THE KNOWLEDGE SESSIONS: ANTIMICROBIAL RESISTANCE

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Podcast transcript

Lara Carim (LC): Welcome to another podcast from RCVS Knowledge, where our mission is to advance the quality of veterinary care for the benefit of animals, the public and society.

I'm Lara Carim and our subject today is antimicrobial resistance or AMR. Antimicrobial resistance was named one of the ten biggest threats to global health by the World Health Organisation in January 2019. So what is the state of play with prescribing in the UK? What measures are in place and what is working? What research is needed to gain robust evidence about the best way to be tackling AMR? Should we regulate? What can we learn from other countries' approaches? And who is responsible for bringing about change?

To answer all the questions and hopefully some more, I'm delighted to welcome a panel of experts chaired by the UK Chief Veterinary Officer Christine Middlemiss.

Before her appointment in 2018, she was the Chief Veterinary Officer for New South Wales, Australia for nearly two years, where she led major improvements to biosecurity across many farming sectors. This work included implementation of new outcome-focused risk-based biosecurity legislation, online animal certification processes, and improving evidence and risk-based disease control approaches. Christine is an experienced veterinarian, having worked in private practice with a specific interest in research, meat processing and livestock genetics for a number of years in Scotland and the North of England.

Thank you Christine and all our guests for being here today.

Christine Middlemiss (CM): Thank you Lara. Well we all recognise AMR as being a wicked problem, as our Chief Medical Officer has described it. She sees the impact of it globally as being as huge as climate change, in that it will have a global impact and it will impact each and every one of us. So it's great to be able to discuss it today, and with me we have a number of experts who I will ask to introduce themselves.

Ian Battersby (IB): My name is Ian Battersby. I'm an RCVS and European specialist in Internal Medicine. I head the internal medicine department at Davies Veterinary Specialists, and in 2011–2012 I conceptualised the PROTECT antibiotics scheme and led the group of vets who developed that BSAVA/SAMSoc [British Small Animal Veterinary Association/Small Animal Medicine Society] initiative.

David Singleton (DS): Hi, I'm David Singleton. I'm a post-doctoral epidemiologist working with the Small Animal Veterinary Surveillance Network (in short it's

SAVSNET), at the University of Liverpool. I did my PhD looking at antimicrobial prescribing and resistance surveillance in companion animals, and I'm lucky enough to continue that work with SAVSNET for the foreseeable future.

Kristen Reyher (KR)*:* I'm Kristin Reyher. I'm a Reader in veterinary epidemiology in population health and I lead an interdisciplinary research team looking at antimicrobial resistance, stewardship and use, at the Bristol Veterinary School.

Steve Howard (SH): I'm Steve Howard, presumably representing the first opinion practice around the table. Head of Clinical Services at PDSA, responsible for clinical standards and ensuring compliance with expectations and regulations that surround the profession. Quite a number of our activities have been on antimicrobial resistance and I've also been working closely with RUMA [Responsible Use of Medicines in Agriculture Alliance], who have done a lot of work in the large animal field around whether we could, or should, establish a companion animal division of the same group.

CM: Great, thank you, so we have a broad range of experience on AMR around the table with us today. Let's kick off with some of the questions we've been asked to think about.

Firstly, what is the state of play regarding antimicrobial prescribing in the UK, from your perspective, and what are the drivers?

Now we've heard obviously there's a lot of expertise around the table, which means a lot of thinking's been going on in this space already, and so I'm interested to hear something about that and where you think we are at the moment.

IB: Who wants to kick off? [laughter]

SH: If we're talking companion animals, then I think part of the silence around the room might reflect that there is no consistent view of what the state of play of prescribing is.

I know SAVSNET has done some very good work on the frequency of prescribing occasions; Vet Compass did some a few years ago but what is probably missing is that consistent view of what trends there are in prescribing behaviours around the country.

KR: I think we might have a bit more knowledge about what's going on in the livestock sectors, because we've seen big changes over the past few years in the livestock sectors and obviously antimicrobials by veterinarians, so that's coming back to the prescribing.

Some of that has been led by industries themselves, British Poultry Council want to really reduce this, the pig industry, the pork industry, the cattle industries, to say 'we want to take a good hard look at what we are doing with antimicrobials and be great stewards of these medicines and really be able to reduce that'. So we have that on a national level, we can see that. On a species level, we are gaining the data to be able to have more information about that and obviously the vets have been very involved in that.

SH: Of course, you have the measures in place.

KR: Yeah, and the targets in place as well.

SH: Right, top line and targets as well. That's a big difference to us in the companion animal world.

IB: If we look at where we were ten years ago, it's very different. I mean, when we started drafting the PROTECT guidelines, we talked about it and lots of vets, it just wasn't on their radar. And now you talk to them and it's very much on their radar. One of the things that's been really encouraging is that certainly new graduate vets, you can see it's part of undergraduate training now so they're a lot more on this, which is absolutely fantastic.

But the challenge is now, everybody is aware of it but we've got to change habits, you know, everybody talks a good game but when you're faced with that individual situation and it's your responsibility and you're used to using antibiotics 'just in case' you've got to use them when they're indicated.

