HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Standing Committee on Health

HESA • NUMBER 076 • 1st SESSION • 42nd PARLIAMENT

EVIDENCE

Thursday, November 2, 2017

Chair

Mr. Bill Casey

Standing Committee on Health

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● (1530)

[*English*]

The Chair (Mr. Bill Casey (Cumberland—Colchester, Lib.)): I call the meeting to order.

This is our 76th meeting of the Standing Committee on Health. We're going to continue our study on antimicrobial resistance.

We have a very distinguished lineup of guests today.

From Choosing Wisely Canada, we have Dr. Wendy Levinson, chair.

From Sinai Health System, we have Dr. Andrew Morris, director of the antimicrobial stewardship program. Welcome.

From Infection Prevention and Control Canada, we have Suzanne Rhodenizer Rose, past president; and Jennifer Happe, officer and director.

From the National Collaborating Centre for Infectious Diseases, we have Dr. Yoav Keynan, scientific lead.

Thanks very much for coming. We look forward to your testimony.

Dr. Levinson, would you like to start off with a 10-minute opening statement?

Dr. Wendy Levinson (Chair, Choosing Wisely Canada): Thank you for the privilege of addressing your committee. I am here in my role as the chair of Choosing Wisely Canada.

We are a national clinician-led campaign that helps clinicians and patients have conversations about unnecessary tests, treatments, and procedures in order to help patients make informed choices. We also organize an international collaboration of Choosing Wisely campaigns that are presently in 20 to 25 countries around the world.

There is evidence from the Canadian Institute for Health Information that up to 30% of all the tests and treatments we do are unnecessary, meaning that they don't add value for the patient, and in some cases they are potentially harmful. Certainly, unnecessary antibiotic use is one such problem, where it doesn't necessarily benefit the patient, can potentially have harm, and has harm potentially to the broader society as a driver of antimicrobial resistance.

As you well know, antimicrobial resistance is a global problem, with causes far beyond human health care, and there needs to be multifactorial solutions, but in health care, antibiotics are overused unnecessarily in hospitals, primary care and outpatient clinics, and long-term care facilities.

I will provide you a bit of the understanding of the drivers of the overuse and some insights into some strategies that might be used to tackle it. It's important to say that overuse of many tests and treatments, such as antibiotics, is complicated. Overuse is baked into our system. It's in our medical culture. There are clinician, patient, and systems factors that relate to this overuse.

Clinicians might prescribe antibiotics unnecessarily for a variety of reasons. They have a perception that patients want a prescription, and they want to please their patients. If you're with a parent and the child has been up all night with an earache and a fever, you want to provide relief. It can actually take longer to explain to a mother why her child has a viral infection, not a bacterial one, and that antibiotics won't help, so we know that it is often easier to just prescribe them.

We also know from research that patients are typically comforted if they feel that a physician has listened and paid attention to their symptoms. They don't necessarily need the prescription. To be frank, in a busy and full clinic, when doctors are rushed, it can be easier to write a prescription than have a conversation that physicians might experience as challenging.

On the broader public side, there are many misconceptions, as you know, about the effectiveness of antibiotics for common colds and viral infections. We live in a society where people might expect medicine to offer quick fixes and a magic pill for every ailment. That's our culture. Patients often come to the doctor's office with an expectation that they'll leave with a prescription in hand. They're also not aware of the potential harms in general of unnecessary tests and treatments, and certainly of antibiotics in particular.

Finally, there are just health system factors that drive unnecessary antibiotic use. For example, we lack in Canada good information systems to give feedback to doctors and other clinicians about their prescribing practices. We work in hospitals and clinics with a real heterogeneity in the types of computer systems that we have that could be harnessed to help prescribers pick the right antibiotic for the situation. We also in hospitals have existing order sets, which are basically pre-written orders for certain situations, and they might encourage overuse.

What does Choosing Wisely Canada have to do with this? In our view, change happens from the inside out. It's our view that health care professionals themselves need to lead the conversation about the problem of overuse in general, and specifically about antibiotics. This is done through national specialty societies. There are about 60 participating organizations right now, including family medicine, physician specialists, nurses, pharmacists, and dentists. These societies work internally to develop a list of Choosing Wisely recommendations that are inside their specialty. They pick, as a minimum, five tests and treatments that are clinically unnecessary or could potentially be harmful to patients. Having that physician, nurse, or clinician buy-in generating the lists ensures that the campaign is grassroots. We think that's the most effective way, rather than top-down.

● (1535)

At present, there are about 270 Choosing Wisely recommendations, and about 20 specifically addressing antibiotics. I'll give you a couple of examples. In family medicine, there's a recommendation that reads, “Don't use antibiotics for upper respiratory tract infections that are likely viral in origin.” For the emergency room, they have a recommendation, “Don't use antibiotics in adults or children with uncomplicated sore throats.”

Another way of engaging the clinicians in this is through the next generation. We are working to teach in medical schools. Two years ago we launched a very interesting program called Choosing Wisely STARS. It was actually started by the students. STARS stands for students and trainees advocating for resource stewardship. It's a grassroots, student-led campaign designed to change the culture in medical education by addressing the behaviours that drive overuse.

At the patient level, we also need to work to change patient and public expectations, but this is clearly a major challenge. We've been working on it through a number of strategies to promote the message that more is not always better. Maybe some of you have seen our hot dog with too much mustard on it, and of course, then, specifically, for antibiotics, it's the same.

The campaign has been aimed broadly at the public through the media. We've worked with news media, and radio and TV outlets, and have written op-eds, but more specifically, we've launched targeted campaigns to educate patients when they are in the physician's office where these issues are top of mind. For example, we've distributed posters to all the family doctors in Ontario where the message is that more antibiotics will not get rid of your cold. We have these posters and additional materials for patients because we're trying to promote patients asking three questions: do I really need antibiotics; what are the risks; and are there simpler or safer options for my condition?

Finally, there's a need to tackle the health system drivers. Physicians practise in a way that is strongly influenced by their local clinical environment. In order to tackle the system factors that drive overuse, we've tried to bring together stakeholders who influence that practice environment and make it easier for physicians to do the right thing, which is to avoid unnecessary prescriptions.

There's growing evidence in Canada through demonstration projects that we can change that practice environment. For example, in Newfoundland and Labrador, the Choosing Wisely group is giving primary care doctors data about their prescribing practices compared to their colleagues, and additionally, they have a big public education campaign about avoiding unnecessary antibiotics.

At Choosing Wisely, we help foster this burgeoning community of early adopters. In fact, just earlier today there were almost 100 sites on a webinar about antibiotics and how to avoid using them. We've seen clinicians really from coast to coast, in a variety of settings, such as hospitals and clinics, try to start using quality improvement measures to promote the recommendation that more is not always better.

Finally, of course, antimicrobial resistance is a global concern. As I mentioned, we have an international collaboration of between 20 and 25 Choosing Wisely countries. We've been working with the OECD, for example, which has measured the rates of antibiotic use in different countries. As you might know, our antibiotic use is quite a bit higher than that of some countries. In fact, it's double that of the Netherlands, so we're trying to learn from our Dutch colleagues why they did better than us on this, especially in their outpatient setting.

In summary, we have a long way to go to tackle the problem, but we're optimistic. We think unnecessary antibiotics, similar to other overused tests and treatments, are just part of the medical culture, but if we can engage physicians and health care professionals to provide leadership in making change, change is very possible.

● (1540)

Physicians are not the only drivers. We have to work in a complex system with a variety of clinicians, patients, and health care system factors. Between clinician leadership and patient education, we can stimulate those conversations one on one between doctors and patients or nurses and patients about whether the patient really needs these antibiotics or not. We're using evidence-based, informed strategies to change and work with the broad network of people in the system—clinicians, patients, the public, and the health care provider organizations—to try to deliver the message that more is not always better in health care, particularly with antibiotics.

I'm very eager to participate in your discussion.

The Chair: Thank you very much, and we're very eager for you to participate in our discussion.

Now we go to the Sinai Health System.

Dr. Andrew Morris (Director, Antimicrobial Stewardship Program, Sinai Health System):

Thank you, Mr. Chair and honourable committee members. I'm honoured to have the privilege and opportunity to present to you on antimicrobial resistance, or AMR.

I come to you as director of the Sinai Health System-University Health Network antimicrobial stewardship program. Sinai Health System and University Health Network are two academic health care organizations in Toronto that are widely recognized as local, provincial, national, and international leaders in health care.

As a note, without getting into semantics, I'm going to be using “antibiotics” and “antimicrobials” interchangeably for this presentation.

I became an infectious diseases physician so that I could cure people. Antibiotics are used to cure, miraculously. Antibiotics to infectious diseases physicians are like scalpels to surgeons. The only difference is that infectious diseases physicians don't really get the glory, the antibiotics do.

The heuristic of reliably curing people with any old antibiotic is gone. Frequently now, doctors guess at the infection they're treating, and often guess wrong. Increasingly, even when they know what infection they're treating, doctors find themselves at a loss to choose a curative antibiotic.

As potential patients, you should be scared. As lawmakers, you should be rightly driven to action by this most important global public health crisis of our generation.

