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| Renée | Good morning, I’m just wanting to check – is our first speaker there, Dr. David Butler-Jones? |
| David | Hi there. |
| Renée | Hi. Good morning. I just wanted to confirm you were there. |
| David | I am here indeed. |
| Renée | Great! So, good morning to everyone. My name is Renée Barclay and I’m with the National Collaborating Centre for Infectious Diseases, and we’re a partner in AntibioticAwareness.ca. I’d like to thank you for joining us and welcome you to this webinar, which is presented as part of Antibiotic Awareness Week, which is this week. During this one hour session, we will hear from two Canadian experts in the field of anti-microbial resistance. We would like to suggest that you listen to the presentation on your computer speakers, however, if you need to, please feel free to listen by telephone using the toll-free number and code listed on the screen. If you are not a presenter, we suggest that you put your phone on mute so that other participants don’t hear you. The upcoming presentations will be 20 – 25 minutes in duration. During the presentations, we invite you to post questions by typing them in the box on the left corner of your screen. I would now like to introduce to you Dr. David Butler-Jones, who is the Chief Public Health Officer of the Public Health Agency of Canada. And he’s going to be presenting on AMR at the Public Health Agency of Canada. So thank you for joining us. And I’ll - |
| David | Well, thank you. It’s my pleasure, and to join you virtually if not in person, and I’ll just proceed through my deck and then we’ll see where we go from there. And certainly it’s, I’m the, my role is, I have a dual role, for those who don’t know me: I’m the Chief Public Health Officer for Canada, as well as being the Deputy Minister responsible for the Public Health Agency. So initially, Sir William Osler, who grew up in southern Ontario and taught in Canada and the U.S., probably one of the greater physicians that we’ve known, but, he would say to prevent disease, to relieve suffering, and to heal the sick, this is our work. And I don’t think he actually put that in that particular order by accident. It is first to be [incomp/foreground noises 2:20] illness, disease in the first place, able to provide compassionate and supportive care, and to be able to treat. In fact, much of our improvements in health over the last century have been largely either on the prevention side or our capacity to work with people and treatments – absolutely essential and important – but the greatest benefit is from fairly simple things like the appropriate use of antibiotics which then brings us to some of the current dilemma that we have.  So this is Antibiotic Awareness Week, and anti-microbial resistance actually is continuing to be a persistent challenge as we see new resistance to various antibiotics and the interface between the environment, the human population, the use of antibiotics in animals as well.  The basic, when I trained, I mean there was this view back in the ‘70s and the antibiotic era, this view somehow that we’d largely conquered infectious disease. And certainly, the great outbreaks over the past number of years have proven us, well, a little bit of hubris there.  And so, what we’re seeing, and that the basics still do matter, basic infection control. We saw, for example, that during H1, that the hospital outbreaks of Clostridium, the community in terms of outbreaks, infectious disease around food poisoning, we actually, *seemed* like we actually saw a decrease in that. And clearly, the basic hand-washing, avoiding others when we’re sick, better hygiene and cleanliness in institutions, et cetera, all of which contribute to cure infections in the first place and then our ability to treat them more effectively.  So why, why now? Well, they’re saying this is, there hasn’t been a fundamentally new class of antibiotics in a long time. Many sort of variations on a theme, but the reality is we have multiple resistant organisms – NDM1, et cetera. Our abilities to actually effectively treat become diminished, and we’re, if we get much further down this road, we risk getting in a bit of a pickle. If you look at rates of anti-microbial resistance around the world, again a great deal of variability. About 440 000 new cases of MDR – multidrug-resistant tuberculosis cases are recognized and there’s probably more than that, and that results in about 150 000 excess deaths. And so far, we’ve seen, for example, just with MDR-TB, that’s being reported in 64 countries to date, and it gets a little larger in consequence of partial or inadequate treatment. If you look at the impact of emerging infectious diseases, we recognize that the bulk of them actually come from our sister species, from animals, particularly the close proximity of domesticated animals and humans, the ability of some, most of very species specific, but the ability of some to actually cross the species barrier. And when they do and they’re successful, particularly when they can spread from person to person easily, then we have the prospect of a pandemic or a major epidemic, et cetera. And SARS, while it is an example of disease that probably many, many people have been exposed to, but cases in the hundreds resulting in dramatic impact in terms of people’s faith in the system pointed out challenges, in terms of how the system communicates, how it coordinates, how it works together, of how it addresses issues, et cetera. And the economic and social cost far, far in excess of the actual number of people affected, though clearly those affected by SARS and their families, et cetera, and the hospitals are very, very serious. But in the big scheme of things, the number of infections, the numbers of deaths, are very, very small. Whereas H1N1, much larger number of people affected, much larger numbers of deaths, et cetera in prematurely, and particularly in young people. And yet the view of it, the consequences of it are much reduced by the actions of, here in Canada and elsewhere. North America was hit first and hardest, and yet the ability to provide anti-viral treatment, the use of an effective vaccine that stopped the pandemic before Christmas where it continued in other countries and then resurfaced, for example, in Europe, in the last winter season.  So, dramatic in potential impact that has not just a specific impact in terms of the disease themselves but also economic and social impact as well.  