



# Exploring the implementation of interventions to reduce antibiotic use (ENACT study) Second level title if required

## Appendix D

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## Appendix D. Influences on antibiotic prescribing identified in qualitative studies

**Table D1. Influences on clinician’s prescribing decision with barriers and facilitators to appropriate prescribing**

**Note**

This table was constructed based on the data from the qualitative studies reviewed. Empty cells mean that there was no data that would indicate that the particular influence was reported as a barrier or facilitator (although the influence could be a barrier or facilitator). Where the same content appears in the ‘barriers’ and ‘facilitators’ columns it indicates that the data was inconclusive – suggesting that the influence could work either way.

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 1: Evidence and education	<ul style="list-style-type: none"> <li>• evidence and guidelines, including balancing evidence with clinical experience</li> </ul>	<ul style="list-style-type: none"> <li>• lack of awareness or knowledge of evidence or guidelines</li> <li>• responding to other influences (for example, patient, experience) over evidence or guidelines</li> <li>• lack of trust in guidelines (for example, perceiving them as driven by cost or pharma companies)</li> <li>• misunderstanding recommendations (for</li> </ul>	<ul style="list-style-type: none"> <li>• availability of (clear) evidence base and guidelines</li> <li>• awareness of evidence and guidelines</li> <li>• wanting to follow guidelines as best practice</li> <li>• trust in (objectivity of) recommendations</li> <li>• adopting guidelines or evidence as a standard practice</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
		example, switching antibiotic rather than reducing)	
Theme 1: Evidence and education	<ul style="list-style-type: none"> <li>• peer discussion and learning, including learning during interactive educational sessions, practice meetings or directly talking to colleagues in practice</li> </ul>		<ul style="list-style-type: none"> <li>• advice from a colleague when uncertain or to reinforce the decision to patient (second opinion); peer validation of prescribing decisions</li> <li>• learning from peers on whether they can improve and how; learning about alternative prescribing techniques (for example, through interactive meetings with GPs)</li> </ul>
Theme 1: Evidence and education	<ul style="list-style-type: none"> <li>• GP training</li> </ul>		<ul style="list-style-type: none"> <li>• GP training about appropriate antibiotic prescribing</li> </ul>
Theme 1: Evidence and education	<ul style="list-style-type: none"> <li>• advice from and influence of others</li> </ul>		<ul style="list-style-type: none"> <li>• advice from relevant experts (for example, paediatricians, policy makers, local microbiologists, local prescribing advisors)</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 2: Clinical experience	<ul style="list-style-type: none"> <li>clinical experience and confidence and memorable cases impacting on current practice</li> </ul>	<ul style="list-style-type: none"> <li>perceived insufficient relevant experience (for example, in assessing children); lack of confidence</li> <li>lack of or limited exposure to very sick patients (for example, in general practice, nowadays)</li> <li>trust in own experience (especially negative) more than evidence for when to prescribe</li> </ul>	<ul style="list-style-type: none"> <li>relevant clinical experience (for example, with children); confidence in making prescribing decisions based on this experience</li> <li>confidence in ability to identify serious illness based on experience and exposure to very sick patients; belief they are less likely to miss something serious</li> </ul>
Theme 2: Clinical experience	<ul style="list-style-type: none"> <li>experience of and concern about adverse events resulting from prescribing decisions</li> </ul>	<ul style="list-style-type: none"> <li>negative experience (own or anecdotal) of not prescribing antibiotic (for example, complications, hospitalizations, treatment failure with narrow-spectrum antibiotic); concern about potential negative consequences of not prescribing antibiotics</li> </ul>	<ul style="list-style-type: none"> <li>negative experience of prescribing antibiotic; concern about side effects and antimicrobial resistance (for example, C.Diff) resulting from prescribing antibiotics</li> </ul>
Theme 2: Clinical experience	<ul style="list-style-type: none"> <li>GP's preference for certain antibiotic; GP's perception of</li> </ul>	<ul style="list-style-type: none"> <li>GP's preference for certain antibiotic (for example,</li> </ul>	

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
	<p>how effective and well-tolerated certain antibiotic (for example, broad-spectrum)</p>	<p>broad-spectrum, even if they may be inappropriate)</p>	
<p>Theme 3: Clinical assessment</p>	<ul style="list-style-type: none"> <li>• clinical assessment of signs and symptoms and making a diagnosis, including perceived (no) clinical need for antibiotic</li> </ul>	<ul style="list-style-type: none"> <li>• lower threshold for giving antibiotic based on certain signs and symptoms despite lack of evidence or certainty that they help identify bacterial or serious infection (for example, auscultation, fever duration, sputum colour)</li> </ul>	<ul style="list-style-type: none"> <li>• interpreting signs and symptoms as indicative of a need or no need for antibiotic; belief that antibiotic are beneficial in some cases</li> </ul>
<p>Theme 3: Clinical assessment</p>	<ul style="list-style-type: none"> <li>• clinical uncertainty about illness aetiology, severity and/or progression, including:                             <ul style="list-style-type: none"> <li>• uncertainty whether illness is viral or bacterial; sensitivities not available at the point of care or delayed</li> <li>• highest uncertainty in patients with</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• clinical uncertainty about illness aetiology (whether it is viral or bacterial), severity and/or progression (whether illness is self-limiting or might lead to complications)</li> </ul>	