I'll be describing four things for you. What are antibiotics? What is AMR? Why should the House of Commons Standing Committee on Health and the Canadian public care about AMR? What can you and Canada learn about tackling AMR from the Sinai Health System-University Health Network antimicrobial stewardship program?

What are antibiotics? Organisms in the environment, especially bacteria and fungi, fight each other for survival. By and large, antibiotics are the weapons used by fungi to ward off bacteria. Alexander Fleming taught us to exploit these weapons to kill bacteria, so that now, not only environmental bacteria, but also animal, fish, bird, and human bacteria, known as the microbiomes, are also exposed to antibiotics intentionally.

What is AMR? Antimicrobial resistance, or AMR, is basic Darwinian selection. Most bacteria exposed to antibiotics die off, but bacteria that have randomly developed a mutation rendering them resistant to the antibiotic end up thriving. These new emerged strains of bacteria are therefore antibiotic resistant. There really are only two things required for AMR to develop: bacteria and antimicrobials. AMR occurs naturally in the environment, but when the drug-resistant genes in bacteria take hold in a community, a farm, or a household, the ability to reverse the growth of drug resistance is uncertain.

Human bacteria shouldn't really have natural antimicrobial resistance. We don't usually interact closely with fungi and their antibiotics, so neither should our bacteria, unless we are exposed to antibiotics. The more we use and abuse antibiotics, the more we risk our microbiome developing resistance. We are where we are today because of rampant global antimicrobial use of little or no value.

Why should you and the Canadian public care about AMR? Canadians pride themselves on their health care. Canadians have come to expect safe pregnancy and delivery in neonatal care, management of common infections such as pneumonia or urinary tract infections, routine surgeries, and even organ and stem cell transplantation. These are threatened by antimicrobial resistance. For some of these conditions, this is a present-day threat rather than a future one.

Up to half of pathogens causing infections in cancer and surgery are already resistant to first line antibiotics in the U.S. I'd love to quote Canadian data, but we really don't have it, although it's likely comparable. Whereas untreatable infections were unheard of when I first started practising medicine, physicians like me are already routinely seeing patients for whom we use novel therapy to treat routine infections. Many antibiotics are rendered so obsolete by drug resistance that manufacturers have stopped producing them and clinicians have stopped learning about them.

When I started practising medicine, the only common AMR acronym in our medical lexicon was MRSA, or methicillin-resistant staphylococcus aureus. Today, that list includes KPC, ESBL, NMDA1, VRE, CDI, and the list goes on.

The fact that we have antibiotics supply insecurity—and I can't recall the last time we didn't have a shortage of one antimicrobial or another—exacerbates the problem. These drug-resistant organisms cost the health care system billions of dollars. This is juxtaposed with the over $1 billion we spend on prescription antibiotics in Canada, of which about half of the use is unnecessary.

● (1545)

Estimates by the World Bank are that the future AMR risk is greater than the global financial crisis of a decade prior. More importantly, it's a threat to national security and public safety and threatens Canadians in a manner greater than violence and accidents. However, AMR doesn't have headlines. There are no walks, runs, bike rides, golf tournaments, or galas for antimicrobial resistance. There's no ribbon, and the pharmaceutical industry has largely distanced itself from antimicrobial development.

Governments have been seduced into investing in industrial approaches to AMR, which are necessary, by the way, but it's at the expense of investment in the proven domains of public, animal, agricultural, and environmental health, which explore social determinants. I'd be remiss if I didn't point out the acuity of this need in our indigenous populations.

What can you and Canada learn about tackling AMR from my antimicrobial stewardship program at Sinai Health System and University Health Network? It's the first and largest of its kind in Canada. It reflects all that is right in tackling AMR in Canada, but it also shines a light on all that prevents further advances in AMR. In 2009, leaders with purse strings at my hospitals recognized the need to spend money to improve patient care and safety. They mandated a program with accountability and allowed the experts, people such as me, to run the show. Eventually the two organizations realized that collaborating and having a joint program with shared oversight would improve the efficiency of the two programs. Agreements were needed and policies implemented, but it got done.

The backbone of our program is a substantial and continued investment and obsessive focus on high-quality surveillance and epidemiologic studies of antimicrobial resistance and use in our hospitals. Over time we gradually built an interprofessional team that includes nurses, pharmacists, physicians, data and computer professionals, and management and project implementation experts.

Starting locally, we demonstrated improvement in antibiotic use coupled with financial savings. Bolstered by these successes, the Council of Academic Hospitals of Ontario, and subsequently, Health Quality Ontario, funded exporting our program and approach out of the province. The ecosystem we developed has spilled over to Public Health Ontario and national and international research projects and has helped train AMR leaders in other provinces.

Our pharmacists have taken leads in educating other pharmacists nationally, as well as running an innovative and groundbreaking course dedicated to the topic of antimicrobial stewardship. Our nurse steward, the first position of its kind in Canada, is poised to make knowledge of infections and antibiotics the core competency for nurses.

We have also enlightened health care leaders that these programs need project and program management professionals. Our manager is a major reason for our ongoing growth and success.

We have subsequently established best practices and made it easy for providers to access them. We have transparent reporting of our successes and failures, and yes, we have failed repeatedly. They can be seen on antimicrobialstewardship.ca. We also have a substantial and growing research enterprise refining how we can improve antibiotic use.

Although I'm proud of our program, what you really need to know are the things Canada needs. Mirrored on that, we need leadership with purse strings, expert leadership with a built-in accountability structure, and a substantial dedicated commitment to standardized, reliable surveillance of antimicrobial resistance and use across Canada, accompanied by epidemiologic inquiry.

We need to look at AMR interprofessionally, and ideally, with a one health view. That means involving the environment, animals, and humans.

We need to evaluate and scale up excellence across the country. We need to invest in tomorrow's AMR leaders. We need to definitively identify and make accessible what is accepted antibiotic practice. In Canada, we have no national standards of appropriate antibiotic use.

We need scientific investment. In Canada, antimicrobial stewardship and resistance research funding is less than $10 million per annum. Embarrassingly, my institutions' investments add up to upwards of 10% of this overall national investment.

The Canadian antimicrobial resistance surveillance system, the term “system” being a euphemism, doesn't have dedicated funding. It piggybacks on a benevolently unrelated envelope of infectious disease funding, and it is a patchwork of information that frustrates the many users it aims to satisfy.

That funding pales in comparison with the Canadian Institutes of Health Research's funding of $273 million for cancer or oncology, with another $95 million from the Ontario Institute for Cancer Research, $91 million from the Fonds de recherche Santé Québec, and numerous other research sources, including charitable foundations and industry.

● (1550)

Honourable committee members and Mr. Chair, on behalf of Sinai Health System and University Health Network, I am here to tell you that Canada needs federal leadership, with accompanying funding to move past the pan-Canadian framework on AMR to pan-Canadian action on AMR.

Expert health and scientific leadership needs to be put in place with an accountability structure involving provinces, territories, and the federal government, bringing together various disciplines in a one health approach that would be implemented with surveillance systems to gather, collate, and study antibiotic resistance and use.

Canada has the capacity to lead the world on this effort. We need to develop the next generation of experts, lure them into this mission critical field with an exponential increase in dedicated funding, independent of the important and, I fear, disregarded Naylor report, which I support. These new experts will research, innovate, and disseminate the necessary solutions to tackle AMR.

Thank you for your attention.

The Chair: Thank you for your presentation.

Now we'll go to Dr. Keynan.

Dr. Yoav Keynan (Scientific Lead, National Collaborating Centre for Infectious Diseases): Thank you, Chair and honourable members of the committee, for the opportunity to present here.

My name is Yoav Keynan and I'm the scientific director of the National Collaborating Centre for Infectious Diseases, or NCCID. The six national collaborating centres for public health were set up after the SARS epidemic. At that time they were fed by the experiences of perceived weaknesses in the public health system in Canada. Compared to that epidemic, AMR is a far deeper and more serious problem.

The NCCID is currently hosted by the University of Manitoba in Winnipeg under a contribution agreement with the Public Health Agency of Canada. Our mandate at NCCID is for knowledge translation and brokering to provide evidence and other information to inform public health practice and policy across Canada at all levels of authority. The centre fosters connections among public health practitioners, decision-makers, researchers, and clinicians, with a shared goal of improving control of infectious diseases in Canada.

Since its inception in 2005 under the early leadership of Dr. Ronald and Dr. Plummer, as well as others, the NCCID has played a role in bringing attention to antimicrobial resistance and the importance of appropriate antimicrobial surveillance, use, and stewardship. For example, the NCCID has been involved with hosting antimicrobial awareness week in Canada since 2010.

Since then, NCCID's involvement has grown, and the centre plays a role in AMR in public health, particularly supporting collaborative efforts to improve coordination and equitable delivery of stewardship initiatives across sectors, disciplines, and settings. Here I emphasize what Dr. Morris already mentioned, the area of inequity with the distribution of antimicrobial stewardship resources. There are fantastic centres of excellence within Canada, but it is not broadly available across all jurisdictions.

Working closely with the Public Health Agency and other partners and colleagues, the NCCID is able to convene and host in-person meetings across federal, provincial, and territorial jurisdictions and ensures the involvement of other agencies within the health portfolio.