So the Agency actually works around surveillance, the number of surveillance systems that track anti-microbial resistance and the use of antibiotics, et cetera. Province and territories, clearly it’s the deliverers of care, the managers of hospitals and institutions and public health in the community. Really, it is how the system is better connected and the data that we collect helps to inform the work. But ultimately it is back to that basic hygiene and practices and the appropriate use of antibiotics that fundamentally will make a difference. And if we’re not doing that at the local, either practitioner level or community level, no amount of surveillance will actually deal with it. It will just nicely document how things are getting worse.  So, this graph, again, is very complex, which is the nature of the relationship between the various diseases, the use of antibiotics – whether in humans or animals – the propensity or possibility for either cross-contamination or bacteria and viruses to adopt, or adapt, to the antibiotics or anti-microbials that were used.  The food system is clearly a key area, and when we look at the food chain, CPARS, which is the Canadian Integrated Program for Anti-Microbial Resistance, was established to really focus there. And so here, as you can see, as we monitor the presence of both animals and human population, plus collecting information on use on both animals and humans, the information collected then is integrated to better understand the exposure pathways and the roles that each sector can play.  The nice thing about food poisoning, as a ‘for instance’, is that it really requires several steps to break down. It’s not simply that the food is contaminated but it’s also that it could be that it is cross-contaminated, or it’s not cooked properly, or it’s not stored properly, et cetera. And then you have to have a susceptible person or animal who then eats it. So if at any point, and as long as we’re focussing at the multiple points, we have a much better chance of actually control food-borne infections, but also in focussing our efforts to reduce anti-microbial resistance as well.  So, additions to the collections of AMR data, CPARS also monitors the dispensation from pharmacies across Canada, then analysed, and then it’s made available nationally and provincially.  And as you can see, if we look here, we’re able to actually compare levels of consumption in Canada to European countries. And what this shows is that the level in Canada is similar to the level of Finland or the Czech Republic. And Canada’s oral anti-microbial consumption was almost twice the level of anti-microbial consumption reported in the Russian Federation.  So Canada well ranks about 14th out of the 31 countries by increasing the level of total antibiotic, or anti-microbial consumption, and ranked 28th in terms of the level of use of macrolides, lacosamides, streptogramins, et cetera. And 22nd for the level of consumption of quinilones. Largely used in Canada, the use of the fluoroquinolones family. And Tetracycline, we’re 18th, and 6th for Penicillin.  So here’s a way of actually comparing how we do. There are lots of reasons for it, and again, a number is just a number, and we know access cost, patterns of treatments, et cetera, all vary. But the point being, it’s another piece of information that allows us to better understand where we fit and where our potential issues are.  So if we look at methicillin-resistant staph, and we look over the years in terms of how things have changed, the surveillance network has grown, so part of it is we’re actually better at recognizing it, but there’s also clearly a true increase. And we’re seeing MRSA in communities - that’s particularly a challenge in the North, with infants and young children. Again, with the challenges around access to water and sanitation, et cetera, complicates matters further.  So VRE, again similarly, significant increase in infections and colonizations reported may be an issue, partly, as I said, enhanced cleaning, hospitals and institutions focussing more on identifying potential cases and sources, but it’s not simply that. It has to be also that we’re not necessarily doing a good job.  But ... we look at C. difficile, particularly the challenge over time, and the emergence of more virulent strains. While the rates have remained relatively constant, attributable mortality and severe outcomes has increased, and particularly in part, but particularly I think, because of the spread of the NAP1 strain. And as I said, when we were seeing, during H1 when we were all being much more obsessive – and maybe appropriately so in terms of infection control–we did not see the outbreaks that we’ve seen subsequently or before.  So here’s actually a very good example of where the integration of the information can actually be very useful and very practical in terms of outcome. So, in 2003 and -04, we’re seeing high levels of resistance to Ceftiofur observed in chicken E. Coli and human and chicken Salmonella Heidelberg in Quebec. The information was then shared with producers, which led to a voluntary withdrawal of the antibiotic which had been injected into eggs.  After the withdrawal of its use, as shown here, we produced a reduction in resistance to that in chicken E. Coli and both human and chicken S. Heidelberg. However, as of 2007, partial reinstitution of the use occurred and led to an increase of resistance to this bacteria as well.  So, it can work. But again, the importance of monitoring and recognizing how patterns change, and ultimately it has, and can have a direct impact.  So the next reel, we’re looking at NDM-1 and likely a first case of a Salmonella species, was likely acquired in India but detected in the U.S., was reported – an example of how easily the enzyme-resistance is moving between species and can be introduced into a food-borne pathogen, like Salmonella. So again, a bit of a worry moving forward.  In terms of preparedness, it’s important to note that our partnerships constitute bodies well outside of Canada, working on the AMR with the WHO, both for community hospital acquired and food-borne pathogens, as well as with the office of AMR and PAHO, the pan-American Health Organization, which is the regional affiliate of the WHO, and the Association of Medical Microbiology and Infectious Diseases.  It really is, it really does require a range of partnerships and focus, of broad expertise. Again, not just animal or human health expertise, but also an understanding of the interactions with the environment and how those could potentially, can impact as well.  