Overarching theme	Influences on antibiotic prescribing decisions include:	Barriers to appropriate antibiotic prescribing include:	Facilitators of appropriate antibiotic prescribing include:
	<p>'intermediate' illness severity</p> <ul style="list-style-type: none"> <li>• concern about missing serious illness</li> <li>• low tolerance of clinical uncertainty and risk</li> <li>• prescribing 'just in case'</li> </ul>		
Theme 3: Clinical assessment	<ul style="list-style-type: none"> <li>• patient's risk of complications (or poor outcomes, including:                             <ul style="list-style-type: none"> <li>• patient's risk factors, or vulnerability to complications, for example, comorbidities, prematurity, older or young age, reporter allergies to antibiotic</li> <li>• patient's medical history of developing complications</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• perceived patient risk of complications or poor outcomes, even if antibiotic might not be needed</li> </ul>	<ul style="list-style-type: none"> <li>• perceived patient risk of complications based on comorbidities and medical history</li> </ul>
Theme 3: Clinical assessment	<ul style="list-style-type: none"> <li>• patient's perception and presentation of illness, including:</li> </ul>	<ul style="list-style-type: none"> <li>• patient's or carer's concern about illness</li> </ul>	<ul style="list-style-type: none"> <li>• patient's or carer's concern about illness</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
	<ul style="list-style-type: none"> <li>• patient’s anxiety about illness (for example, over-anxious or exaggerating symptoms, anxious because of past experience, anxious because of how the illness impacts on patient’s life)</li> <li>• patient’s presentation of illness (‘patient’s or parent’s story’, patient’s report)</li> <li>• repeated consultations about the same illness episode</li> <li>• using prescription to reassure patient</li> </ul>		
Theme 3: Clinical assessment	<ul style="list-style-type: none"> <li>• access to patient’s medical records or history</li> </ul>	<ul style="list-style-type: none"> <li>• lack of access to patient’s medical records or history (for example, in OOH) leads to being overcautious and prescribing just in case</li> </ul>	

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 3: Clinical assessment	<ul style="list-style-type: none"> <li>• ‘gut feeling’ about the patient and their illness, including impressions or intuition about the patient and illness</li> </ul>	<ul style="list-style-type: none"> <li>• ‘gut feeling’ about the patient and their illness</li> </ul>	<ul style="list-style-type: none"> <li>• ‘gut feeling’ about the patient and their illness</li> </ul>
Theme 3: Clinical assessment	<ul style="list-style-type: none"> <li>• additional diagnostic information from testing</li> </ul>	<ul style="list-style-type: none"> <li>• lack of access to point of care diagnostic tests</li> <li>• concerns with over-reliance on diagnostic testing</li> <li>• misinterpreting or responding to misleading (coincidental) test results</li> <li>• prescribing antibiotic before receiving a test result (in response to patient expectation and concern about possible deterioration)</li> </ul>	<ul style="list-style-type: none"> <li>• access to point of care diagnostic information as an additional source of information helping reduce uncertainty and guide prescribing decision</li> </ul>
Theme 4: Knowledge and perceptions of the patient	<ul style="list-style-type: none"> <li>• prior knowledge of and familiarity with the patient</li> </ul>	<ul style="list-style-type: none"> <li>• prior knowledge of and familiarity with the patient</li> </ul>	<ul style="list-style-type: none"> <li>• prior knowledge of and familiarity with the patient</li> </ul>