Last year, in June 2016, NCCID co-hosted a national round table of antimicrobial stewardship leading to the development of a national action plan, “Putting the Pieces Together”, and to the establishment of AMS Canada, a national network of key stewardship experts and stakeholders co-chaired by NCCID.

Within two months of the round table and before AMS Canada formally released the action plan, we embarked on new work to bring evidence and other knowledge about stewardship to public health. The work is predicated on the critical role that public health has to play in controlling the emergence and spread of AMR. Public health partners with health care providers and facilities to promote education, surveillance, and prevention strategies. Public health has a strong role in planning infection prevention programs and strategies and is positioned to promote AMS across health care settings, particularly addressing known gaps in the deployment of community antimicrobial stewardship programs, rural settings, and in redressing inequities for structurally disadvantaged populations inadequately served by health systems.

I will highlight some examples of NCCID activities to inform and engage public health in addressing AMR. We have contributed to advancing public health professional knowledge of the burdens and drivers of AMR and to articulating the role in contributing to efforts to control AMR. In 2016 we commissioned two new reviews. One examines the role of animal and human health care in growing resistance globally and in Canada. The other provides a glossary to encourage shared understanding of the terminology.

Earlier this year we hosted a series of presentations at Public Health 2017 and brought antimicrobial resistance and stewardship to the forefront of this annual conference. The two documents will be circulated for those who are interested.

● (1555)

The NCCID models the public health sector's role in convening interdisciplinary knowledge exchange on sound and evidence-based AMS programs by providing opportunities for practitioners, researchers, and program planners to inform one another on successes and challenges in the regions or institutions specific to antimicrobial stewardship programs. For example, during the meeting in 2017, we hosted an Atlantic region stakeholder meeting, including a live webinar broadcast to exchange knowledge. Later this month we will be co-hosting accredited continuing education and training sessions for physicians, pharmacists, and nurses to open a dialogue on ways forward to improve the appropriate use of prescribing antimicrobials.

As another knowledge strategy, we have documented strategies that have been useful and have worked in Alberta to develop a provincial stewardship program, in an easy to read case study that is shared with other jurisdictions. The projects have helped to document challenges, gaps, and capacities for stewardship at national, provincial, and regional levels. These have included helping to convene exchanges in the Atlantic region, and we have worked with a proof of concept in a regional health authority in Manitoba, trying to use tools developed in other jurisdictions to implement an antimicrobial stewardship program.

As already mentioned, similar themes and challenges are emerging. There's a need for IT infrastructure, and there's inadequate capacity for developing metrics and analytics for antimicrobial use and resistance. There's an interest in obtaining readily available materials for practitioners and for patients...appropriate leadership to allow physicians and pharmacy partnerships. The lack of guidelines and access to existing guidelines was already mentioned.

We intend to analyze the distribution of stewardship programs, including how well stewardship is understood and implemented in rural and first nation communities, as well as the availability of materials and resources for francophone users.

Part of our role for the AMS stewardship program is fostering development in a community setting, including long-term care and continuing care, leveraging existing strengths and expertise from acute care settings such the Sinai Health System and University Health Network in Toronto, as was described.

We engage senior leaders and public health professionals to help situate information for use in a public health setting. An example is a webinar planned for later this month to feature the business case model for a stewardship program in acute care developed by the Association of Medical Microbiology and Infectious Disease Canada. This webinar will clarify the essential elements of a quality program with resources that are needed for effective stewardship. A senior public health physician will discuss helping public health physicians and trainees to understand the public health role, and applications for planning similar programs in the community.

In the past year, in partnership with Do Bugs Need Drugs? and Alberta Health Services, we are fostering a growing community of practice, or a network of practitioners and decision-makers who are keenly interested in understanding how to develop and implement AMS programs tailored to distinct contexts of long-term care and nursing homes—a huge gap. A series of webinars provides a platform to build relationships and foster dialogue. The first webinar was a testament to the acuity of the need, with an overwhelming response and 350 registrants.

NCCID has supported the development and dissemination of public education tools, particularly to primary care physicians, educating patients about necessary antibiotic use. We've revised and actively promoted our popular non-prescribing prescription pads, adding one that is for parents of young children. Working with regional health in Manitoba, we've helped adapt their own viral prescription pad and entered it into their electronic medical system.

Other collaborative efforts for awareness building include a national social media campaign and efforts for public health prescribers to coordinate and share consistent messaging. These efforts can lead to a more systematic, coordinated effort of awareness building, leveraging partners' positions to reach the various audiences.

● (1600)

This requires alignment through a proactive Canada-led plan. We see a need to get beyond Antibiotic Awareness Week to arrive at a more integrated strategy to build knowledge for changing prescribing habits.

Currently NCCID is assessing how well public health personnel can obtain and understand data of antimicrobial resistance surveillance in Canada. It is our intention to work with partners and to connect public health to data managers, perhaps ultimately leading to versions that public health can use for planning responses. Currently the surveillance data, as mentioned by Dr. Morris, is siloed and barely comprehensible.

Last, as a result of the activities across Canada fostering public health involvement and stewardship and reducing resistance, we're working with colleagues on applications for a national centre of excellence that can continue to sustain the efforts to combat antimicrobial resistance.

In summary, we see a continued need for strong leadership at the federal level. As mentioned earlier, this leadership needs to come with funding to adequately resource development implementation and the scaling up of programs. We need support for the national coordination of stewardship, to make sure that the endeavours that have already begun are continued, and public health leadership in planning, to improve the breadth of the initiatives, including ongoing recognition of the importance of public health and population health interests beyond the involvement with just their clinical and acute care settings.

Thank you.

● (1605)

The Chair: Thank you very much.

Now we will go to Infection Prevention and Control Canada, for 10 minutes. I'm not sure if you're going to divide your time.

Ms. Rose.

Ms. Suzanne Rhodenizer Rose (Past President , Infection Prevention and Control Canada): Thank you, Mr. Chair.

Good afternoon, everyone. My name is Suzanne Rhodenizer Rose, and I serve as past president of Infection Prevention and Control Canada. I am very pleased to be with you this afternoon to address the pressing issue of antimicrobial resistance, or AMR, in Canada. I am joined by my colleague, Jennifer Happe, who is an infection control professional and an officer of IPAC Canada.

IPAC Canada is a multidisciplinary association with over 1,600 members nationwide. It is committed to public wellness and safety by advocating for best practices in infection prevention and control across the continuum of care.

I want to begin by commending this committee for taking the time to study this issue, which deserves attention from elected officials and from the public they serve, though it's often reduced to a few short sound bites in the news. People who have heard of superbugs or pandemic influenza, for example, may be inclined to think that these issues are far removed from them, whether in the past or many continents away. However, that assertion is deeply flawed. AMR has been identified as a fundamental threat to the modern health care system. It creates challenges not just for the patients who endure its effects but also for the health care system as a whole. When the best medicines we have to combat illness cannot defeat the micro-organisms that infect people, illnesses become more easily spread and much harder to treat.

Additionally, the World Health Organization, which has shown exceptional leadership on this issue, has noted that antimicrobial resistance increases the cost of health care, with lengthier stays in hospital and more intensive care required. These are the facts of AMR, and they are the issues that our providers can find every day in Canada's hospitals, clinics, dental offices, and other care settings across the continuum. It is important to provide more detail on the pressure placed on hospitals and the health care system as antimicrobials become increasingly ineffective at treating certain pathogens.

In testimony to the U.S. House of Representatives in 2013, Dr. Tom Frieden, a CDC director, put the consequences very plainly. He said, “Patients with resistant infections are often much more likely to die, and survivors have significantly longer hospital stays, delayed recuperation, and long-term disability.” It should come as no surprise, then, that the overall capacity of our health care system declines daily as care providers find themselves using additional rounds of antibiotics and resorting to less commonly used, more toxic pharmaceuticals to treat the most prevalent antibiotic-resistant organisms such as MRSA or C. difficile, and the recent and concerning emergence of carbapenemase-producing organisms. At the same time, investments in new and improved treatments by pharmaceutical companies have declined, and professionals are not being equipped with the resources they need to effectively stem the tide.

Taken together, these facts make it more important than ever to ensure that appropriate infection prevention control measures are in place to limit the spread of antimicrobial-resistant organisms and to improve treatment when they are encountered in patients. Infection control professionals in Canada's hospitals, in public health roles, and in other care settings are working hard to ensure that this is the case. However, we have been fighting an uphill battle.

We believe Canada is well positioned to become a leader in the fight against antimicrobial resistance, but to get there for the good of our population, we will have to make significant investments that support national systems and provide funding for the adequate human resources to implement and encourage infection prevention and control practices across the care continuum.

Antimicrobial resistance is a very complex issue that cannot be addressed by a single policy change or advancement in medical practice and technology. Rather, the federal and provincial governments, health care professionals and administrators, the agricultural community, our international partners, and the public at large need to be aware of the pressing and global concern that has been echoed widely.

Steps have been taken by the federal and provincial governments and regional health authorities to address AMR challenges, including limiting the spread and occurrence of infections that are caused by antimicrobial-resistant organisms, and encouraging the responsible use of antimicrobials. However, there is one key area in which Canada remains behind other countries, and where the federal government needs to be a leader, and that is in tracking incidents of resistant bacteria and analyzing the success of our collective interventions.