This is one of my areas, one of my soapboxes, but I still find myself in an ICU with a case going well I know I should just use this, in the past I've used this and this. So it's a big ask to change a habit, we're getting there but we've got to work out ways to kind of back up vets on the front line and support them in that decision making with owners and colleagues as well.

In my experience it's a culture change rather than a process, so if you just tell people to prescribe less, it doesn't mean a great deal and it doesn't drive different behaviours so you have to change that approach to antibiotics.

KR: It's being brave in that I think, and being able to showcase to people that have done that or being able to show you don't need that antibiotic in that case, and just having the bravery to step out and do something.

CM: Can we reflect then, talk a bit about what's happened in the farm animals and talk about how we might get to that, not the same situation, but how we might help people with what the drivers are in small animals; I would like to explore that more.

So in the farm animal sector following Lord O'Neill's report on the publication of the UK five year antimicrobial strategy, an overall target for sales of antimicrobials in animals was put in place, government didn't say to industry that this is what you've got to do, and this is the targets you've got to reach, which was quite unusual compared to other countries.

Industry completely bought into the need to do something about it and have really owned this working across the sector from farmers, vets, scientists and so on, and I think for me the key has been that people understand how their farms run and how their businesses run, and vets understand their decision-making process and so everybody's bought into the overall 'we want to get there' but have their own tools and levers on how to do it, and that has proven really effective.

In the small animal world of course it's even more complicated because its individual pets, it's individual animals often that you're thinking about. Any thoughts then on

how we might work on getting consistency of approach but still doing that individual care?

DS: I think what we know about the drivers of prescribing in companion animals, it's quite complex, it's quite multi-factorial, and it ranges from the individual animal, to the presentation, to the vet, to the owner, to maybe a practice policy or even wider – which in some ways might be quite disheartening, but in others it provides opportunities to really work on multiple levels, and I think rather than (it's perhaps an element of a personal opinion) having a target, I'm not convinced that would work in companion animals.

What we might be able to work towards is a more targeted use towards actually providing the evidence and the confidence to particularly first opinion practitioners to behave or to act in the best interest of animals, and know they're acting in their best interests.

SH: In the small animal world, because it's quite often on a one-on-one basis that those decisions are made, it's chipping away at the totals that we use as well. For example, in the UK's five-year action plan of a pig farm where they quartered the use of their antibiotic use by approaching an entire herd of sows by a really significant amount in one go, whereas we can't do that in the companion animal world, we have to have it in mind every time we have a pet, and their owner, in front of us.

CM: The owner bit really interests me, because I do a lot of speaking with medical colleagues, to them about what we are doing in the animal world, but also with them in terms of a one health approach, and it strikes me that you're talking about that owner, who may be one of us, who is also a patient – the drivers are different to degree – but there is something about joining up the narrative and the language you use, so that expectation whether you're going to your doctor or you're taking your dog to the vets…

IB: There's an element of consistency approaching it across the practice, because you'll get one vet who might adopt a good stewardship and then if an owner sees another vet that doesn't adopt the same approach, that completely undoes all that messaging.

I mean, in an ideal world, for me, antibiotics stewardship is closely linked to infection control, so every practice should have somebody leading infection control, so that individual should also be an antibiotic guardian, promoting the advantages of using them actually more sparingly. That's what I'd love; whether we can achieve that…

I think there are lots of ways of engaging the profession. If you look at all the different areas of companion animals, you've got lots of different organisations producing guidelines, which is fantastic. If anything I am a little bit worried there's too many messages going out, so it would be fantastic to engage with large groups and get them all under one roof, dare I say. I know that there are large groups of practices that are linking together; I'm not going to enter the debate of the pros and cons of that; but one of the advantages is that consistency across that large group, you know, so inviting them all to roundtables, getting a consistency of message in all of those areas is a very powerful thing.

KR: How about using the data in a way of benchmarking, we all like a little bit of competition…

IB: Oh absolutely.

KR: …and clearly we're looking at, as you said, infection control, and we want good disease control and good curing of infections, etc. but being able to say that's been done in the livestock sector as well. So let's see how your farm is doing against your farm – how can you can make those changes, and then how can you go about that?

At our practice, we changed prescribing. At our vet school we did things: we labelled our shelves green, yellow and red, and the protected antimicrobials went on the top shelf where you needed to go find a stepladder to get up there to reach them. Now, how hard is it to find a stepladder?! And while you're doing that and hunting around and cursing to yourself you're saying 'do I really need this? Or could I go with something that is at eye level or something that's easy to reach?'

The behaviour changes; little things like that can make a difference: having an antibiotic guardian, having a champion in your practice that is kind of looking over your shoulder, that you think in your head 'oh if I use this prophylactically David would say tut tut tut', might just put you off just to say 'well I'll just try with this one'

IB: I think you touch on a really good point, in that you know there is going to be a lot of people in companion animal work that are not aware of the fantastic work…I was reading a little bit about all of the work in the chicken industry, they've made a massive impact.