So, this sort of brings us to the concept of one health. It’s not a separate discipline. It’s a way of ensuring that we’re thinking about the complexities, about the interface between animals, humans, and the ecosystem and the impacts of economics, both positively and negatively on all of that. It is, really it’s a way of ensuring, because, for example, in food-borne illness, if we just stick to thinking about food and not recognize that, for example, pigs ears being chewed by the pet dog. Or Salmonella in the pet turtles, or – or – or – or, any number of possibilities. Then if we’re not thinking of that whole of the environment in which we live, and who and what we interact with, then we risk missing these. And the same is true for understanding patterns of anti-microbial resistance and how we can actually prevent or mitigate that impact.  So, the Health Portfolio. And the Health Portfolio consists federally of the Public Health Agency as one department, Health Canada as another, and the CHR is the funding for health research, as well as a number of smaller agencies. Really, we play a role collectively in terms of the monitoring, focussing on the limitation and control of AMR. That includes surveillance, research, a number of areas there. And as the Agency itself is the lead department for Public Health, broadly, and in developing a coordinated approach working across governments, across sectors, et cetera, moving forward.  So there are a number of challenges and opportunities, sort of as they say, two sides to the coin, in terms of how we engage collectively, how as physicians in practice we prescribe, how veterinarians prescribe, how farmers who have access to drugs without veterinarians. What does that mean? How is that managed? The whole range of our interface internationally and with other organizations, the development and research around new antibiotics or mitigation of problems, moving forward.  So it really does require a broad approach and engagement of a range of organizations and stakeholders.  I just wanna sort of finalize my part of this talk with ... Sometimes, these things just seem so huge, whether we’re talking about the social determinants, whether we’re talking about the multiple levels of interface that relates to the topic of the day, whether we talk about economy more broadly, any number of things, sometimes it just seems overwhelming. And the point of this slide is just to say that there are ways, either as individuals or communities or organizations, departments, whatever – that we can play a role. And one way of parsing it out is as you see described here, in partnering in terms of who has a common interest and who can we work better together with than separately? Advocacy.  And it’s not about ‘boots in the streets’ per say, as much as bringing evidence to bear and understanding what the policy challenges are, and bringing evidence and advice that will help to address it at whatever level. Cheerleading is basically avoiding getting in the way, really is about recognizing that it does require a range of, these issues do require a range of expertise, a number of different organizations, disciplines, et cetera, to do it. And harping or trying to own it, et cetera, can be a challenge and really a major barrier.  It’s Samuel Johnson a couple hundred years ago who said, which I think is apt, “It’s amazing what you can accomplish when no one has to get the credit.”  Mitigation is an enabling, and enabling is what we do in terms of our own organizations, the way we develop programs, how we implement them, et cetera, that are facilitative to improving conditions. And the mitigation is what we often do best in the health care system, which is picking up the pieces afterwards, though obviously prevention is key because if we’re able to prevent things then we have fewer things to have to deal with. But we really need to have a balanced system from prevention through treatment, through care, and on.  So, the last slide, the last slide is from one of my favourite philosophers, Samuel Clemens or Mark Twain, who said, “Even when we’re on the right track, if we’re not moving, we will get run over.”  So, thank you very much. And I’ll stop there. |
| Renée | Okay. Thank you very much, Dr. Butler-Jones. We did have one question which, I’m not sure. I’ll just put it out there.   * Should we be reviewing our therapeutic substitution of Clarithromycin to Azithromycin, or might we increase resistance with that? |
| David | That’s a very practical and technical question that I don’t really have the expertise to answer. |
| Renée | Right. Okay, I just thought I’d put it out there. |
|  | Fair enough. These are all very practical examples. I mean, it’s interesting when you, as a ‘for instance’, we used to observe that whatever detail person would come through town, suddenly you’d see prescribing change and not always for the better. In other words, moving to 3rd or 4th generation antibiotics, when the 2nd generations still are quite adequate. So actually understanding resistance patterns in the community and what is most .. so the guidance documents around community acquired infection’s – first choice, second choice, et cetera – I think is important in constantly reviewing those and understanding at a regional level, you know, local Medical Officers, the Infectious Disease experts, and others, being able to identify changes in patterns and to provide good advice for primary care and hospital providers as well. One of the things that I found really useful when I was in practice, teaching Family Medicine and working with patients in hospitals, et cetera, was the hospital pharmacist sort of would review pharmacy-, plans and things, and periodically we would get a call, did you know that, you know, we have this other drug or antibiotic that at the moment works just as well but is less costly, et cetera, et cetera. So having that source of advice on an ongoing basis, I think, is extremely helpful because at least as a, both as a clinician and now, doing Public Health, there’s no way that I have the level of familiarity that, to know all the details that are necessarily appropriate for every situation. But anyways, sorry I can’t answer this specific question, but I think it’s a very important and practical one. |
| Renée | Right. Thank you very much. And if there’s anyone that has any questions, then you can continue to post them throughout this webinar and we can get those addressed as well.  But thank you very much for speaking, Dr. Butler-Jones. And we will, in that case, move on to our next presenter, who is Dr. Craig Stephen. He’s a professor at the University of Calgary and he is Director of the Center for Coastal Health. And I’m hoping he’s on the line – Dr. Stephen? |