The Government of Canada has published a document entitled “Antimicrobial Resistance and Use in Canada: A Federal Framework for Action”. There are four pillars of this framework that are strongly supported by IPAC Canada.

● (1610)

In order to effectively implement change, it's necessary to have the ability to measure whether steps taken are having the intended outcome. Through surveillance, which is one of the best measures of AMR, we have the number and the rate of antibiotic-resistant organisms in the health care setting.

In order to carry out surveillance effectively, measurement needs to occur in the same way, so that apples are compared to apples and oranges to oranges. When carried out in a uniform manner, surveillance provides a measure of the burden of illness, establishes benchmark rates for internal and external comparison, identifies potential risk factors, and allows for the assessment of specific interventions. As such, IPAC Canada urges the implementation of a national surveillance strategy for antimicrobial-resistant organisms.

Currently in Canada we largely measure the number and rate of resistant micro-organisms in different ways across the country. As such, the process is fragmented. AMR does not understand political and territorial boundaries. A fragmented approach defeats the goal of protecting the health of Canadians and does not align with the one health strategy or with the federal action plan.

We absolutely acknowledge that there are some measures in place to do this now, but we believe these piecemeal approaches are not suitable to address the growth threat of antimicrobial resistance that we face.

The Canadian nosocomial infection surveillance program, or CNISP, gathers data that is considered highly reliable yet covers only a very small fraction of the many health care facilities in Canada. Most hospitals and long-term care facilities are not currently able to participate in CNISP surveillance. CNISP also lacks the human resources support and technical infrastructure it needs to reach its full potential.

The existing Canadian Network for Public Health Intelligence, or CNPHI, is also gathering data, but could be better leveraged to support collection and integration with other data sources.

The Canadian Institute for Health Information, or CIHI, has recently explored the use of information and administrative data contained within individual patient medical records as a source of data on AMR and health care associated infections. While this electronic method of data collection is efficient and allows for global reach across the country, it cannot provide the level of reliability we need to accurately define the level of AMR in Canada.

The establishment of the Canadian antimicrobial resistance surveillance system, or CARSS, is a federal commitment to support the federal action plan on AMR and use in Canada and it has made an important first step in defining priority resistant organisms to conduct surveillance on; however, this is but one piece, and the potential data from this system can complement the data from a national repository for health care associated infections.

Strong integrated surveillance systems are needed to provide a comprehensive picture of AMR in Canada. We are not starting from scratch. Through a collaborative effort with other organizations, IPAC Canada has established standardized surveillance case definitions for long-term care and has participated in the advancement of the establishment of standardized surveillance definitions for acute care and a commitment to continue to seek options for a pan-Canadian adoption of these definitions.

There is also a groundswell of interest and commitment from partner organizations to explore options using infrastructure that's currently available to support a pan-Canadian approach. These goals align and support the achievement of the goals defined in the government's federal framework.

Canada has been recognized as a world leader in many aspects of health, yet we lag behind many international jurisdictions in the development and implementation of a national approach to address AMR. Federal engagement with provincial and territorial partners at the ministerial and deputy ministerial levels is needed to establish a consistent national surveillance system, with nationally approved case definitions, that is adequately funded. We need support to make the data being collected better integrated and more useful for the people and professionals working to fight AMR on a daily basis.

Thank you.

The Chair: Thanks very much.

The picture you've all painted about this situation is amazing, and so little is heard about it.

Now we're going to our question period with seven-minute sessions, starting with Mr. Ayoub.

Mr. Ramez Ayoub (Thérèse-De Blainville, Lib.): Thank you, Mr. Chair.

I'm going to ask my questions in French.

[*Translation*]

I liked the presentations very much, as they really covered the entire situation.

I'm a neophyte in the medical field, but I am a Canadian who is concerned about the health of Canadians. As you talked about communication and education, I told myself that resistance to antimicrobials is a slow killer. It is a latent and invisible occurrence that still leads to suffering. Research shows that. You were saying that you had difficulty obtaining information. You have scientific data, but there is a lot of data to interpret.

Even though the Canadian Antimicrobial Resistance Surveillance System exists, how can we validate the improvements made over time to address the antibiotic resistance epidemic?

I don't know who can answer my question. I have seven minutes, but I would like to ask some other questions afterwards.

● (1615)

[*English*]

Madam Rose, you can start.

Ms. Suzanne Rhodenizer Rose: I think your question is a good one. We have a number of surveillance systems in place. I think there's an opportunity for Canada to use what already exists. There's good infrastructure that can be scalable and integrated, so that we are comparing the same thing across the board. With the right analytics, assessment, monitoring, and trending of the data that's coming in, you can actually see, at a regional, local, or pan-Canadian level, how we are doing, based on the rates of AMR and health care associated infections.

Mr. Ramez Ayoub: Where is the trigger? Where do we need to improve ourselves? Where do we need to improve the teamwork?

Ms. Jennifer Happe (Officer and Director, Infection Prevention and Control Canada): Thank you for the question.

The Government of Canada has put together a pan-Canadian framework of action that addressed four core competencies. Beyond surveillance, it also includes infection prevention and control, stewardship and.... I've drawn a blank on the fourth one all of a sudden.

Ms. Suzanne Rhodenizer Rose: Research and innovation.

Ms. Jennifer Happe: Thank you. Research and innovation. How could I forget that?

Mr. Ramez Ayoub: Funding.

Ms. Jennifer Happe: Yes. It's really through those four core competencies that you're going to address the core of the problem.

Dr. Andrew Morris: Your question is a good one, but I'll point out that the Montreal Canadiens, the Ottawa Senators, and the Toronto Maple Leafs have more analytics in their organizations and more reliable data than we have in our whole country on AMR. If we can figure out how much puck time each player has, and their analysts can figure out how to optimize that, then surely we can identify and learn how to optimize antimicrobial resistance in Canada.

[*Translation*]

Mr. Ramez Ayoub: What you are saying is interesting. I was just wondering whether too many organizations were conducting research at the same time without sharing the gathered information.

You have a lot of requests for information on care and funding, but I feel that stakeholders are working in silos and have difficulty communicating.

How could the discussions and information sharing be improved and progress be monitored?

Dr. Andrew Morris: That's very true.

[*English*]

You are exactly correct. It needs to be coordinated. There is so little money available for this topic. I pointed out to you how it is a fraction of what some other areas of health care are afforded, and there's no coordination. We need national coordination that's participated in by the various sectors on a national and federal level, as well as on provincial and territorial levels. It needs to be coordinated. There needs to be an infrastructure to coordinate it.

[*Translation*]

Mr. Ramez Ayoub: Thank you.

Ms. Rhodenizer Rose, go ahead.

[*English*]

Ms. Suzanne Rhodenizer Rose: Recently, IPAC Canada has partnered with a number of other national organizations, such as the Public Health Agency of Canada, the Canadian Institute for Health Information, and CPSI, which is the Canadian Patient Safety Institute. We started out with one day of information sharing around how we currently collect data on health care associated infections and antimicrobial-resistant organisms, and there was a bunch of back and forth over a period of months about whose data was more accurate, because everybody is collecting it differently and using different definitions and different data collection methodologies.

At the end of it, just as recently as last week, we all agreed that we all have pieces of the puzzle that are strengths. If we can collaborate more and use the infrastructure and the resources that currently exist —that's not to say they will be adequate, and an infusion of funding would be required—we do have a lot of good work going on. It's just a matter of bringing those disparate pieces together.

● (1620)

Mr. Ramez Ayoub: Thank you for the answer.

I have one more question, maybe for Madam Levinson.

You told us that 30% of tests are "*superflu*", as we say in French. They are not accurate.

[*Translation*]

A lot of money could be saved by the government, although more funding is being requested. I am thinking of pharmacare, for example. It seems that more money would be saved if there was a Canada-wide action plan.

I was surprised—and not surprised, at the same time, as this is the reality—to hear that physicians prescribed medication just to reassure people. I am wondering if people are looking for a temporary placebo effect or just want things to be easier. Doctors know what the situation is, but they still do these things. They need to be educated.

How can we address this issue? What is the solution?

[*English*]

Dr. Wendy Levinson: If we just step back in the broader context, there are many reasons why doctors over-order both prescriptions and tests. Sometimes patients want them, and that is particularly true on the antibiotic side in the outpatient sector.

Sometimes it's just that it takes longer to explain. If you come in distressed, you want an antibiotic because you want to get back to work, and you say to the doctor, "Dr. Morris, I just want a script and then I'll get out of your office", he thinks to himself, "Am I going to spend the time explaining to the patient why he doesn't need it or is it just quicker, and am I going to make him happier?" It's easier to do it.

Also, sometimes doctors over-prescribe because they're worried about being sued, so they're trying to cover everything and be thorough. In—

Mr. Ramez Ayoub: What is the answer? I know that, but what would be the solution?

Dr. Wendy Levinson: There's no magic bullet. As you're hearing, this is a complicated problem.

There are some things that need to be done at a policy level and through surveillance and all the things you're hearing about. What we think also is that you have to engage health care professionals in this dialogue with their patients, because in the outpatient setting where a lot of antibiotics are prescribed, it's that one on one.... These higher-level things are needed, but it's also about engaging the profession.