I know that's slightly different because you've got a smaller pool of vets, but that's something that, if the companion animal side was aware of what can be achieved, like you say it's the competitive edge, we should be able to achieve that.

DS: It's that old nugget of sharing best practice or good experience, isn't it, and that is one of the reasons we started talking to the RUMA guys in terms of…

CM: Let me explain RUMA for people who don't know. RUMA is the Responsible Use of Medicines in Animals [sic.] *Alliance* [Responsible use of Medicines in Agriculture Alliance] – sometimes people just stop at 'Animals' [sic.] but that's what it is. It's chaired by an experienced industry person, and as I said, it's made up of a group of industry representatives with some vet input. VMD [Veterinary Medicines Directorate] is the government input and they have a scientific advice committee and things, and it has…

I'll talk in a minute about some of the changes they have successfully achieved in the area, but it has proved really successful as a collaborative group to make the changes happen.

SH: It has, and underpinning what you said there, you can make it awkward to get antibiotics, you can label them, but underpinning all that is the evidence and the protocols. We've introduced a few at PDSA that we have then shown have worked and achieved what we wanted to, but it stays where it is, all that good experience.

So part of the reason for us starting to talk with RUMA was 'how can we share this' and bring in some great BSAVA work and the BVA [British Veterinary Association]

work that has been done, and lots of other groups, and pull it all into one place; not trying to necessarily rebrand it as RUMA but just have one place for antimicrobial guidelines.

CM: Yes, picking up on Ian's point that there is so much information out there.

SH: Yes, and by disparate groups, and it comes together a little bit at the end of the year for European Antibiotics Awareness Day and the 'One Health' approach because the medics, Public Health England, get involved in that too – but that is a relatively short-lived phenomenon, shall we say. Probably what could help that culture change is constant hints and reminders coming from that kind of group.

CM: Yeah, we know that you have to think about changing your behaviour a certain number of times before it becomes habit.

SH: And be reminded to do so!

KR: And I think one thing we struggle with in the veterinary community that the medics have on us, is that they have more evidence about urinary tract infections, how long is the shortest course you can go for.

They really have good studies, well-powered studies that have those NICE guidelines, and we don't have that in the veterinary profession, but we should be able to develop those sort of things for common ailments that we see in common species of animals, and then you can have the confidence to say; 'right, the numbers say this dog I'm looking at shouldn't need this antibiotic' – watchful waiting or delayed prescription, as the human medics are doing, and then you are getting the same message from your doctor as you're getting from your vet.

DS: I think the delayed prescription point is a really interesting area to pick up on, as well as the no prescription. So the Small Animal Society recently released a no prescription pad that will essentially say 'your dog is showing signs of vomiting and diarrhoea at the moment. I don't think antimicrobial is necessary but come back if you are concerned or XYZ occurs'. I think it sort of fulfils that need to provide something to the client.

CM: And the client feels validated that they had a genuine concern.

SH: And also, part of it shows things to monitor for, if things didn't go well, but part of it as well is that it allows the practitioner to say, 'well look, I'm saying this and I'm backed up by this organisation who has produced this guideline', it's just giving them a little bit more confidence in that scenario, you know, that there's an organisation dedicated to this and they're being backed up, you know, Mr Smith has been giving antibiotics for this problem for the last 20 years and actually you don't need to.

DS: I guess it might be nice in the future that there's a reputable organisation put that forward perhaps there's a list of reputable list of organisations that fall underneath it; that umbrella underneath it.

SH: Absolutely.

IB: I mean, it would be lovely to have everyone on that list backing it up, it would be fantastic. Coming back to the duration of courses is a massive area which we should

look into. As you quite rightly pointed out, in human medicine they're doing a lot of work looking into shorter courses in community-acquired pneumonia, halving the duration.

If you look at a lot of the veterinary courses that are in the textbooks, I originally wanted to put all the durations in the guidelines, but there's no evidence to back them up. The only thing that you can notice is that they are either in multiples of 5 or multiples of 7, easy to remember and complete. So there's fantastic opportunities.

I mean I've just been doing a project with a first opinion practitioner on cat bite abscesses, a very simple observational study, and we're just finishing it off now, and it's really cool. That's a condition that in a lot of practices now is treated with ten days of antibiotics and putting drains in and stuff, going back old school to manage it with lavage and stuff, and it's showing some really nice results. So this very common almost low-hanging fruit, first opinion practice.

SH: I think you're absolutely right, and that's where we focused as well, so trying to find those durations we found exactly the same issues. So one of our protocols focuses on the conditions that present that shouldn't be given antibiotics at first presentation, and that then takes away that group I suppose, and then we can start to address, if you do choose to give antibiotics, how long should one give it for, might be the next area of work for us, but that was some of that low-hanging fruit in that: cat bite abscesses, kennel cough, urinary tract…

IB: Acute diarrhoea

SH: …diarrhoea, we've just said, you don't need to give them antibiotics, unless they are showing certain signs, in which case you can consider it. And that's landed pretty well. When we've done tests on kennel cough being diagnosed, for example, and whether that got antibiotics at the time, it was 85% compliance I think across our 45 hospitals and 350/400 vets. If you back it with evidence and get it out there in the right way it can be done.

