**Online table I: Extended examples of network associated system factors influencing clinicians’ antibiotic prescribing**

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| **Feature** | **Network** | **Extract** | **Extract number in manuscript** |
| Access to antibiotics | Barcelona | *“It happens very often, ‘Doctor, I’ve already taken Clamoxyl’. Well then you tell him, ‘Very well, if you decide that…I would tell you not to take it, but well’. Or the great majority has antibiotics at home and in the chemist, they can go there directly and …the chemist will prescribe antibiotics…it happens very often” (Barcelona 31)* | 1 |
| Barcelona | *“Patients see other centres and private physicians and come with antibiotic schedules and you examine it and think I wouldn’t have indicated antibiotic but you do it” (Barcelona 493)* | N/A |
| Milan | *“Self-prescriptions. This is an important issue. Many patients call you saying they’ve been taking an antibiotic for the past three days… maybe given by the chemist, or something they had at home. In these cases, based on the symptoms, you wouldn’t have given an antibiotic” (Milan 51)* | *2* |
| Milan | *“There’s a lot of self-medication with antibiotics. They might come in because they’ve been ill for three days. After you examine them they ask “could you prescribe me an antibiotic?”. You might reply “I don’t think it will be necessary” and then they come up with “well I’ve been taking an antibiotic for the last three days”” (Milan 23)* | N/A |
| Systems to reduce patient expectations | Antwerp | *"That government campaign against antibiotics, that sure is terrific, because before that you really had to put a lot more energy in the people, and now, the young people, they are all up-to-date uh […] They really come in and say like: “if it is not necessary, no antibiotics”, uh. Like that uh, that’s really easy” (Antwerp 35)* | 3 |
| Antwerp | *“But to most of the people who do understand it, you almost don’t have to explain it anymore, because there have been so many campaigns, here in Belgium, that most of the people, er, are starting to understand after all, gradually” (Antwerp 49)* | N/A |
| Southampton | *“For many years we’ve tried to explain to patients that having antibiotics won’t necessarily get them better… I think what’s changed is that patients are starting to understand that more” (Southampton 29)* | 4 |
| Southampton | *“I think that we’re in a climate where antibiotic prescribing is reducing as people… I think that patients are more amenable to the idea that an antibiotic may not be necessary” (Southampton 43)* | N/A |
| Lack of consistent guidelines | Balatonfüred | *“There are ... five types of protocol, but this is the minimum. Let’s say there’s one by the IBR ((special Hungarian health care association)), there is an advice by the Infektológiai Társaság ((Infectologists’ Association)), according to this there is this National Guideline, but which should be followed can depend on the pharmaceutical firm giving let’s say training about antibiotics. […] National guideline?…I couldn’t tell which is equivalent to that one” (Balatonfüred 370)* | 5 |
| Balatonfüred | *“Protocols, should be elaborated, which let’s say would give national guidelines, and to make these available for everyone. The physicians, the GPs, the doctors from different fields, the ones working on pulmonological departments (should know) which steps to follow” (Balatonfüred 384)* | 6 |
| Łódź | *“I try to manage according to guidelines […] I would like always to apply to them, but not always I succeed […]These data from which I probably use refer to some foreign populations, and this is not, let us say, my population, Polish or mine here local. So here I perceive this deficiency” (Łódź 78)* | 7 |
| Łódź | *“...In…such publications, if I saw the divergence with this, what is going on in practice, in life, then I will admit that I not very willingly apply these recommendations…I take them into account and I know them, but I not always willingly apply to them because often there is certain divergence, especially in this range, that these data propose usually more gentle treatment than I consider is necessary” (Lodz 64)* | N/A |