Let me give you an example. If a family doctor is confronted with a patient who wants antibiotics, let's make their job easier for them. Let's give them tools so that the conversation is simpler. One example is prescriptions where you don't get the antibiotics. The prescription would say, "Take Aspirin, fluids, and rest, and in *x* number of days"—which the doctor fills in—"you can get this prescription if you're not better." In those studies, it's only 30% of the prescriptions they had filled, because the cold went away in three days. That makes it easier for a doctor.

We have to engage the profession in trying to fix this problem, in addition—not exclusively—to these more policy-related.... Also, educate the public, because if the public thinks there is no harm in it, they'll just take the drugs. They are going to ask for them. If they understood that there might be harm to them or to their child, they would be less likely to ask for them.

The Chair: Thanks very much.

Now we go to Mr. Webber.

Mr. Len Webber (Calgary Confederation, CPC): Thank you, Mr. Chair.

Thank you to our presenters. Your presentations were very interesting.

Dr. Keynan, you talked about some of these conferences you've held and attended, with AMR at the forefront. You talked about stakeholder meetings, stewardship programs, and case studies in particular.

You mentioned that Alberta is doing well at documenting strategies around case studies. I think I was one of those case studies. About three years ago, I went to hell and back. It started out as an evening of shaking many hands, as a politician, and I ask my colleagues to please listen closely and learn from this, because it is a very dangerous profession, politics, with a lot of handshaking.

● (1625)

Mr. Ramez Ayoub: Especially in the House.

Mr. Len Webber: Yes.

I had a paper cut, which ended in an infectious bacterial blood infection, later a bone infection, which led to about two months of antibiotic use through a pump, days in the hospital—all from shaking hands.

First of all, I ended up in the infectious disease program at the University of Calgary. The doctor there started out with a small.... There are different potencies with regard to antibiotics. Is that correct, Dr. Morris? I started out with a weak antibiotic, so the doctor knew not to hit me hard because of his knowledge, I guess, of AMR.

It led to increasing the dosage, to the point where they used the most potent antibiotic to alleviate this problem, after two months. Could that not have been alleviated sooner if they had hit me hard right at the start? I would not have had to go through two months of hell.

Dr. Andrew Morris: You were addressing that to Dr. Keynan.

Dr. Yoav Keynan: With regard to addressing infections, no one in this room is saying that antibiotics should not be used. They should be used when appropriate. You start with the right antibiotics and you try to target. The problem becomes complicated in the presence of antimicrobial resistance.

Part of your work then becomes guessing, and that's part of the problem. The other thing is the absence of guidelines that tell you this is an individual who has this kind of infection and this is an appropriate start of antibiotics, versus this individual doesn't need antibiotics because this is a viral infection.

That would address the previous questions on how you explain to the patient and the family why you're avoiding the antibiotic in this case versus using the heavy guns in another case.

It's a combination, and there's no simple answer. I don't know enough details about your particular case. There are ways where guidelines can help us in making sure that patients who need the antibiotics get them immediately, without delay. However, the others who do not are avoiding the antimicrobial use that is unnecessary.

The problem is that there is significant collateral damage. Using broad spectrum antibiotics is not only acting on the patient who is receiving the antibiotic, but it's acting on the hospital environment. These organisms travel between patients and that's why we need to hit them early and hard, but we need to know when to narrow it down.

There are very good case studies of programs that you alluded to in Alberta, and in Mount Sinai. There is expertise, but that is available in patches and does not cover the entire country.

Mr. Len Webber: Do you see any progress in what you're doing with respect to all these stakeholder meetings and such? Do you see doctors coming around in Canada, knowing more about AMR?

Dr. Yoav Keynan: For me personally, and for the NCCID, the biggest revelation was the fact that public health physicians, the public officers of health of different jurisdictions, did not see antimicrobial stewardship or resistance as part.... They have millions of problems on their desks that are related to multiple health concerns. Antimicrobial resistance was a threat that looked like something that is removed and not present.

Engaging them in the conversation has been very gratifying, because I think we now have champions. We have people who are interested. It's a matter of making the information available and finding more champions in additional jurisdictions. For that, a national centre that coordinates those efforts and copies those success stories.... We don't need to recreate the wheel for every region. We need to use the expertise available in centres of excellence.

In order for that to happen, we need sustainable funding, so those activities will be—

● (1630)

Mr. Len Webber: Not only for doctors, but I think that Canadians need to know more about AMR as well. I think a lot of us here had no idea of this issue until the committee brought it up to study it.

How knowledgeable are Canadians?

Dr. Levinson.

Dr. Wendy Levinson: First of all, I think most people are more worried about their own infection, and this might seem theoretical to them, bugs that are resistant somewhere in the hospital. The research shows that you have to actually have people understand the risks to themselves. If people understand that antibiotics can cause bad skin reactions or allergies.... They're not benign. You don't want it when you don't need it. You want it when you need it.

I think there are a lot of misconceptions because people think treatment is better than no treatment, and we don't really explain risk to patients very well. It's just sort of not talked about in the doctor-patient conversation. It's sometimes hard to explain risk because risk isn't just black and white. It's a relative risk. It's a marginal benefit or a marginal risk. These are statistical concepts that are better explained with decision aids and visuals, and we lack a lot of that, so people don't really understand risk very well.

The Chair: Thanks very much.

Ms. Sansoucy, welcome.

[*Translation*]

Ms. Brigitte Sansoucy (Saint-Hyacinthe—Bagot, NDP): Thank you, Mr. Chair.

I want to thank the witnesses for contributing to the committee's work.

My first question is for you, Dr. Levinson. In a *Huffington Post* article published in 2016, you said the following:

> We need to change doctors' practices to align with best practice by getting them to stop using various interventions that are not supported by evidence. And we need patients to consider that tests and treatments may sometimes not be necessary and may have potential risks and side-effects.

You said the same thing today.

In your opinion, if we had a national directive and an evidence-based form accompanied by decision-making tools for prescribers, would it help us reach your objectives?

[*English*]

Dr. Wendy Levinson: There are a lot of guidelines in many specialties. You've seen how doctors and societies produce guidelines, but they often address what we should do and not what we shouldn't do. They very rarely tell you what to stop. Think of all the older patients you know who are on a zillion drugs. What happens is that they go into their doctor's office, and the next specialist adds another drug, but people rarely say, “Let's look at whether you're on too many drugs.” Stopping things is not embedded as well in our guidelines.

We think if specialists themselves look at their practices and ask themselves about the common things they do where evidence shows they might do more harm than good and start to articulate that... because we haven't really as a profession articulated what we overuse. Twenty of our societies of the 60 that are engaged—and infectious disease is definitely one of them that's been working with us—have lists that include antibiotics. A lot of them have things around opioids, the other public health issue that you're certainly worried about. There are many reasons that overusing test and treatment gets baked in, so we need to engage the profession, I think, in trying to correct that problem because it's been around for a really long time without being addressed.

[*Translation*]

Ms. Brigitte Sansoucy: You said that your approach was used in a number of countries. The World Health Organization has a global action plan to address antimicrobial resistance. As a member state, what kind of a responsibility does Canada have in terms of that global action plan? Do you know?

[*English*]

Dr. Wendy Levinson: I think probably some of the other people know the World Health Organization work better than I do.

[*Translation*]

Ms. Brigitte Sansoucy: Okay.

[*English*]

Dr. Andrew Morris: I can start. Our commitments are similar to what was outlined in the pan-Canadian framework, so we have responsibilities for surveillance, and we have responsibilities for antimicrobial stewardship and infection prevention and control. We equally have responsibilities to develop policies that support public awareness and change, and the pan-Canadian framework supports research and innovation along with that.

Because there are low-income and middle-income countries in addition to high-income countries in the United Nations and WHO agreements, the bar is actually relatively low. I can tell you that there are many countries, including the U.S., the United Kingdom, Australia, Germany, the Netherlands, Scandinavian countries, etc., that are putting in substantially more relative investment than Canada is, and have already started significant work and put in significant investments. In the U.S. alone, there's a presidential advisory committee on AMR with important national leaders getting together and advising on where investments should go. We don't have the investments to advise our leaders on where it should go.

● (1635)

[*Translation*]

Ms. Brigitte Sansoucy: Thank you. I will continue with a few questions.

Mr. Morris, in a CBC News article published in July, 2017, you said that, for quite some time, doctors have been telling patients to take antibiotics over a long period without scientific data to support their recommendation.

Here is what you said:

> In general, we've always thought that a little bit longer is a little bit better. I would say that the conventional thinking—certainly what's been spread around for a long time—is that if you stop your [antibiotics] course too short you're going to help breed resistance. Resistance primarily emerges when bacteria are exposed to antibiotics. So the longer bacteria are exposed to antibiotics, the greater the risk of resistance developing.

Do you think that traditional thinking, which has been propagated on antimicrobial resistance, exacerbates the problem it is trying to solve?

[*English*]

Dr. Andrew Morris: Absolutely. That conventional wisdom is born out of misunderstanding, even of statements originally made by Alexander Fleming when he received his Nobel Prize, and from experiences with management of tuberculosis. They are not grounded in fact. Treating longer for most infections only exposes the patients to more harm, increases the likelihood of drug-resistant infections, and almost certainly doesn't give any benefit.