IB: The key like you say, I read a review over the weekend, it was based in Sweden where they were reviewing all the guidelines they did, and one of the important things that came out was that if you're writing a guideline you have to have strict, strict criteria to fulfil that so don't give antibiotics in diarrhoea if this, this and this is happening, because otherwise it's just a… there's always exceptions.

Even when you look at some of the other models in other countries, they've evolved, they've started changing it, making exceptions in certain scenarios, because you can't be too prescriptive because if you go the other way then you don't do your job and patients suffer.

SH: If you say 100%, you're going to be disappointed in the outcome, and what you're potentially doing is putting some clinicians at risk of that approach of 'I never can give antibiotics to this'; there will be some cases where it should be given.

KR: But then you get a consistency of method don't you?

SH: You get a consistency amongst the majority.

KR: If I have a cold, I don't go to my doctor to get antibiotics because I've heard that a number of times, so you get that consistency, which also gives the clients some confidence. And the work I'm aware of say that vets feel pressure, we feel in ourselves this client really wants some antibiotics, they really want me to give some antibiotics…

GPs feel the same but actually when you ask the client – do you want, have you come here for antibiotics, they say 'no, no I trust the vet, whatever the vet thinks is the best thing for me' and if the vet is backed up by evidence and the vet thinks they don't need it, and the GP is the same. So we can have that confidence to say 'we know we don't really need it' and hopefully that then gets to the, it's not the consumer, it's not the clients that want it as much as we might feel like they do.

CM: I think there's something in it about, as clinical vets, validating us, so you want to prevent any welfare impact disease, so that's the way culturally we've started to deal with that, but you're right – if the evidence validates you doing something else, then it's changing the mindset to say 'I've prevented a potential increase in antimicrobial resistance, there are still other options if this animal is not improving'.

DS: I think there's probably a space for bite-size education for clients. I think that conversation in a consult room where a client requests antibiotics and you try to say 'actually I don't think it's necessary' can still be quite difficult… I don't want to use the phrase 'win', but almost to convince the client and having that accessibility to resources actually xyz justifies.

CM: One of the things I…two things I constantly remind our medical colleagues of: 1) veterinary practices are all individual businesses or part of a bigger, but 2) they're businesses, they're not NHS-funded and that's why we all have different IT systems and things like that, why can't you just pull all your data? It doesn't work like that.

DS: From a SAVSNet perspective that's a problem, that's a daily problem.

IB: I think that's why David's work in particular is really useful, because we're all time poor and we're doing some work at the moment where we want to set up some very basic audits into all our practices, just to get them to look at ten consultations. But I know that will be really well done in some practices and in others it's 'I haven't got time for that'. Whereas David's work is going to well hopefully, evolving that and providing that information.

CM: David, do you want to talk about what you are currently working on?

DS: Essentially it's providing, SAVSNet is a selection of 200–300 practices in the UK, roughly split between independent practices and large group, corporately owned (not quite sure if that phrase is good or not but I'm going to use it anyway). We collected their record data from the practice management system and monitor all sorts of disease trends, but my primary interest of course is antimicrobial prescribing.

We also have a component that collects records from laboratories so we're starting to look at clinical resistance trends as well. We think that the idea of joining these two together, at least in prescribing, start to shine a window back at the practitioner, something that happens quite frequently. We talk to practitioners saying 'my prescription is fine, it's okay' and then you can sort of shine the benchmark back at

them and go ‘what do you think now’? We try actually to not prescribe judgement in that respect, we understand that every practitioner has an individual situation but they’re best placed to reflect own clinical practice.

CM: How do practitioners that are not currently using the system either access any information from it or indeed provide information into it?

DS: At the moment, funnily enough, we are talking about practice management systems, some work with two practice management systems, and we would like to work with more. And at the moment the technology, so essentially there is a feed into the practice management system, the PMS, that enables SAVSNet to start collecting data, with the owner’s consent I should say.

At the moment that’s limited in that it has to be a one practice member system at a time, and of course with there being so many PMS’s in the UK, that’s a bit of a slow process. But we are hoping that things like AMR will help start to make PMS providers realise the value of sharing data and bringing it together.

SH: Therein does lie a slight issue I suppose in the current state of affairs, in that practices, depending sometimes on which practice management systems they have, are either feeding into the SAVSNet system, or the VetCompass system. And your idea I suppose, would be that data from both of those would be pooled together to give us that nationwide view of how practices are behaving, and what the prescribing is.

So it’s one of the conversations we’ve been having as we’ve started trying to develop this in terms of what data sharing, I don’t think it’s happened in the past between the two, but to try and encourage that I suppose.

IB: I think that’s one of the things we’ve got to watch for in that everybody’s recognising that this is a big issue but we could very quickly find ourselves repeating work that other people are doing, not just confusing the message but spending a lot of time on stuff that’s been done elsewhere when we could just do it together.

CM: On that, you touched on it already Ian on some other country systems, what are other countries doing and what can we learn from them and think about?