| Craig | Yes, I’m here. |
| Renée | Great! I just wanted to make sure. We’re just loading up your presentation, and I think that the presentation we just heard from Dr. Butler-Jones is a nice segue into, I think, your presentation as well. So we look forward to hearing it. And I understand that you’re speaking on health promotion for appropriate use of veterinary drugs. So, thank you for giving a presentation today. |
| Craig | Oh, well you’re very welcome, and thanks for the invitation. And you’re a good diplomat – one way is to say that Dr. Butler nicely set up my talk, the other way is to say he usurped some of my ideas. So I’ll do some editing on the side and be more gracious that he set me up nicely, because I think you’ll see that some of the concepts that I present are very similar to what he presents.  And before I start I just want to give you a bit of a background on myself. I skimmed down the attendees list and I see a few familiar names, but others that I haven’t seen before. And so, I am a veterinarian.  I have my, my doctoral work, I did in Epidemiology, and I’ve done a lot of work in emerging infectious diseases. But I run a group called the Center for Coastal Health. It’s out in British Columbia, and we specialise in this thing that Dr. Butler-Jones talked about, ‘one health’, in other words, looking at how human, animal and environmental health interact and affect each other. And we’ve been doing this for, oh, about 16, 17 years now, before the days when we were worried about our various flus and our various SARS.  And so, a lot of what I’m gonna tell you today has come up from my experiences and perceptions dealing with a number of these zoonotic issues , but specifically about antimicrobial use. And what I want to present today is a challenge to the community of researchers and managers about thinking a new way to deal with appropriate antibiotic use in the veterinary or animal sector.  Now, my perspective is very ecological in my approach. A lot of my other colleagues tend to think about anti-microbial resistance in terms of microbiology, the particular bug, not necessarily the bug in its community, and as well as in terms of pharmacology.  The reason I bring up this slide about ecology is anti-microbial resistance management, to me, is very much like dealing with threatened and endangered species. On the one hand, we want to preserve and conserve those susceptible strains of pathogens; we need to think about how we do conservation ecology for those organisms. And then on the other hand, we want to get into the reverse of conservation ecology, which is the business of the extinction of the resistance strains.  And I think there’s much to be learned from the concepts of conservation biology and conservation ecology, one of which is the idea of the bacteriological niches, or the places where the bacteria thrive and survive. And the important thing that Dr. Butler-Jones brought out is for many of the important pathogens and many of the determinants of anti-microbial resistance, there is this sharing across borders, between the people, between the animals, and between environmental components.  This results in giving us a complex system. You saw, again, Dr. Butler-Jones, a very complex picture of how anti-microbials can move around.  And I just want to take one second to look at this one. I think there’s two important points that I want to make out of this sort of a slide.  The first is that without the dotted lines in between there’d be no connections. That sounds silly and that sounds obvious, but where that is an important issue is that ecology is all about studying the connections between things, and we don’t spend as much time thinking about how things interact and affect each other when we’re dealing with bio-medical issues like anti-microbial resistance.  The second issue certainly is that it is a multi-compartment issue and we can’t effectively separate off one component from another – yet most of our research funding, most of our disciplinary management, comes apart in isolated segments. Now, we are starting to improve in collaborative and interactive programs but it’s still not the norm.  The third issue is, what’s very important to remember is your risk perceptions vary by where you are in this web of interaction. This next slide is a generic modal of risk perceptions. And I remember earlier in my career, we did a number of risk assessments about pathogens and resistance, things moving back and forth between people and animals. And, you know, we always thought the outcome was to do the risk assessment, but really, the outcome is to deal with the risk behaviour.  And as you see by this slide, risk behaviour, what you do to manage your risk is really affected by your risk perception. And risk perception, in turn, is affected by a whole bunch of things, many of which are professional, sorry, personal attributes. Do you have an egocentric view? Do you work in a culture of safety and risk? Do you believe it’s controllable? Many of these individual and situational characteristics affect how much you’ll accept a risk and what you will do, the risk behaviour.  And in this case the risk behaviour is about the appropriate use of the anti-microbials. So the first major point here is I think it’s unrealistic to believe that everybody in that web of anti-microbial resistance will share the same risk acceptance, and therefore advocate for the same risk behaviour.  I was just lecturing to some students the other day in a class I teach called ‘Animals, Health and Society’, where we were talking about individual behaviour. And the students, of course, were perplexed by saying, you know, why don’t they just do the ‘right’ thing? And we have this naive view amongst the students that once we see the science, people accept the right thing. And I reflect back on a paper I read years ago about pollution, on environmental pollution. that claimed no science has ever stopped pollution. In the end, it’s always been the lawyer who’s decided that society won’t tolerate this.  So the purpose of this slide is to make us, to realize that appropriate use is a relative term. And the challenge with dealing with that relativity is, how do we in fact come down to an agreement on whose use or whose perceptions are appropriate?  