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# Antimicrobial Resistance (AMR)

See also [Background to CMA Policy on Antimicrobial Resistance PD19-08](#)

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## Context

Antimicrobials (which include antibiotics) are a precious public resource and an essential tool for fighting infections in both humans and animals. Their importance to human medical, nutritional and economic security cannot be understated. Yet globally, antimicrobials are losing their effectiveness more quickly than new such drugs, treatments and therapies are being identified and introduced to market.<sup>1</sup> Over time, this dynamic has eroded the human antimicrobial arsenal, placing the lives and futures of an unacceptable number of people at risk.

Antimicrobial resistance (AMR) occurs when microorganisms such as bacteria, viruses, fungi and parasites come into contact with antimicrobial drugs, such as antibiotics, antivirals, antifungals, antimalarials and anthelmintics, and undergo changes. The drugs are rendered ineffective and cannot eradicate infections from the body.

AMR is an international challenge that threatens to reverse over a century of progress in public health, health care and human development attributable to antimicrobial use. Indeed, the effects of AMR are already being felt across Canada's health care system. Currently, Canada's dedicated investment in solutions to militate against encroaching AMR in the AMR and antimicrobial stewardship (AMS) fields (both federally and provincially/territorially) can only be viewed as wholly inadequate to address the scope of the problem and the risks it poses for the health of Canadians.

Therefore, to: (1) promote awareness of AMR; (2) incentivize investment in AMR mitigation strategies; and (3) support the mobilization of an effective suite of more clinically effective management/treatment practices and policies, the following target audience recommendations are offered.<sup>a</sup>

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<sup>a</sup> All the policy recommendations made in this document are *not* meant to be interpreted as clinical practice guidelines. Any individual who suspects they may have an infection should promptly consult a physician.

## Key AMR principle — the “One Health” approach

- a) The complexity of AMR underscores the need for coordinated action known as the “One Health” approach. The term implies integrated strategies that span the human, animal/agricultural and environmental sectors. Thus, cooperation across a wide variety of stakeholders is necessary to address the collective nature of AMR. These stakeholders include governments, health professionals, private and public partners, and the public at large.
- b) The One Health approach will require attention and investment in the following domains: (1) surveillance of antimicrobial prescribing and usage; (2) infection prevention and control practices that mitigate the spread of resistant pathogens; (3) stewardship programs and practices that educate health professionals, the public, and the private sector and nudge each into more appropriate patterns of supply and demand; and (4) a program of innovation, research and development focused on diagnostics, vaccines and alternative treatments to reduce reliance on antimicrobials. This includes the development of novel antimicrobials that expand the currently available arsenal.
- c) Given the global dimensions of AMR, a successful One Health approach will require ambitious investments in global AMR mitigation. Given that health infrastructure and resources are limited in low- to middle-income countries, the impacts of AMR will primarily be felt in those settings.

## Recommendations

### 1. Physicians and allied health professionals

Should:

- a) Be aware that AMR is a serious public health crisis.
- b) Know that various Canadian prescribing aides/guidelines are available to assist physicians in choosing appropriate antibiotics and improving practice (e.g., Choosing Wisely Canada).
- c) Know that using antibiotics appropriately can help combat AMR and that diagnosis and laboratory testing play a key role. This includes only prescribing antibiotics for conditions that are clinically infectious and of a non-viral nature. Viral infections are the greatest source of antibiotic misuse.
- d) Consider delayed prescriptions and/or prioritize follow-up for patients when diagnosis is initially undifferentiated or when symptoms worsen, progress or are prolonged.
- e) Know that prevention of infections through hand hygiene, vaccination and appropriate use of antibiotic prophylaxis is evidence based and effective
- f) Know that durations of therapy and dosage rates for treating many infections change with time and that you should prescribe antimicrobials for the shortest effective duration (using the narrowest spectrum possible).

- g) Consider the potential side effects of antibiotics (including *C. difficile* and allergic reactions) in prescribing and when counselling patients as to their potential side effects.
- h) Engage in conversations with patients about antimicrobials regarding:
  - i. their appropriate use;
  - ii. their potential risks;
  - iii. when to delay, begin or end an antimicrobial prescription (e.g., delayed prescriptions); and
  - iv. when to seek medical reassessment if symptoms worsen or persist.
- i) Ask your local hospital or specialty organization about educational initiatives related to antibiotic prescribing.
- j) Collaborate where possible with colleagues in other prescribing professions to reduce unnecessary antimicrobial use.

## 2. Patients and the Canadian public

Should:

- a) Be aware that AMR is a significant problem that is linked to the inappropriate use of antimicrobials like antibiotics. Therefore, commit to *only* taking antibiotics if they are prescribed and *only* as directed by an authorized health professional.
  - i. Never share, or use, the antibiotics of others as it may contribute to AMR and have serious consequences for your health.
- b) Consider that your expectations about antimicrobials may unduly pressure physicians, and other prescribers, to provide you a prescription when an antimicrobial would not be appropriate or helpful.
- c) Engage in a conversation with prescribers about:
  - i. whether an antimicrobial is necessary;
  - ii. the risks associated with taking an antimicrobial;
  - iii. whether there are simpler and safer options to pursue; and
  - iv. when you should take further actions if your symptoms worsen or do not improve.
- d) Rather than keeping antimicrobials in your medicine cabinet, throwing them in the garbage/toilet or sharing them with family or friends, practise a One Health mindset. Dispose of *all* unused and expired antimicrobials at your local pharmacy. This will limit the spread of resistance and prevent antimicrobials from finding their way into the environment.
- e) Help limit resistance by staying up to date with all recommended vaccinations, and practise good hand hygiene.
- f) If you or a family member have had personal experiences with AMR, consider sharing them with local politicians (provincial/territorial and federal).