IB: I’m only aware of general trends in Sweden and Holland, they’re the main ones I’m aware of. I’ve got friends who work in Sweden and friends who work in Holland, but in Sweden I know that the Swedish veterinary regulators produced guidelines many years ago, actually they really led at the forefront.

I don’t think there’s any legislation around that, it’s voluntary compliance, and from chatting to my colleagues in Sweden they say one of the frustrating things is that some practices adopt the guidelines rigorously, you know they don’t prescribe flouroquinolones without any cultures, but then there’s other practices that don’t. In that you can see that they are getting some obvious engagement with some people but then there’s the mopping up, and that’s the challenge with voluntary guidelines.

In Holland, the Dutch model, I know there’s a lot more legislation, and a lot of that focuses on farm animals. From a companion animal there’s the flouroquinolone restrictions and they’ve also, if I understand correctly, they’ve banned the use of

carbapenems and glycopeptides even on the cascade which is, I guess everybody has different views on legislation, but I feel very uncomfortable about using those drugs in the patients we see.

We have this debate all the time, there are some large vets' skills that have infection control committees that only allow those drugs to be used once it has been passed, they're a valuable resource that we should really treat very respectfully. So, whether that evolves in the UK or not, I don't know.

Certainly chatting to my Dutch colleagues, they say it was very well received, on the whole, they didn't actually do a lot of campaigning to make everybody aware it was, I think it was MRSA in pigs, contact with pig farmers, that alerted them and everybody adopted. There were fines if you didn't comply with it, but certainly you can see the evidence in that their antibiotic prescribing dropped considerably and also I think the monitoring of resistant profiles has changed quite a lot for the better, so they are a great kind of beacon. It's probably a bit more, I don't want to use the word aggressive, with legislation rather than asking people to engage, they took more of a firmer approach.

CM: Something I get asked about constantly from other countries, is that farm animal space we haven't regulated, and primarily that's been driven by the will of industry to tackle this and microbial prescribing is in a number of insurance schemes. You have to be a member of insurance schemes to market your animals, and there's that implicit driver anyway.

But we know legislation is a tool to help people when the mass majority have taken action but we're let down by the people who aren't, who don't do that. But I am uncomfortable of how it would work in actual practices, and how on earth you would know what was going on and who was doing what by scrutiny of records and things.

KR: I think the Dutch invested quite a lot into their system so that they had systems that could collect all that data and put it together so you wouldn't have pockets of disparate data in different places. But even locally, Ian, as you were saying, you can look at what you're doing, you can look across your practice if there are six to eight vets in your practice or 68 vets in your practice, somebody's job or someone who likes playing with numbers can do that and kind of see 'how am I doing, how is David doing, how is Christine doing' and then say' oh David you've really managed to not treat any diarrhoea cases with antibiotic — how did you do that?'

And yet your recovery rates are just the same, you didn't have any dogs get sicker etc. so tell us your best practice and I think there's something for that. There's also something in the bite-size conversation and talking about the downside of antibiotic use (there can be side effects that can be quite bad).

You're wiping out natural flora by using these medicines, so talking about the problems that we have with that as well, they're not always perfect, wonderful things that we want to use, it's not just resistance that's an issue, although it's an increasing issue, there are other reasons why we might not want to use them, so here's some vitamins or here's rehydration solution.

DS: It's interesting we were chatting before we started and the whole natural animal argument is sometimes a bit of a cause of rolling your eyes within a consultation, but actually when it comes to antibiotics you wonder whether you could use the healthy animal holistic, dare I say it…

KR: It's a viral infection, your animal is immuno-competent, they should be able to get better on their own.

IB: You just reminded me of an abstract that was presented at Vet Dynamics. I think it was about 18 months ago where somebody, I can't remember the institute, they gave some routine antibiotics to dogs that were healthy and monitored them for a couple of weeks and they had GI side effects, GI signs.

Now we normally go it's just a primary disease, that's why they've vomited but they showed that actually, if you think about it, in humans all the C. diff diarrhoea and things we don't really recognise that or talk about that (yet) in dogs and cats, but it's a known quantity in humans so why are we not picking it up?

KR: And what's that doing for transmission between us and our animals, and our families because the other things is that the antibiotics kills their normal flora, so it makes you a bit of a hoover, a vacuum cleaner, for anything bad that's around you, and that's sometimes how you can pick up a resistant infection so that's putting them at risk from a number of different ways.

CM: Do you think there's a role for the Royal College in this and, or more specifically, RCVS Knowledge that we're doing today in all of the debate and progress?

KR: I think RCVS Knowledge has done quite a lot on auditing, really pushing that, and providing tools to be able to do that very well, so you can use those data and to look at your own practice and benchmark your own practice.

I think the evidence-based stuff as well, so the stuff we talked about, the fact that sometimes we don't have much of an evidence base — how do we create that, how do we get practitioners that are very busy, but they are the ones out there touching those animals that have that data — how do we get them to record that a bit better start project like looking at cat bite abscesses, looking at kennel cough, looking at pneumonia in coughing calves, they see that, they have that data. So how can we envelop that and get the evidence via them, and RCVS Knowledge does a lot of that sort of work.