The reality is that, as I said in my presentation, the main two elements that you need for antibiotic resistance are bacteria and antibiotics. The more antibiotics, the more antibiotic resistance you get.

[*Translation*]

Ms. Brigitte Sansoucy: You made various recommendations in your presentation.

How can we ensure that doctors who prescribe antibiotics have quick access to the most up-to-date evidence on antimicrobial resistance?

[*English*]

Dr. Andrew Morris: I think it's important that we have a system in place to allow that to happen. We need a centralized database, a centralized repository of the information. We need to make it readily understandable, so it has to be easy to digest. Things like infographics are very helpful. Much like when I alluded to the sports teams with their analytics, those analytics are easily understood by people who don't have training in statistics. We need to have complex data that is then analyzed and then churned out for prescribers—and the public, to be honest—and policy-makers so that it's easily understood. Really, the only way to do that is to have centralized data and to have investments in that data.

[*Translation*]

Ms. Brigitte Sansoucy: Thank you.

[*English*]

The Chair: Mr. Bratina, go ahead.

Mr. Bob Bratina (Hamilton East—Stoney Creek, Lib.): Thank you.

I'm from Hamilton. McMaster University has put a lot of research into this field. I was pleased that we have received research grants, but when I was participating in the awarding of the grants, I found out that there were two of 16 going to McMaster. I just looked up the release. They work closely with the researchers from the University of British Columbia, Simon Fraser, Dalhousie, developing software and database systems, etc. They weren't really large amounts of money.

Would it be better to find one or two centres rather than trying to distribute the money among 15 or 16? Would anyone comment on that?

● (1640)

Ms. Suzanne Rhodenizer Rose: I think it's important to have one central repository, with everyone collecting data using the same methodology and the same case definitions. You'll find different epidemiological patterns based on where you are in the country. We know, for example, in the west there were higher incidents of antimicrobial resistance way back when with MRSA, for example. Moving across to the east, those rates were lower. There are differences across the country in rates.

By having a standardized set of case definitions, where it's funnelled up to one central repository where that information can be distilled down so that it is usable by clinicians and shared broadly across the country, we're able to benchmark our own individual locations much better.

Dr. Andrew Morris: I would just add that I totally agree with everything that was said. I think one of the dangers of having it just centrally, though, without having a true network—to disclose, I'm at the moment working on developing a network across the country to do this very thing—is that you lack some of the elements that Dr. Levinson was talking about in terms of having local engagement. I think it's really important to have engagement throughout the country so that it's locally relevant. It has to also address various marginalized populations. The indigenous community needs a stake in this as well.

Those things I think are all really important, but certainly someone has to have responsibility for coordinating that. So I would agree with that.

Dr. Wendy Levinson: I would just add another point, though. All of this is true. There are also certain research issues where we might want to have our experts around the country. For example, we might want social scientists to help us figure out, based on behavioural economics and social science, the best way to motivate doctors to make these changes, or the best way to present evidence. We might have these centres managing the epidemiology and the surveillance, but we might want to have researchers help to answer questions that would help us make the change better.

Those might be some of the kinds of grants we would still want.

Mr. Bob Bratina: Thank you.

My next question is about immune systems and general wellness. I was an older high-mileage marathon runner, and I ran with a lot of medical people. One of the things we all did was keep running diaries, which also ended up being health diaries. For marathon runners, typically 30% of a marathon field will have a respiratory infection within two days after a marathon. We were told to be careful about taking too many remedies, because if you get a respiratory issue, it will go away. Sure enough, the diary shows that.

In terms of medical delivery, should we be spending more time on bolstering the immune system and general wellness in addition to working with the antibiotic problem?

Dr. Yoav Keynan: That's a complex question. I don't know that I have an answer to it. Part of a healthy and balanced immune system is maintaining the normal microbiome, whatever the normal microbiome is, and exposure to antimicrobials has an effect on that. The disappearance of the natural protection provided by the microbiome causes immune dysfunction and potentially more susceptibility to other infections. Actually, by prescribing antimicrobials only when they are needed, it has the effect of boosting that.

There are additional methods as well that I....

Mr. Bob Bratina: Okay. I have another question.

I led a medical delegation to the city of Qingdao in China in January of this year. We were looking at a very large complex that they're building in that city. It was interesting to discover the extent to which traditional medicines have been integrated into the medical system in China. Is there anything to be learned from that in terms of the way they treat infections, often with herbal remedies that have existed from time immemorial?

● (1645)

Dr. Andrew Morris: Is there a potential benefit? I think the answer most people would say is “yes”. I think all of us have already alluded to the fact, though, that we don't have enough investment in the basic elements of public health infrastructure, the things that will prevent infections—hand hygiene, good environment, not overcrowding, sanitation, and those elements—as well as surveillance and understanding of what our problems are.

I think in the interest of drug development and cures, there absolutely are benefits. I think most investigators looking into cures, whether they be in industry or academia, have also started looking at alternative and traditional medicines. I think that's just a different avenue. That's part of the research and innovation aspect of our pan-Canadian framework.

Mr. Bob Bratina: Do you have any comments on the proliferation of disinfectants—you know, the little hand things that are all over the place—and how they relate to the general issue?

Dr. Andrew Morris: I will let our IPAC Canada colleagues answer.

Ms. Jennifer Happe: To date, there's no evidence that bacteria become resistant from the alcohol, so at the moment, it really does benefit more than harm. There's really sound evidence to show that the practice of good hand hygiene can have a significant impact on the spread of micro-organisms, so at the moment, it's a very cheap, but very powerful, solution.

The Chair: Be really quick, please. You're running out of time.

Mr. Bob Bratina: It's interesting to me that the real problem seems to be communication and, in the age of communication, that doctors and patients don't have enough information.

Thank you.

The Chair: Ms. Gladu, and I owe you an extra minute from the very first round.

Ms. Marilyn Gladu (Sarnia—Lambton, CPC): Oh, very good.

As I understand it, the World Health Organization has this plan that involves these pillars: surveillance, infection prevention, stewardship, and research. Have they agreed on an antibiotic protocol, that is, which ones will be used first to attack, or do we have situations where one country is overusing a certain antibiotic and developing resistant bacteria there, and then, of course, those people are getting on planes and flying over here where a different antibiotic is being used?

Dr. Andrew Morris: First of all, it's not a feasible thing to have a universal protocol because bacteria and their resistance differ internationally. There's certainly a hope that eventually we'll have an acceptable standard policy for what settings they can be used in so that they should only be used for humans or animals that have documented infection, or where the use of antibiotics for prevention is of benefit, and that they should be prescribed by a health care professional. I think, as a starting point, we need to get to that stage because you can go to the market in some developing countries and just choose by colour, shape, and size which antibiotics you want.

It's important to Canadians that we advocate for wise use across the country. For most of the drug-resistant infections that we have in Canada, the strains originated elsewhere, but some did not. We even have some strains that we're proud to call Canadian, but many have come from elsewhere as well.

Ms. Marilyn Gladu: In terms of Canada, is it just an issue of educating physicians and the public, or is there any incentive for doctors to prescribe one antibiotic or another?

Dr. Andrew Morris: I'll start that at least.

Education is really important, but we know in health care that education alone doesn't work. In terms of what we refer to as implementation science, it is probably one of the weakest interventions we can have. We need governance and policy. We need best practices. We need to have force functions. We need to understand, as Dr. Levinson mentioned, what behavioural economists and other people who know how to change behaviour know already. We need to put systems in place to make it very easy to do the right thing. Education alone is not going to make much of a difference.

● (1650)

Dr. Wendy Levinson: I'll just add to that.

There is a variety of things that we do know work that are pretty simple to do, like audit and feedback. If you show me that I'm prescribing twice as much as my colleague for similar patients, I'll think, "Wow, I'd better change that." There are some very simple things, but we do lack the infrastructure to do those things.

Ms. Marilyn Gladu: That's the next question. How much money do we need for the infrastructure and research that's needed? Do we know that?

Dr. Andrew Morris: A hundred million dollars.

A voice: Are you serious?

Ms. Marilyn Gladu: A hundred million dollars. Okay.

Ms. Rose.

Ms. Suzanne Rhodenizer Rose: I don't actually know the amount, but I do know there are pre-existing platforms in infrastructure that we can build upon and leverage so that we're not going out and spending $25 million on a database or a national repository. We can pull and leverage what's already pre-existing.

Ms. Marilyn Gladu: Excellent.

Dr. Andrew Morris: If I could just add.... There was a comment about whether I'm serious. I'm dead serious. We use well over a billion dollars of antimicrobials. We spend billions of dollars isolating patients and doing things to prevent spread. With $100 million, we'll reap that reward in spades.

Ms. Marilyn Gladu: Excellent.

I liked your comment about the Naylor report. I used to be the science critic, so I've actually read the 289-page Naylor report. Which parts of that do you think need to be implemented to assist with AMR?

Dr. Andrew Morris: That's a great question.

There are several aspects to the Naylor report. Certainly science that is directed for the sake of science is really important. A key emphasis of the Naylor report is that we need to go back and just embrace science, and have investigator-initiated science that is not necessarily goal-oriented. I think that's an important element of it.