One of the biggest challenges I find in zoonotic infections, whether it’s food-borne disease or whether it’s anti-microbial resistance, is the concept of attributable risk. Of all the cases of pathogen X resistant to drug Y, what proportion can be attributed back to actions in, let’s say, the animal sector or the fruit-crop sector. I think there’s very few people who would doubt there is connectivity, but in order to say what percentage of the risk comes from what parts of the components, I think we really lack a lot of the methodology to do that effectively. And therefore, we get into a problem of having an evidence-based argument for policy action and appropriate use.  I’ve been to many, many anti-microbial resistance meetings that have broken down into whether it’s the paediatrician or whether or it’s the veterinarian or whether it’s all these different sectors.  The second problem is, when we do look into that perception modal, even qualitatively, agreement on attributable risk is a very challenging thing to do because different players evaluate risks and benefits differently. So the tertiary care paediatrician who comes into my class to talk to the students certainly has a different perspective than the commercial poultry producer. Not a right perspective or a wrong perspective, but a different perspective based on where they’re at.  So our underlying hypothesis is that appropriate use in one compartment is gonna reduce the selection pressures on the bacteria, keep that bacterial ecology working in our favour. And I don’t think there’s anybody who, again, rejects this hypothesis. The challenge becomes, how do we move it, the agenda, forward?  So I talked about risk behaviour being about decisions and choices, and in this case, drug use choices. And there’s many different levels of choices.  For example, on the animal side, we have individual use choices. There’s nobody – I shouldn’t say nobody – there are very few people who’ll take their pet goldfish into the veterinarian for a culture and sensitivity. People with $20 000.00 carp might, but not for your average goldfish. So they option, for them, if they see a sick fish, and they have antibiotics available in a pet store, they’ll buy them cheaply. So there’s individual choices.  There’s group choices – for example, the Canadian Veterinarian Medical Association wants to preserve the autonomy of veterinarian to both prescribe and dispense, an action that has been rejected in some other countries in the world.  We make policy choices as a country – for example, we allow that Erythromycin to be available in a pet store for fish to use. The Veterinary Profession doesn’t like it, the Medical Profession doesn’t like it, but our policies, historically, have allowed such practices.  And there’s even consumer choices – what is the standard of food? Food quality, food safety, food production methods that consumers are willing to pay for? And this can make a huge difference. I mean, we’ve looked at the difference of things like Kentucky Fried Chicken and McDonald’s has had on animal welfare standards, when major consumers demand certain sorta productions, industry standards can change.  So there’s really three behavioural change questions that come about on anti-microbial use in animals. The first one is, well, what affects your decision to use antibiotics within the current Canadian economic and policy climate? A lot of the studies that I’ve seen in the past have talked about what people say they might do, but they’re hypothetical ones. What really affects your decision right now to treat that particular animal?  Second question is, well, why use antibiotics instead of an alternative means of infection prevention control? This question is very rarely asked on the veterinary side, and is limited often to vaccine use only.  But to me, the third interesting question is, what would it take to change your decisions for question one and two? Something that I’ve seen very little work done.  And the reason I advocate for health promotion approach is that’s what health promotion is about – it’s about affecting choices; it’s about affecting behaviour. And here we see with our theory of human behaviour, certainly on an individual level and community levels, it affects the behaviour of individuals in the environment in which they make those decisions.  And health promotion has some tools and approaches, like education and communication, looking up policy and organizational change that can help to influence people to make health promoting decisions, or again, in our case, appropriate drug-use decisions.  Health promotion has some additional benefits of having some principles that are supportive of the complexity of the anti-microbial resistance issue. I mean, health promotion addresses health issues in context, which I think is very important. I think on the veterinary side, a lot of the debate among anti-microbial resistance has been somewhat isolated in the sense that it either looks at the organisms or it looks at the animals, or maybe the farm, but not necessarily that farm in a broader context. So health promotion supports a holistic view by being multisectoral and by doing so it draws on the knowledge from a variety of sources. And we’ve heard Dr. Butler-Jones saying the need for an integrative, collaborative approach to AMR. I think what’s very important about health promotion is it tries to create healthy living conditions, or conditions, in my mind, that would be conducive to keeping animals healthy.  We did a review a number of years back for the Public Health Agency of Canada, where they were asking us, what’s the best thing we could do to reduce our vulnerability to emerging zoonotic infections? And the conclusion was, well, keep the animals healthy.  Now, they actually paid us to do that contract and to come up with that answer, but it’s an answer that, if you look in the literature, is rarely discussed. The best evidence for controlling risks to public health from animal health is fundamental investment in animal health. Healthy living conditions, good husbandry, good animal welfare. But the bulk of, again, research, investment, and publications, are dealing with things like how can we do novel micro-biological detection methods to find the newest disease.  The next thing about health promotion that is valuable is that, as I say, it is focussed on individual choices, and focus on creating awareness and understanding. There’s some contextual issues I think we need to keep in our mind if we start to take the health promotional view, and I think that is that farmers, or most animal owners, would rather not use anti-microbials. And I talk about farmers in this case because a lot of the debate is about getting antibiotics out of the food chain.  