IB: We talked about all the different individual messages going out from all the different industries. The RCVS could be an organisation that tries to bring everybody together and spreads the good work that everybody's done. I think it would be interesting, I don't know if other people would agree, for maybe the RCVS Knowledge to survey practitioners about their views on signing up to voluntary codes, even ask their opinion on the Dutch model where they've banned the use of carbapenems and things like that, see what the appetite for that kind of thing out there is.

But also in the practice standard schemes that the RCVS do, I believe there's more they can do. There's certainly points you can get for evidence of antibiotic stewardship education material in the practice, but there's good evidence showing

that if you have an antibiotic prescribing policy in a practice, appropriate use improves and inappropriate use decreases, so I think that should be part of the hospital standards scheme. I would love it if they said you have to have an antibiotic guardian and show evidence of auditing but that is pie in the sky. Even if we just had evidence of stewardship in a practice, I'm sure that would start making impacts.

SH: I think RCVS Knowledge could add credibility to evidence that is produced. There's been a lot of focus on practice-derived evidence as well and RCVS Knowledge sharing some of that and rubber stamping it almost where it is good would probably add a lot of credibility to that and potentially increasing the uptake.

Along with the practice standards scheme, there's also professional codes of conduct. Veterinary surgeons should prescribe antibiotics responsibly and I suppose that's the difference between the legislation and regulation, and how do those two sit next to each other and how would that be received by the profession if that regulation element were to be beefed up.

I don't have the answer to that, but it's something to think about. The practice standards scheme is still voluntary. So those practices that sit there and go 'well I'm not going to bother with these antimicrobial resistance stuff, I'm not going to introduce any protocols' are probably the ones that aren't on the practice standards scheme anyway, so you're still going to have that nut to crack.

CM: …and probably not contributing to SAVSNet or VetCompass…

SH: …and probably not contributing to any data, so it's how you get 'the in' to those practices or individuals that aren't engaging with it

CM: Or the clients to start creating demand through them asking.

DS: It would be really exciting if you could develop a business case for stewardship, actually this is something a practitioner would look for, because I know we have a practice standards scheme but maybe there's a way of adding to that. It's a bit of a vague force at the moment but…

KR: And how about publicising vets that are doing that really well, practices that are doing that really well, having champions be more visible, because we know when there's a bad news story everyone reads about who got struck off, you know, but actually how much better to read about, wow this practice reduced their usage by this much and still has good animal health and welfare measures, still gained clientele, which is what we found in our practices, wasn't a loss to people being progressive or being proactive and look people want to come to us so that's the business here.

CM: So picking up on that, you gained clientele but you're reducing antibiotic use – how where your clients aware of that, the clients, was it word of mouth? Did you…

KR: Yeah, just talking about it with other clients, this was in the farming community mainly so farmers talk to other farmers. People had heard about it on the news, they had heard about it at the hospital, they were a bit worried and they said 'oh I want to go to a vet that is actively working on this and wants to do things in a different way'.

And so I think that is what we were known for people said ‘oh I’m interested, my vet didn’t really want to engage’, this was quite a few years ago. ‘I want to work with somebody, you know, I had a baby who was in the NICU had a resistant infection or grandparent or whatever and I really don’t want to be part of that problem, I don’t think we need these antibiotics and maybe I can be a bit braver.’ And we can start to collect those sort of clients as well, which brings it all forwards.

IB: I’m presuming that’s focusing on husbandry systems and things like that, so I presume there’s impact on the welfare of animals if we tie that all together.

KR: Yeah, and we showed that by not using any of the fluoroquinolones, third- and fourth-generation cephalosporins, that actually our health and welfare parameters stayed the same or got better, so you can do that via management and then you don’t need them.

I kind of agree with you, I don’t really want to see them banned because there may be resistant infections that you might want to be able to treat, but we typically don’t need them and having done that in our own practice gave us the confidence to say to the farm animal community ‘you don’t need these and your animals will be fine’, and now it’s part of the assurance standards and without an incentive you can’t get them, but without that basis of evidence and that confidence to say look we tried this.

Watching what the Dutch did the same sort of time they did it, they were fine, we were fine, your animals are going to be fine as well. Then that makes a big difference.

SH: I suppose that reassurance that veterinary businesses’ bottom lines are not hit by not giving antibiotics would go quite a long way. For us as a charity it makes sense for us not to give medications out that we are giving out for free…saving the charity money, so being able to reduce antibiotic usage from 45% of animals walking through our doors for treatment, to 28% over the last five years has saved us money and that’s an easy business case to make.

Whereas in your commercial corporate world whatever you want to call it, there have to be other drivers for that change, I suppose that we need to get across, might be good customer experience, the vet taking more time to explain it to me, so it’s been quite a good experience here even if I’m not walking out with antibiotics.

DS: It’s interesting that it’s anecdotal from the business world, that a large practice group found that they the poorer financial performers were the more frequent prescribers, which is perhaps more reflective of maybe more limited work on diagnostic options. And maybe that is tying into exactly what you’re saying about providing the broader experience and justified reply: actually this is not vets trying to make money, it’s actually we want to provide the best care.