We also need to be able to invest in young investigators and mid-career investigators. One of the things that the Naylor report pointed out is how we have this funnelling of researchers and it's very thin for young and mid-career investigators.

Very few trainees want to get into the field of AMR because there are no dollars in it. If I were to choose an area of science that I wanted to publish on, I could choose AMR, where I might have three or four journals to publish in and there may be one granting agency in the country where I can get dollars, or I could choose cancer or heart disease where I may have 10 granting agencies and maybe 100 different journals that I could publish in.

That investment to foster research and trainees in the area, from the basics of science to the more complex aspects that involve social sciences, data sciences, and clinical sciences, I think is really important.

Dr. Wendy Levinson: If I can add one quick thing, I thought a really important part of the Naylor report was about fostering innovation in general, because I think we have a pretty stagnant health care system and we don't innovate very easily in our health care delivery.

I think that would infuse creativity, again from the workforce, which I think we need to harness.

Ms. Marilyn Gladu: Do I still have time?

The Chair: You have time for one more question.

Ms. Marilyn Gladu: Oh, good.

The question is about Canada's ability to develop new antibiotics. Is that a possibility, and would there be research dollars required for that?

Dr. Andrew Morris: The best estimates come from a U.S. think tank, that the average cost for bringing a drug to market is about $2 billion for one drug.

When you ask me the price tag of tackling AMR with the pillars that we've been discussing, I gave it substantially less than that. We need drug solutions. We absolutely need new drugs, but if you look at where you're going to get the best bang for your buck, it ain't gonna be in drug solutions.

Ms. Marilyn Gladu: Thank you.

Dr. Yoav Keynan: The drug solutions are also temporary and are never going to be able to keep up with the fundamentals of the components of the programs that we alluded to.

Ms. Marilyn Gladu: Thank you, Chair.

The Chair: Thanks very much.

Dr. Eyolfson.

Mr. Doug Eyolfson (Charleswood—St. James—Assiniboia—Headingley, Lib.): Thank you very much.

Welcome back.

My questions are more of a clinical nature. Those who have been here before know that I was a practising emergency doctor for about 20 years.

There are certain things that I saw in my practice. Certainly when I was trained, we were taught that with an infection to use the most basic one that would work, because you don't want to be fostering resistance to the more advanced antibiotics. However, we would notice very glossy ads in medical journals for more advanced antibiotics, and then you'd start seeing people showing up on these.

When Amoxil was still first line for otitis media or ear infection in a child, we were occasionally seeing kids coming into emergency who had been put on Ceclor, which I guess would be the equivalent of using a baseball bat when all they needed was a toothpick.

Have you found any undue influence of advertising to physicians in their antibiotic choices?

● (1655)

Dr. Yoav Keynan: I don't think it's as big an issue as it was years ago, because there's no pipeline and no new antibiotics that are making a profit for a pharmaceutical company. The investment in development of new antimicrobials has dropped.

Mr. Doug Eyolfson: Okay, thank you.

Dr. Levinson, you talked briefly about how some physicians would say they didn't want to get yelled at by the patient, or they were worried about getting sued—that sort of thing. I remember some family doctors I talked to when I was a medical student who would say that if they didn't give it to them, the parent would take their kid to another doctor, and then they would complain that they saw two doctors.

In regard to the medical legal situation, in talking to my American colleagues, I know theirs is a much different medical legal environment. Americans are much more likely to sue their doctors than Canadians are.

Have there been any trends—and, again, I know it may be hard to compare because they've been collecting the data better in the States—in American versus Canadian practices? Has the medical legal environment changed?

Dr. Wendy Levinson: It's interesting. I'll handle that, because I've done some research personally on the relationship of communication to medical malpractice. I studied the attitudes of U.S. physicians versus those of Canadian physicians, and Canadian physicians grossly overestimate their risk of being sued. It's such a bad thing for a doctor that we all think it's very likely to happen when it's really.... They still operate as though it's a big driving force, even though it's actually pretty rare in Canada compared to the situation for American physicians.

We've talked a lot to the CMPA, the Canadian Medical Protective Association, about trying to work with physicians to stop doing things. They worry they'll be sued more if they don't do these things, such as prescribing when patients want them to. The CMPA actually thinks that is very unlikely, especially if we work through a consensus among doctors about what good practice means.

Mr. Doug Eyolfson: Thank you.

Dr. Andrew Morris: I'd like to add some data on that. I happen to have in front of me a communication from the CMPA. This is a year old now, but in the past five years, there were only 150 cases in all of Canada that the CMPA received in which antibiotic use was ever discussed, and essentially none of them were related to underuse. If anything, they were related to antibiotic-related harm.

Mr. Doug Eyolfson: That's very good to know. I think more doctors need to know that.

This would be a fundamental systematic change but if there were standards in prescription writing such that in addition to what you're prescribing you would prescribe the indication for it, then this could be double-checked by the pharmacist. If the pharmacist received this "indication: ear infection" and again it was Ceclor, then the pharmacist could double-check it and call the doctor and ask, "Are you sure you want to do this?" I had a hospital-based practice, and in hospitals this would happen all the time. It was a teaching hospital so there were in-hospital pharmacists who would do that quite regularly. They would ask, "Are you sure this is the right drug? We've noticed a local resistance pattern and we think that this is better." Would it be helpful if we were to have a prescription monitoring program or prescription writing program for the outpatient setting?

Dr. Wendy Levinson: There are a lot of studies looking at how to change physician behaviour. Earlier I mentioned audit and feedback, to tell you how you perform compared to your neighbour. Another one is asking physicians to check off why they're prescribing that particular drug and what the indication is. That has been used quite successfully in a variety of situations to drop ordering, because as soon as you have to say why and what the indications are, you tend to be a bit more judicious. It is one strategy, but there are a host of strategies. This again is about how we can motivate change.

● (1700)

Mr. Doug Eyolfson: That's my time. Thank you very much.

The Chair: Mr. Van Kesteren.

Mr. Dave Van Kesteren (Chatham-Kent—Leamington, CPC): Thank you. This is fascinating.

I have to tell you, though, I thought I was confused when you started. It's kind of like one of those roller coaster rides when you think you've got it, and then all of a sudden you'll say something else. That's been fortified by what Dr. Eyolfson has said as well. The situation we're in today is that.... Let's just say that when we talk about educating the public, does this complicate the doctor-patient relationship? Let's face it. Most people now go in to see the doctor and they've looked on the Internet and they have it all figured out. Correct me if I'm wrong, but it appears to me that this confuses even doctors, this whole issue of antibiotics. Am I right?

Dr. Andrew Morris: I think you are. It is a complex issue, which is born from a very young age, because all physicians were children at one point. All of us have a love affair with antibiotics. We love antibiotics. We're told as children that if we don't finish them, we're going to get sick and that no matter how bad they taste, we better take them. You get this emotional attachment and we're all in love with antibiotics. Everything all of us have been talking about goes against our emotional instincts around antibiotics. Then when you try to pair that with the education that most of us had earlier on in our training, which thankfully is starting to change, but it's only just starting to change, it makes it very difficult.

The problem with AMR is that as time has gone on, this problem has grown dramatically. As I said, when I trained, you only needed to know one kind of drug-resistant problem. Now there are a whole bunch of them. They're complicated. They don't really make sense. They have acronyms that aren't relevant to the prescriber. It's very difficult to communicate, and there are no reliable guidelines or centralized information that's easy to digest.

Mr. Dave Van Kesteren: So you're telling us that what in essence has to happen is the public has to be educated, but before that happens, doctors have to be properly trained. Is that correct?

Dr. Andrew Morris: I think so.

Dr. Wendy Levinson: I think there are some communication skills that are really fundamental, too, because often physicians are trying to please the patient, but they don't ask the question, "What are you most fearful of? What are you most worried about? What do you think this antibiotic will do for you?" "Well, if I get that, my kid won't cry tonight, and I will be able to get back to work tomorrow."

If you understand and ask those questions, then you can reassure them and educate them, "I understand why you're worried, but if I were you, I wouldn't want the risk of my kid having an antibiotic reaction, because the earache is going to get better anyhow."

Some of it is the knowledge, and some of it is how we work with patients to simply explain things.

Mr. Dave Van Kesteren: Mr. Morris, you're saying that you need $100 million basically to gather the information. I don't know how much time I have, but I served on the finance committee for years. I found, at least when we were in government, we used to like these little projects and stuff like this. The biggest problem we had, or the biggest problem the medical profession had, is that they really had poor representation. You don't have time to go out there, talk to politicians, and do the necessary work to get that support.

I think this is a marvellous suggestion. It just makes sense, because just in this short conversation, it's obvious that this is a very complicated and confusing issue, and there needs to be some gathering of information and education right across the board. If that can be done for $100 million, that's the best money.

I would suggest that you put together a lobby group of some sort and start to lobby the government, because, as I said, when we were in government, we used to love these little $50 million, $100 million jobs, or something along those lines. I know Sinai had a number of projects like that.

Are you doing that?