Now, a farmer, as soon as they have to use an antibiotic, I show this picture here because you inject an animal, you bruise the carcass, you bruise the muscle, and that costs you when it goes to the slaughterhouse. Things get trimmed, you lose money. That means if they’re given things, antibiotics, they either have sick animals or they have sub-optimal production. It’s an added cost to those farmers. So they, they really don’t want to have to use antibiotics.  But if we look at the literature on infection control and agriculture, the vast majority is focussed on new drugs and vaccine, with very little research and development on the healthy living side. The problem with that is, we can create new technologies or new drugs or new vaccines, but we don’t necessarily have proven economically viable alternatives for those farmers.  So I’ll give you some examples of this, and why we need to look at this in a multisectoral context. Feedlot cattle are often challenged with two significant problems that result in anti-microbial use. One is respiratory infections, fibrinous pneumonias that they’ll get soon after the feedlot. The second are liver abscesses.  In the first case, there is significant research that would show that if you take the calf, right now the standard practice is the calf comes off the pasture with the mom, you take it away from the mom so it’s weaned right away. It’s castrated, it’s ear-tagged, it’s vaccinated, it’s put in a truck and it gets to the Feedlot. Pretty stressful for that calf. If you do something called ‘backgrounding’ , which is wean the calf on the farm, do the management things like the castrations and the ear-tag and the vaccine, and then give that calf time to recover, the infection rates plummet. The problem becomes the economics of the industry in the food production system and the way the production cycle’s set out, means that backgrounding those calves cause delays in getting calves to the feedlot, and it adds cost to calves.  And while most farmers would value that cost getting off-set on their production cycles and therefore, getting out of line with the slaughter houses and the purchasers causes them a business modal that’s very hard to manage. And so therefore, they’ll buy the calves that are available early so they can start getting them fed, and those aren’t the backgrounded calves. So we have an economic demand.  Similarly, these liver abscesses that I’ve talked about, with the animals tend to get those because they come from grass, they come from their mom’s milk, they’re put in the feedlot to a higher grain diet to begin to get them to grow at a rate that’s necessary to grow at. And at a certain body fat composition, which the consumer demands. If we transition those animals on to their feed more slowly, start them on a hay diet, work them into the slaughter diet, infection rates decrease because the hepatic ulcers, or hepatic abscesses are secondary to gastric ulcers that they get from these various, they call them hot feeds.  The problem of course is that the processing industry demands a standardized animal that’s grown at a certain size at a certain time, and in fact, a feedlot operator will even get penalized if its animal is too big. So we have again these industrial drivers that are affecting the choices for these farmers to pick some of these appropriate alternatives.  So it’s very important that we understand the socio-ecological context when we start suggesting people should do something for anti-microbial use in animals and think about that as a blanket statement. Certainly, an intensive regulated livestock production is not gonna have the same context as an overstocked communal system might be. And this is even more challenging when we start talking about this on a global level. I work with small-holder agriculturalists in Sri Lanka and I go to those farms. They aren’t even sure what the antibiotics because there’s no, they get their product from Thailand and there’s nobody to interpret, the feed salesman says, try this. There are no diagnostics to support them. There are no routine cultures done.  That’s very different than the setting in a modern food production system in Canada. But the pressures in poultry are gonna be very different than the pressures in cattle, which are gonna different than the pressures in your dog and cat. Certainly, when people take their dogs and cats to the veterinarian, they don’t want the old-fashioned antibiotics. They want, this is a family member, and they want the best and the brightest and they want it now. So we have to realize that blanket statements about antibiotic use in the animal sector has to take this socio-ecological context into account.  The challenge we have is, again, these varying perspectives. When I go to meetings with my Public Health colleagues, I very rarely hear them talking about socio-ecological issues in agricultural management as a target for intervention for the animal side. Similarly, when I go talk to my colleagues in veterinary medicine, the message hasn’t really sunk in that my clinical colleagues in infectious disease in human hospitals, views these as a crisis, as clinical emergencies. So we have different perspectives, and when we have different perspectives you tend to not have the same vision as to which are the next steps to go forward are. And one of the principles of health promotion is that one of the common multisectoral understanding in vision is really critical to promote the appropriate use, or the appropriate actions for any health promoting area.  As I mentioned earlier, when we look at the animal sector, even if we look at something like the feedlot industry, it’s unrealistic to think that any single thing is gonna make a significant change in infection control and drug use outcomes.  And I think that’s been shown in the healthcare setting, where, I quote this one paper looking at infection control and hand-washing in hospitals and concluding certainly that no single intervention would increase or sustain health worker compliance with infection control practices. And they looked at the various social factors that affected their behaviour. So certainly, we should assume the same thing happens at the animal health worker or animal owner.  The problem becomes, is nobody has systematically asked what influences decisions to use anti-microbials. We have a lot of assumptions out there about antibiotic use in animals. A lot of assumptions that it’s all about money, a lot of assumptions that it’s all about access to drugs, that a lot of that is just habit. But there hasn’t been a systematic review of, why do you decide to use this and not that? And, what are the driving forces and factors that influence your decision? This is that, to me, a significant gap in our consideration of what to do about anti-microbials in animals.  