## 3. Governments (federal, provincial/territorial)

Should:

- a) (Including internationally) immediately make *substantial, long term, coordinated and directly dedicated financial investments* in AMR and AMS. Specific areas to prioritize include:
  - i. AMR and AMS awareness campaigns targeted to the public;
  - ii. campaigns that support health professionals to incorporate AMS principles into their everyday practice;
  - iii. detailed, and integrated, action plans based on clear metrics of success and that address the needs of communities, primary care practitioners, patients and health care organizations (including long-term care facilities);
  - iv. practical surveillance of antimicrobial resistance, purchasing, prescribing and use that maximizes the opportunity to respond to changing landscapes;
  - v. studying in detail the links, and associated risks, between animal health and agricultural practices and human health;
  - vi. scaling up local AMS initiatives at the provincial/territorial and national health care delivery levels;
  - vii. pharmaceutical development pipelines and non-pharmacological treatment options for AMR infections;
  - viii. inexpensive, accurate and timely point-of-care diagnostic tests (usable in the community, at the bedside or in a clinic) to optimize prescribing; and
  - ix. fostering clinical research, development and innovation in the fields of AMR and AMS.
- b) Scale up coordination between federal and provincial/territorial AMR and AMS activities.
- c) Hold regular, high-level meetings of ministers of health, agriculture and finance (both federally and provincially/territorially) to discuss the implications of unchecked AMR and how best to mobilize public finances to address it.
- d) *Strongly* consider an arms-length, national-level taskforce to address AMR and AMS.
- e) Strengthen the roles of the chief public health officer and the provincial/territorial chief medical officers in addressing AMR and AMS.
- f) Undertake a timely review of the Canadian Antimicrobial Resistance Surveillance System (CARRS) with an emphasis on:
  - i. scaling up the system;
  - ii. standardizing all AMR reporting metrics across the country; and
  - iii. injecting adequate resources into AMR surveillance and tracking antimicrobial usage rates.
- g) Establish a permanent review body on infectious disease, including pharmacists, microbiologist and other experts, to evaluate the forthcoming Pan-Canadian Action Plan on AMR and release regular progress reports.

## 4. Health care institutions and organizations

Should:

- a) Implement strategic AMR plans that are coordinated, cross-departmental and adopted institution wide. These should be premised on:
  - i. standardized and comprehensive reporting metrics for AMR and antimicrobial usage;
  - ii. tailored infection prevention and control programs to screen for and effectively prevent new AMR infections;
  - iii. improving public and professional awareness of AMR organization wide;
  - iv. improving conservation measures such as prescribing practices (audit and feedback, incentives programs, etc.); and
  - v. supporting and incentivizing appropriate prescribing of antimicrobials.
- b) Evaluate whether existing policies and procedures, diagnostics and testing capacities, and multidisciplinary and organizational cultures are strategically geared toward combatting AMR.
- c) Where possible, develop collaborations with other local health institutions, clinical researchers and community, public and private partners to promote AMS.

## 5. Accreditation and regulatory bodies

Should:

- a) Regularly review and establish meaningful criteria for accreditation, ethical codes and regulatory practice standards surrounding AMR and AMS so that practitioners and health institutions can be informed, supported and kept up to date on emerging AMR trends, practices and issues.
- b) Adopt profession-specific mandatory requirements for AMR and AMS (proper credentialing and training, regular updating of knowledge and competence for prescribing antimicrobials, appropriate data collection regarding antimicrobial usage, etc.) as part of credentialing.
- c) Work to promote, support and enhance existing AMS practices and programs.
- d) Collaborate with health institutions, professional health associations and other accreditation and regulatory bodies to implement AMS goals/plans.

## 6. Colleges and faculties for medicine and allied health professions

Should:

- a) Promote and support more educational resources for AMS and AMR, throughout the continuum of education (undergraduate, postgraduate and continuing education).
  - i. Topics for these resources should include (1) awareness of AMR and AMS, (2) appropriate diagnostic testing, (3) strategies to minimize antimicrobial use and (4) personal prescribing practices.
- b) Promote and support research on AMR and the implementation and dissemination of effective AMS strategies.

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<sup>1</sup> Public Health Agency of Canada. *Tackling antimicrobial resistance and antimicrobial use: a pan-Canadian framework for action*. Ottawa: Public Health Agency of Canada; 2017. Available: <https://www.canada.ca/content/dam/hc-sc/documents/services/publications/drugs-health-products/tackling-antimicrobial-resistance-use-pan-canadian-framework-action/tackling-antimicrobial-resistance-use-pan-canadian-framework-action.pdf> (accessed 2018 Aug 10).