CM: It’s the broad experience and it’s the relationship building and the trust, and so therefore when there’s a next issue you come back in and you talk to that vet again.

KR: But we could use more vaccination, we could use more diagnostic tests to make sure we know what’s going on rather than just guessing and giving it antibiotics because they might be cheap. There are other things that we can do, and definitely from the farm animal perspective there is more management, biosecurity and lots of

other things that we can change. But also true in companion animals and diagnostic tests, to make sure we know what we it is we're treating, we know what the disease process is, we can give a rational estimate of how long they're going to be sick, are they going to get to get worse before they get better, because we have some diagnosis not just kind of guesses, give a jab.

SH: See what happens.

KR: Yeah exactly, so there are other ways I think practices can grow and do different things on the preventative side that are also good for vets.

CM: And, did you look at any of that in the PDSA then? Did you increase number of tests done, repeat visits, both positive and negative things?

SH: Well over that period we've developed our antibiotic stewardship area for all of our guys to go and look at, and we've introduced four protocols that have got antibiotics at the heart of them as well, so I think it was a case of gathering that evidence, providing the reassurance, using protocol exclusion criteria – so if this is showing then you are okay to give it.

We're not expecting a hundred percent here and it is chipping away over the years at those habits. But I think the appetite for it has grown as result of that. It is a culture change over time rather than a quick fix.

CM: But you still achieved a phenomenal amount.

All: Yeah absolutely. We're impressed!

SH Yes, we were pleased with the results.

CM: And one thing as we are near the end, the OIE – the World Organisation for Animal Health – have been proactive really in livestock areas and animals that we trade, but there are also a number of other international organisations that look at global health problems and so on, do you think there's more of a role for them?

Should we, could we link in more to them perhaps in this? So we've been talking about how the Dutch have done it, even just sharing best practice and things like that, or is it more 'let's just focus on the UK and our own practices first and what data we have'?

IB: It's a global problem. Travellers as an example bring back GI upsets with multi-resistant bugs, you know.

CM: And if you look from my perspective, the number of pets that actually travel out globally, massive.

KR: Eat some rubbish, eat some leftover food…

IB: I suppose we see a number of pets that have been rescued from Romania and Mexico. In fact I was only chatting to a vet from Romania yesterday about trying to minimise the use in animals (this is focusing on companion rather than farm animals). I know that the OIE and the WHO have kind of got a…

CM: Yeah there's a tripartite between OIE, WHO and FAO [Food and Agriculture Organization of the United Nations].

IB: A lot of abbreviations, I'm struggling with all of them! If they can come up with consistent messages that then seep down, then that's going to be better for the whole world, you know, what Sweden's doing, what Holland's doing is fantastic, but if you look in other parts of the world…

BSAVA have sent loads of the PROTECT guidelines to charities in India who are educating vets – which is fantastic, but that's an area where you can get any host of antibiotics just on the corner in normal shops, so it's a global problem, their role's really important.

SH: I think each of those organisations will have elements of messaging evidence or collateral you can use with patients, that can be used if you can show 'we have a common goal with these global organisations, but it is also applicable within our own little country', then that's quite a powerful message. But we use the OIE stuff in the European Antibiotic Awareness Day because they did some quite good little animations.

CM: Yes they're excellent, and they've done a lot of good work in social behaviour side and drivers, and things that can be translated.

KR: And then again, the UK is doing a great job being able to showcase this on a world stage. It's really nice.

SH: Yeah, make it go both ways.

KR: Exactly yeah, and seeing how other people have done it in different countries where the challenges are slightly different. But sometimes the ideas you see, something that someone in India has done, and you think 'oh, that's a great idea and I can do that here', you know, even though we are quite different cultures I could institute that in my practice – so being able to share that would be amazing.

DS: I think it's the sharing of ideas, right from having those red antibiotics on the top shelf all the way to these widescale randomised control trials anywhere in-between, to actually say, 'This is what I'm doing, what do you think and can you improve on it?'

SH: One thing that cuts across a little bit is the World Health Organization have got their AWaRe categorisation of antibiotics, and if you look at their access list then that's pretty much the list that are on a lot of veterinary practices' shelves, but availability of some of those access medications has been an issue in the last couple of years, and you wonder what behaviours that's driving as well.

The Trimethoprim sulfonamide has gone off the market all together, which was a mainstay first-line antibiotic. There's been issues with Oxytetracycline availability as well in the last couple of years, and you do just wonder whether some of the industry-driven availability of some of those is driving some vets to use antibiotics further down the list, shall we say.

IB: Yes I can remember, and this was a couple of years ago, we wanted a decent amount of Amoxicillin, and it was more expensive to buy a pot of Amoxicillin than of Amoxyclav –bonkers!

DS: I think the Amoxyclav message talks to medics – when you say about the frequent use of Amoxyclav we kind of have the perception of it being a fairly humdrum normal antibiotic, but actually, it's not.

All: [murmurs of agreement]

CM: So we've talked about working with human organisations and a 'One Health' approach, kind of globally and nationally, but is anyone aware of more examples more regionally? I understand there was one in the South West you were involved in, Kristen?