Dr. Andrew Morris: I'm putting together a group. We're not allowed to ask for as much as $100 million, which is the problem, but we have no other opportunity. We have a broad-based group. IPAC Canada, NCCID, and Choosing Wisely are all involved in it. The most we're going to ask for is somewhere around $30 million, and we're competing for that money.

This committee needs to come to us and say, "Give us your best shot. Tell us how you're going to do this," and we will tell you. As Dr. Levinson said, this needs to be at least guided by groups, organizations, and individuals who know about this but have access to money. There isn't that money available, and we're not politicians.

● (1705)

Mr. Dave Van Kesteren: Can you do that? Can this committee ask you to put something together that—

Dr. Andrew Morris: Absolutely.

Mr. Dave Van Kesteren: I'm sure this is something we could all agree on.

Dr. Andrew Morris: You follow up with me. Somebody send something to me, Mr. Gagnon, and we will get it to you.

The Chair: Thanks very much.

Mr. McKinnon.

Mr. Ron McKinnon (Coquitlam—Port Coquitlam, Lib.): Thank you, Chair.

I'm going to take refuge in information systems. A lot of what I'm hearing is that we need this overarching coordination mechanism. We need data standards, and we need process standards. I'm going to touch on what Ms. Gladu mentioned as well, international experience.

This is not a problem local to Canada. It's a problem that exists around the world in all countries to some degree or other. Is there a country or some supernational or subnational group that does this really well, that has an organization that has processes and definitions in place that we could use here as best practices that would be a good starting point for us?

Ms. Suzanne Rhodenizer Rose: I think just coming from the perspective of surveillance, we already have some of that in Canada. I talked a little bit about the Canadian nosocomial infection surveillance program. They develop standardized case definitions that are used in a small pocket of tertiary care facilities across the country. There's an opportunity there to use those well-vetted, evidence-informed case definitions right across the country so all the provinces and territories in Canada are using the same definitions, and we're able to monitor and trend with a high degree of reliability what's going on in the various areas across the country.

Dr. Andrew Morris: I can add to that. The challenge in most jurisdictions is that there's a divide between research and public health. In most jurisdictions, whether it's in the European Union or in the U.S., there's no coordination between research and public health. This requires research, and it requires public health, and it requires them to be integrated.

There are many jurisdictions that do great surveillance in epidemiology, and there are some that do excellent research. Canada could be a leader here by integrating the research with infection prevention and control, antimicrobial stewardship and surveillance, and putting all those things together.

Scandinavian countries by far and away lead the rest of the world, but there are pockets of excellence in stewardship. In Australia, they have a National Centre for Antimicrobial Stewardship. The European CDC and the U.S. CDC are excellent for surveillance. The Dutch are amazing for stewardship. Research still remains the domain of Americans especially, but it's increasing in the U.K., and in the rest of Europe.

Mr. Ron McKinnon: So we could go to these various organizations and synthesize a new system based on their respective best practices, and that would be a world-leading standard.

Carrying on to what you said, Ms. Rose, with the existing system you talked about in Canada, if we were to build on that—I'm interested in the international perspective—is there interoperability between European systems in terms of exchanging data? In fact, is there any need, any value, in exchanging data with European or other systems?

Ms. Suzanne Rhodenizer Rose: From my perspective, yes, I think there is. I would defer to my clinician colleagues on looking at that.

I think there is opportunity in looking at antimicrobial-resistant trending across the country and also globally so that you can see what's happening in other areas and there is ability to have some predictability about what may come to our borders.

However, that's not exactly my area of expertise.

Dr. Wendy Levinson: The OECD quality effort that Canada is very involved in could be a source of information too. As I said, they do comparisons across the countries. They have consistent information, yearly, in their "Health at a Glance" report—Canada is part of that—looking at rates of antibiotic use and, among other things, a comparison. As I said, the Netherlands is a half of the use of antibiotics per capita to Canada.

● (1710)

Mr. Ron McKinnon: Does the World Health Organization provide any overarching definitions or support? It is a global organization.

Dr. Andrew Morris: They do provide definitions.

Mr. Ron McKinnon: Are they useful?

Dr. Andrew Morris: Well, that's a different question altogether. I think that the challenges of AMR differ, and the hurdles that countries need to overcome.

The WHO, as Dr. Tedros mentioned just yesterday, involves all countries. There are many countries around the world where access to antibiotics is a greater issue than choosing which one you're going to get.

We face different challenges than many other countries, so to rely on an internationally accepted definition for surveillance and other purposes may not be the best approach.

Mr. Ron McKinnon: Okay.

The Chair: Your time is up. Thank you very much.

Ms. Sansoucy.

[*Translation*]

Ms. Brigitte Sansoucy: Thank you.

Mr. Morris, you mentioned earlier that antimicrobial resistance was currently costing the system several hundred million dollars.

Do we really have data on the potential savings that could be made in the health care system with adequate intervention and the development of new methods compared with the current costs?

[*English*]

Dr. Andrew Morris: The challenge is a complex one.

I don't know how much you spend on your insurance, but the battle we're all dealing with on AMR is primarily one of insurance, because we know there has been a growth of resistance over time that is going unabated. What we're looking to do is try to stem that tide and invest for cost avoidance, I will say, because the expenditures of dealing with antibiotic resistance are going to be much greater down the road than they are today, especially if we don't do anything.

If we just estimate and we don't have reliable data.... Let's just say we're using $1 billion of antibiotics a year. Our best estimates are that 50% of antibiotics are unnecessary. Those are the best reliable estimates, somewhere between 30% and 50%. Even if you reduce it by 30%, we're talking about a $300-million savings. To be honest, $100 million is a relatively insignificant investment. That's only antibiotic costs. That has nothing to do with all the other investments or risks.

One of the hospitals I work in deals with cancer patients. Often, we now only have one antibiotic with which to treat them. We have patients with transplants and we're giving them novel antibiotics, or ones we really have no experience with, because we have no other choices for them. If we pass that stage, and often we do, we have no other choice.

You may be familiar with the case this past year where doctors at Toronto General had to remove a patient's lungs because there was no antibiotic solution for her. They had to take out the lungs, wait, put her on some other support until lungs were available, and then give her new hope for life.

On that reality that people are thinking about down the road, we're there today. This is not something that Canadians can afford to delay investing in. This committee and the government need to take action now to invest in this.

[*Translation*]

Ms. Brigitte Sansoucy: Earlier, you talked about the importance of funding research and said that developing a new drug costs $2 billion, but that it may not be the solution.

Is there development potential? You are in a better position than me to talk about that. Are there any ideas that could be developed, innovations to be made, other than the ones we are currently using?

[*English*]

Dr. Andrew Morris: You're from Quebec?

● (1715)

[*Translation*]

Ms. Brigitte Sansoucy: Yes.

[*English*]

Dr. Andrew Morris: In Quebec there's a tremendous industry in diagnostics. I personally have a dream that when a patient is being prescribed an antibiotic, they're being prescribed an antibiotic only when the doctor or whoever is prescribing knows that there's an infection and knows exactly what they're prescribing, right?

One of the problems we have is that doctors don't actually know if the patient has a bacterial infection, and even if they do, they don't know what organism they're treating. Diagnostics and choosing wisely the diagnostic tests would absolutely help in this effort. That kind of innovation is absolutely necessary.

On top of that, today we don't have all the technology available at the bedside but it's foreseeable, so at least then we should have the available data. We should be able to say, based on the patient's GPS coordinates, that we know what germs are circulating and their drug resistance. If we don't have a bedside test, we should be able to say what the best antibiotic is for this infection in this patient.

Those two things are foreseeable in the next five to 10 years, but it requires investment. It's investment that wouldn't require new drug development, but it does require investment in infrastructure for the data science and the research and innovation in, for example, the diagnostics industry.

The Chair: Okay. The time is up.

I don't know how we can thank you enough for the testimony you have given us. I often say that we have the best witnesses of any committee on the Hill, and you've certainly supported that today and ensured it.

The clerk has your information, Dr. Morris, so we'll be in touch with you about Mr. Van Kesteren's proposal. When you put that together, the more voices and the more organizations you can have in it, the better. Voices count here.

I want to tell you that you've already made a difference, because when I go to the doctor, I want an antibiotic—I don't care what's wrong with me. I'm not going to do that anymore, so you've already made progress. I bet 99% of the people in Canada don't know about this issue. That's a big part of the problem right there: public awareness. Surely we can help with that. We look forward to your presentation.

We still have several meetings to go on this subject, but you've added an awful lot to the study. I want to thank you very much on behalf of the entire committee.

Mr. Webber wants to say something.

Mr. Len Webber: It's very short.

Dr. Morris, who do we cut the cheque to for that $100 million?

Voices: Oh, oh!

Dr. Andrew Morris: To CANresist.

Mr. Len Webber: Okay.

The Chair: I wouldn't spend that money yet.

Voices: Oh, oh!

The Chair: Anyway, thanks very much on behalf of the committee. It's great testimony.

Mr. Ron McKinnon: May I have a quick follow-up question?

The Chair: Yes.

Mr. Ron McKinnon: On that $100 million, is that per year or over five years or...?

Dr. Andrew Morris: Let's say it's over five years.

Mr. Ron McKinnon: Thank you.

The Chair: Okay.

The meeting is adjourned.