

October 8-9 2015: G7 Health Ministers, in Berlin, (including Canada) committed to "strengthen[ing] antibiotic stewardship programs for professionals in the medical and veterinary fields within our countries."

In 2015, the Global Health Security Agenda (GHS) identified AMR as a priority and Canada is one of the leading countries on the GHS AMR Action Package.

 **October 22, 2015: Canada joins the Transatlantic Task Force on AMR (TATFAR).**

January 2016: The US National Academy of Medicine issued a major Commission report on the threat of infectious diseases as a security concern. AMR was prominently mentioned in the report.


January 21, 2016, World Economic Forum: Over 80 pharmaceutical corporations signed the Declaration by the Pharmaceutical, Biotechnology and Diagnostics Industries on Combating Antimicrobial Resistance calling on governments and

industry to work in parallel in taking comprehensive action against drug-resistance infections. The statement sets out for the first time how governments and industry need to work together to support sustained investment in the new products needed to beat the challenges of rising drug resistance.


 **January 21, 2016: Antimicrobial Resistance endorsed as a priority at the Canadian Health Ministers' Meeting** (meeting of Federal, Provincial and Territorial Ministers of Health)

May 27, 2016: The United States reported the first case of a person carrying bacteria resistant to an antibiotic of last resort – a development that could mean “the end of the road for antibiotics”. This is the first time a colistin-resistant bacteria has been discovered in a person in the United States. In November 2015, scientists found a colistin-resistant strain of E. coli in pigs, raw pork meat and in a small number of people in China. The strain was later found in other parts of the world.

May 2016, World Health Assembly, Geneva, Switzerland: Antimicrobial resistance received significant attention at the WHA, including in bilateral discussions and at plenary sessions.

 **June 16-17, 2016: Canadian Action Roundtable on Antimicrobial Stewardship. HealthCareCAN and NCCID co-host a gathering of “50 Champions of Change”** – experts, key influencers and stakeholders in the field of antimicrobial stewardship – to initiate the development of a Canadian multi-sectoral Antimicrobial Stewardship Action Plan, spanning hospital, long-term care and community settings.

September 21, 2016: The United Nations General Assembly (UNGA) in New York will be holding a High Level Meeting on Antimicrobial Resistance to promote increased political awareness, engagement and leadership on antimicrobial resistance among Heads of States, Ministers and global leaders. This is a signal of the significance of AMR at the highest level, and is likely to result in stronger direction for action. A high-level political declaration will be considered – this is only the third time in history that public health high level declarations were considered by the UNGA (the first two were HIV/AIDS and non-communicable diseases).

 **May 2017: Canada, as a Member State of the World Health Organization, is expected to have a national plan in place to address AMR** (as a commitment to the WHO's Global Action Plan on AMR).