This next slide, as I’m seeing it on my screen, is probably illegible on yours cause it’s come out rather small. But this is a slide I’ll walk you through that I actually had a student work on for me this summer. And I said, I want you to find the literature that tells me what we need to do to ask people to change their behaviour.  And certainly, on the far left, those rectangles say, they need to understand the change in the pros and cons. Then they have to ask, what’s stopping me from changing? And there’s two major factors for that. One is that the person has to know the positives and negatives of the change and really consider if they can adapt to that proposed change. To do that, they have to know that they are enabled to do so. So by the time we go to the far right, we see that significant information has to be developed and applied to prime the group, and in this case, animal owners and animal users, about anti-microbial use and resistance.  But that’s not just throwing them out information and best-use practices. There are things like social factors - peer-to-peer networking, mentoring, looking at the possible role of role-models, affecting the social norms, these are all things that affecting the social milieu has to change in order to affect the behaviour. Similarly, the social marketing isn’t just about throwing out a pamphlet or posters. It’s really about developing trusted relationships, getting information from reliable sources.  When it comes to enabling people to do things, it has to be the internal ability, so in this case the farmer, the animal owner, has to think it’s within their span of control to change practices. And when we look at things like the feedlot example, a single farmer changing could be a disadvantage because the system hasn’t changed.  Similarly, there has to be the external enablers. There has to be the people who are trained to help them to deliver the information, to help them to access the resources. We don’t have this sort of a program when we think about anti-microbial resistance in animals. To a large degree, what we’ve been investing in is growing culture and recounting as opposed to understanding, influencing, and enabling.  So why is so little been invested in health promotion in animals? I must tell you, when I teach this course to students and I talk about constants of health promotion and even population health, this is new to the students because most of them come out of the science or biology background. So the biomedical modal still prevails largely in the veterinary medical education and in the funding.  Secondly, agriculture research is often tied to profitability. We’ve had a model of maximum profitability; we now have funding agencies that asked you how this will improve production, what will be the economic return to Canada. And there’s a problem with that, which is the very last board is, how do we count for the public benefits, the public services that come up from a private sector? So what ends up happening is we have a disconnect in funding and programs between the Public Health groups and the Animal Health groups. And this leads to, really a lack of consensus of what can be done to change behaviours.  So there’s some significant challenges to move us forward to this more enabling modal. Some of the challenges are, well, they are complex systems. Anti-microbial resistance and drug use are part of these tough, messy, complex systems that are hard to attribute impacts and hard to calculate the costs and benefits.  Approaches like the eco-health approach that we use for infectious disease issues in international development would be perfect for an anti-microbial resistance approach. But it is not something that has gained much traction in the Canadian setting.  One of the other problems are the, there are many groups that are interested in anti-microbial resistance, but they tend to organize around sectors. And when we start having people organizing around sectors, it starts to emphasize differences rather than commonalities, and I’ve seen this over and over again. In meetings that I’m at, as soon as we invite people based on their sector, there’s the automatic need for people to try to defend their sector, even if they don’t, actually being attacked.  So the second problem with that is we don’t have a single shared voice advocating for behavioural changes. And really, I guess, I’m happy to see Doctor Butler-Jones talking about the roles of the Public Health Agency in coordination, but I still don’t see an all-out government approach to anti-microbial resistance. Certainly, he and Doctor Brian Evans, who’s the Chief Veterinary Officer probably meet more than I’ve seen Public Health people at a high level and Animal Health people meet in the past. But still, our policies and our approaches tend to be fragmented and sometimes competitive, rather than an integrated, holistic view.  I think the realities we have to face is that the bio-medical approach isn’t working. It certainly, I think on the historical side, it’s worked beautifully. We have some fantastic drugs that’ll stop some significant diseases, but by continuing - I don’t think we can continue to ‘event’ ourselves from AMR issues. Bacteria will continue to evolve, will continue to have selection pressures, and the capacity to build new drugs are, it’s just not gonna keep up. Similarly, as we’ve seen with the recent decades of the emerging infectious diseases due to globalized movement and trade, the possibility of vaccinating for every bacterial disease quickly is an unlikely phenomenon. So I think we need to advocate for somewhat of a different approach.  Secondly, the ‘ban the drug’ approach faces significant political opposition. This tends to be the response from a number of my Public Health colleagues, especially for growth promotion, they say, or animal use, but there are many different factors arguing against that – industrial, political, economic. There, it’s not gonna be a quick fix by any means.  But what bothers me more with the idea of, ‘let’s just go and tell them what to do’, is that’s gonna decrease the cooperation for the next problem. Maybe it’s gonna be the emerging influenza. By bringing in the heavy hand of regulation rather than a cooperatively developed strategy, which might include banning the use, it doesn’t create those trusted partnerships that are so important for collaborative work. And I think I worry about that impeding, our abilities to interact. And I’ve seen that on the heels of influenza. Movement on other public health issues have been affected by the impact that it had and the way people approached some of these other zoonotic diseases.  