KR: Yeah, Cornwall, Cornwall Antibiotic Resistance Group. So they brought together medics, pharmacists, veterinarians as well and tried to get data off veterinary practices to benchmark

IB: Really? Wow, that's very cool.

KR: And again I think you run into this issue where they are all independent businesses, so the NHS, their data is open and they can share that and they can know that, whereas these businesses felt a little like 'not so sure I want my neighbour knowing what I'm doing here'.

But I remember I sat on a group in Gloucester and a group in Bristol that are those 'One Health', and it's quite, I would say the groups I sat on are quite medical heavy because there are so many more people – there is an antibiotic pharmacist at the hospital that is their job to just say 'yes doctor, you can have that antibiotic' which we don't really have in the veterinary side, but maybe we should.

But there's always quite a lot of interest, and when you think about the potential transmission routes and what's going on with animals, you know people say 'oh so I could be giving this to my pet, who could then give it to my child etc.' 'Yeah potentially.' So I think it is quite interesting, and when we can showcase what we've done they often say 'wow that's incredible' because the Chief Medical Officer had to send letters to everybody, in order to try and change behaviour, which hasn't really happened in the vet industry, but then we can showcase what's been done and I think it gives people confidence.

I have a friend who's a pharmacist and she sits on that group as well, and she said to me the other day 'oh I was talking to a whole bunch of medics and they were all talking about it, saying that all the antibiotics in livestock, that's the real issue'. She said, 'I can stand up and say "Actually people, would you like to see the data? My friend Kristen has told me all about this and they're doing an amazing job"' so I think it helps that conversation about 'One Health' to know that we are also carrying the baton and we want to do a good job.

IB: That's really cool, very cool.

KR: So that's quite fun, and I think those will pop up elsewhere, and I will just knock on someone's door and say 'Where are the vets?' If you do that as well, I find that they like to include you, and you always get very interesting questions from people that say 'oh I've never thought about that', but they've got medics as well who will go out and do point-of-care testing in homes and that sort of stuff. Again, we do some

home visits, so we have some diagnostic kits we can take home, take out and do that in the homes, you know. When we do those sorts of visits there are really interesting things that are happening in the human medical side that we can also incorporate and say, let's use this.

IB: You've touched on something actually which would be another fantastic area of research, which is looking for biomarkers that in humans. Procalcitonin levels go up with pneumonia, so some hospitals are using Procalcitonin measurements to justify whether someone with respiratory signs gets antibiotics or not.

There's people developing urinary tests where within half an hour, you can do a colour change to see if there's bacteria in the urine, debate whether you treat it with asymptomatic, but looking for those quick tests that in the consultation can justify not giving antibiotics would be a massive tool.

SH: Quick and cheap.

IB: Well, cheap, that's the challenge!

DS: It's making sure these new developments make their way across. I don't know if you've heard of the Longitude Prize, which is this idea of creating a point-of-care diagnostic test for resistance, which…it's got an impossible set of guidelines deliberately, so it has to be not using electricity, I think under a dollar a test, needs to be less than thirty minutes. So it's amazing.

KR: But if you win it you get a million pounds or something!

DS: The idea is that they don't expect anyone to get that, but by reaching to the top, you will get something close.

IB: Absolutely.

DS: It's just making sure those ideas…

KR: 'Cause it will get faster and it will get cheaper and there will be more of them if the demand is there.

SH: I think you have touched on something there, in terms of the community approach can be very powerful. So there are lots of people that are very influenced by what's happening in their own community and what the members of their community, what messages are they getting, and sharing it amongst themselves, whereas some national headlines, guidelines, expectations, whatever, doesn't land.

People influencing each other within communities to not ask for antibiotics or gaining that understanding why it's not being given, is probably an area we could and should lever quite a lot more to get where we need to.

KR: In Gloucestershire we had some students, we had a competition, we got students to produce a message that has gone on the back of buses, and throughout the community, and part of that because of the 'One Health' issue is 'wash your hands after you touch your pets, this is a good idea'.

And that was because I was sitting on that committee they said, 'It's 'One Health' and we really want One Health, so what can you tell us about One Health, what is

probably going to resound with members of our community?' This is just quite a good biosecurity thing and preventative measure, so that went on the…

CM: So it's not just stewardship practising in practice, it's being a community champion.

IB: Yeah, and that's something you could kind of challenge. Other organisations are doing a lot of good work focused on vets, but actually, don't want to name names to drop them in it, but large groups of organisations or large groups of practices, we could challenge them to actively promote responsible use in their pets.

DS: I guess it's that broader thing, the responsible use – it's about public trust in vets. If we're seen as community champions who are as focused on public health as on veterinary health, that's...

CM: That's a good point.

IB: That's really cool.

CM: I think that's a really good place to finish this chat on. Thank you so much for your input, that was really exciting, I think I want to go back to practice!

All: [laughter]

LC: A great many thanks to all our participants today: Christine Middlemiss, Kristen Reyher, Ian Battersby, David Singleton and Steve Howard.

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