**Online table II: Extended examples of clinician characteristics influencing clinicians’ antibiotic prescribing**

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| **Feature** | **Description** | **Extract** | **Extract number in manuscript** |
| Clinicians’ professional ethos | Receptiveness | *“Old habits die hard [...] even when new guidelines are implemented I find it difficult to put these into practice. I am so used to the old ways” (Utrecht 72)* | 7 |
| *"Just like other doctors I am reasonably conservative, and I change with difficulty. So, that someone needs to point that out to me, before I grasp it myself" (Antwerp 21)* | N/A |
| *“I think one has to be very open minded and receptive of new information provided it’s good information” (Cardiff 14)* | N/A |
| School of thought | *“I’ve always been a bit reserved, because my Professor back ... already made us understand good and proper that you have to be very careful with that stuff ((antibiotics))” (Antwerp 177)* | 8 |
| *“I came very much from the older school of thought, you know, irrespective of what the patient presents with and how well they are, antibiotics is always a good idea because it acts as a placebo if not as the cure […] So yeah I did as a registrar that’s probably prescribing a lot more. But then again you know experience comes in to it and confidence and that… so I would say I definitely think in terms of … when I prescribe has definitely changed in the last number of years” (Cardiff 98)* | N/A |
| *“Before it was, well in my case right, well I don’t know, for a common cold well maybe you started to treat with an antibiotic and that was because it was the usual practice. I’m talking about ten or fifteen years ago, eh. Now, no, I haven’t prescribed so many antibiotics in years” (Barcelona 73)* | N/A |
| Self belief in decision making | Tolerating uncertainty | *“I think what also plays a role is the feeling of the doctor, it feels somewhat safer to let the patient go home with antibiotics than without antibiotics […] Well, you think, if there still is something wrong and it actually is a bacterial infection, of which someone could also die” (Utrecht 16)* | 9 |
| *“I think that I should maybe more liberally approach older patients, that I should maybe …more often order him to report for re-control and not at once, with fear, prescribe antibiotics” (Lodz 50)* | N/A |
| *“Defensive medicine is very common. Defensive medicine because we […] scared to make decisions that turn out to be wrong. You could lose patients as well, in those areas where there is competition about the patients” (Tromsø 319)* | N/A |
| Confidence | *“I struggle to an extent with my confidence at not giving antibiotics and with patient expectation to give antibiotics. Um, but I think that we’re in a climate where antibiotic prescribing is reducing as people [...] are more amenable to the idea that an antibiotic may not be necessary. But I think the threshold at which one uses them is still something that I feel that I slightly struggle with”( Southampton 43)* | 10 |
| *“When one is younger one is usually, maybe correctly so, or maybe incorrectly so, one is a bit more uncertain and tends to rely more heavily on diagnostic testing. As one gets older one tends to be a bit more self-confident and may reason ‘well I’ve seen so many similar situations before, I’m fairly sure of my diagnosis’” (Milan 65)* | 11 |
| Commitment to shared decision making | Sharing responsibility | *“The image of the doctor really has changed over time, hasn’t it?! I can tell the patient what I think would be the correct treatment, but I can’t force them…The patient is the one who decides” (Barcelona 115)* | 12 |
| *“I think we’ve also moved on…including your patient in the options of treatment and things like that, you know, that’s their option well you know if it’s against medical advice again you know, they take responsibility, they understand what they’re doing. […] An’ I also tell them I say “this is your responsibility, if you take these antibiotics you know what the implications are and it’s the responsibility you take”. It no longer becomes my responsibility” (Cardiff 98)* | N/A |
| Confrontation threshold | *“If patients really insist and if you will really end up with an unpleasant conflict if you do not give in, then you do give way every once and a while” (Utrecht 100)* | 13 |
| *“Sometimes I’ll have that whole fight about not giving antibiotics…and I feel sometimes practically I feel like crying ‘cause they’re so horrible that some days I just don’t want that argument and I’ll back out of it” (Cardiff 56)* | N/A |
| Emotional investment | *“At the beginning …I had a greater enthusiasm in dissuading the patient…in explaining him that the antibiotic is not necessary with relation to what I do now” (Łódź 78)* | 14 |
| *"Some say give me antibiotics…I still do the effort of explaining it to them, like I say you mean antibiotics, don’t you. But in this case it’s more likely that they will cure you later instead of sooner. They don’t help for this kind of infections, viruses, and if you give antibiotics for things they are not meant for, then, in the end, you only suffer from the side effects and you’ll be sick even longer…But then you really have to bother to explain, ‘cause it’s far more difficult not to prescribe antibiotics, than to prescribe them” (Antwerp 77)* | 15 |