I think our big goal is this, right? We want the Animal Health people to feel empowered, to make appropriate use decisions. And that’s really the health promotion modal. How do we empower people to make good decisions?  On the very bottom of this diagram you see that diamond, the moral fulcrum of social responsibility, and I don’t think anybody should walk away believing that there’s anybody on the animal health side who wants to encourage anti-microbial resistance. I don’t think making the moral argument, ‘this is the right thing to do’, is really going to work. The question becomes, how do we give these people the control and the power to control the things they need to do, the appropriate knowledge, the skills, the role of their community in the broadest sense, and again, the perceptions that they decide to move in a way that’s consistent with the goals of all of those who share the same bacterial ecology.  Doctor Butler-Jones talked about the importance of leadership, and these sorts of issues. And I think that the question I always have is, who really speaks for the integrated approach that unifies both the needs and the opportunities to reduce drug use and anti-microbial resistance. That means we need leaders. And I don’t necessarily mean a leader like at the Deputy Minister level, but at the health unit level, at the farm level, and all sorts of levels. How do we have these leaders who are comfortable in working across sectors and in these complex social, political and ecological settings?  We don’t have a lot of those sorts of folks cause we generally trained and hired people along their disciplinary boundaries. But encouraging that sort of leadership at different levels would be critical to move us forward. Similarly, I think we have to stop, start shifting from attribution and blame to thinking about incentives. I mean, how can we facilitate people to use less antibiotics? Is it making access to healthcare ease more affordable? Should we subsidize veterinary visits to farms to receive a public good? Why should the farmer pay for an E. coli vaccine when it does nothing for his animals or his profitability? Should we give tax breaks for veterinary services? Is there some way to give community recognition? I think we have to start thinking about carrots instead of just sticks to help change behaviours.  Most importantly, we have to improve the evidence. We haven’t taken the determinates of health concept to anti-microbial issues in animal health. We haven’t started to think comprehensively about alternatives to infection control apart from vaccination and different drug use. And that’s a broad, sweeping generalization. Certainly, some people are working on this, but it’s not the bulk of our work. And most importantly we have to think about, what are the measurable outcomes in these programs? We can’t just look at a program and count resistance or susceptible strains; we have to look at it within the context of where the animal lives to see if we can develop primary prevention.  Then we also have to really emphasize on building trusting relationships across sectors. I mean, this is foundational to public and population health, but when we did a survey in British Columbia at a health unit level and asked people, Chief – when we asked the medical officers and Chief Environmental Health Officers, how do you interact with the animal health sector? Pretty much all of them said, well, rabies. I said, what else do you do? They were pretty blank slates, largely. The idea of having an ongoing trusted relationship with your animal health workers in your health unit is not common practice, certainly at least in British Columbia.  I think that we have to make sure that people realize this is a shared issue, and we need an alternative strategy. So I think, you know, certainly we need research from everywhere, from pathogen aimed – looking at drugs and vaccines; management – reducing exposure and stressors; looking at the system, at the socio-economic drivers. But also, I think, focussing on decisions and why do people make the decisions, the choices?  I think that this is a bit of a Polly-Anna view of what we should do, given the investment, the movement of Anti-microbial Resistance in Canada, and so I don’t really believe this whole sort of approach will be funded in total.  But I’m very optimistic that a new multisectoral collaboration is gonna move us to more and more effective understanding of appropriate use, than is the current trajectory that we have on trying to integrate animal issues into the Public Health debate about anti-microbial resistance.  Thanks for your attention. |
| Renée | Thank you very much, Doctor Stephen. That was very interesting and we don’t have any questions yet. If anyone has questions, please feel free to post them on the bottom left corner of your screen. And I would like to let you all know that at this time we will be, we have recorded these presentations and they will be posted on AntibioticAwareness. ca, so you’ll be able to access them. They will be translated into both official languages, so you’ll have access to them in French and in English.  I would also like to invite you to attend our webinar tomorrow, which is a French presentation. Daniel Thirion will be speaking. He’s with the McGill University Health Centre, and also the University of Montreal Faculty of Pharmacy. And also Abou Mounchili is the Senior Epidemiologist of the Canadian Nosocomial Infection Surveillance Program with the Public Health Agency of Canada. And he’ll also be giving a presentation on surveillance tomorrow. Those will be in French, and we invite you to join us at 10 a.m. Central to participate in those. And we also would like to invite you to give your feedback for this presentation and the one earlier. There’s a survey available that you can just click on the link on your screen. So if you would like to give us your feedback, we’d really appreciate it, and it shouldn’t take more than just a few minutes of your time.  So if there are any questions ... I don’t think there are.  Thank you again, Doctor Stephen, and thank you again, Doctor Butler-Jones. I appreciate the presentations you gave, and I think they’ve been very informative. So we’ll leave it that, and thank you very much for all joining us, and see you again here tomorrow. Thanks. |
| David | Thanks all. |
| Craig | Bye. |
|  | END OF RECORDING |