<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 4: Knowledge and perceptions of the patient	<ul style="list-style-type: none"> <li>• perceptions of the patient, including:                             <ul style="list-style-type: none"> <li>• perceptions of patient's ability to understand GP's advice (including language skills)</li> <li>• patient's understanding of appropriate use of antibiotic and antimicrobial resistance</li> <li>• perception of a patient or carer being 'sensible' and responsible</li> <li>• perception of patient's or carer's ability to cope with and manage illness</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• GP's doubt whether a patient or carer is able to manage illness without antibiotic or re-consult if needed</li> </ul>	<ul style="list-style-type: none"> <li>• GP's perception of a patient or carer as 'sensible' and able to understand and follow GP's advice</li> </ul>
Theme 4: Knowledge and perceptions of the patient	<ul style="list-style-type: none"> <li>• ability to re-assess or follow-up the patient, including:                             <ul style="list-style-type: none"> <li>• practical ability to re-assess or follow-up (for example, in OOH)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• lack of ability to re-assess or follow-up the patient (for example, in OOH)</li> <li>• concern that patient might not re-consult if needed</li> </ul>	<ul style="list-style-type: none"> <li>• ability to re-assess or follow-up the patient if needed</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
	<ul style="list-style-type: none"> <li>• perception of whether the patient would re-consult if needed</li> </ul>		
Theme 4: Knowledge and perceptions of the patient	<ul style="list-style-type: none"> <li>• patient’s social factors, including:                             <ul style="list-style-type: none"> <li>• education, culture, language</li> <li>• living conditions, lifestyle, and their impact on immune system</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• perception of patient’s social circumstances as influencing their health and ability to get better without antibiotic</li> </ul>	<ul style="list-style-type: none"> <li>• perception of patient’s social circumstances as influencing their health and ability to get better without antibiotic</li> </ul>
Theme 5: Perceptions of patients’ expectations and satisfaction	<ul style="list-style-type: none"> <li>• perceptions of patient expectation for antibiotic</li> </ul>	<ul style="list-style-type: none"> <li>• prescribing antibiotic because of overt or perceived patient expectation for antibiotic (or certain type of antibiotic, even when it may be clinically inappropriate)</li> </ul>	<ul style="list-style-type: none"> <li>• reduced patients’ expectations for antibiotic; raising patient awareness about appropriate use</li> </ul>
Theme 5: Perceptions of patients’ expectations and satisfaction	<ul style="list-style-type: none"> <li>• preserving a good relationship with patient, patient satisfaction and avoiding conflict</li> </ul>	<ul style="list-style-type: none"> <li>• preserving a good relationship, patient satisfaction and avoiding conflict by prescribing</li> </ul>	<ul style="list-style-type: none"> <li>• ability to preserve a good relationship and patient satisfaction (in other ways than prescribing antibiotic, for example, conducting</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
		antibiotic (even if unnecessary)	thorough examination, providing explanation and reassurance)
Theme 5: Perceptions of patients' expectations and satisfaction	<ul style="list-style-type: none"> <li>• patient's preference for certain antibiotic, for example, based on past experience, allergy or intolerance</li> </ul>	<ul style="list-style-type: none"> <li>• wanting to improve adherence by prescribing antibiotic preferred by the patient (when inappropriate)</li> </ul>	
Theme 6: Communication skills and strategies	<ul style="list-style-type: none"> <li>• ability to elicit and manage patient's concerns and expectations, including 'consultation exchange'</li> </ul>	<ul style="list-style-type: none"> <li>• lack of ability to manage patient's expectations for antibiotic effectively</li> <li>• perception that advice alone (without a prescription) is insufficient to satisfy the perceived need for consultation exchange</li> </ul>	<ul style="list-style-type: none"> <li>• ability to elicit and address patient's concerns and expectations</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 6: Communication skills and strategies	<ul style="list-style-type: none"> <li>• ability to reassure and safety-net, including:                             <ul style="list-style-type: none"> <li>• validating illness</li> <li>• preparing a patient for a treatment decision (for example, thorough examination, running commentary, selection of how to describe findings of examination, normalizing symptoms)</li> <li>• projecting empathy</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>• ability to reassure a patient and provide safety-netting advice</li> <li>• ability to prepare a patient for, and justify, a decision whether to prescribe antibiotic or not</li> </ul>
Theme 6: Communication skills and strategies	<ul style="list-style-type: none"> <li>• perceived importance of shared decision making</li> </ul>	<ul style="list-style-type: none"> <li>• perceived importance of shared decision making</li> </ul>	<ul style="list-style-type: none"> <li>• perceived importance of shared decision making</li> </ul>
Theme 6: Communication skills and strategies	<ul style="list-style-type: none"> <li>• ability and motivation to educate patients in consultations</li> </ul>		<ul style="list-style-type: none"> <li>• ability to educate patients in consultations (by explaining about infections, symptoms and antibiotic)</li> </ul>
Theme 7: time and workload	<ul style="list-style-type: none"> <li>• timing of consultation and access to GP or medical services</li> </ul>	<ul style="list-style-type: none"> <li>• limited access to GP or medical services (lowering threshold for antibiotic prescribing, for example,</li> </ul>	

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
		before weekend or bank holiday, in OOH)	
Theme 7: time and workload	<ul style="list-style-type: none"> <li>time pressure and workload</li> </ul>	<ul style="list-style-type: none"> <li>(perception of) time pressure and workload (prescribing as a quicker way to close a consultation than educating or explaining when under time pressure)</li> <li>wanting to prevent re-consultations by giving a prescription</li> </ul>	<ul style="list-style-type: none"> <li>wanting to save time and prevent future consultations by investing time in educating patients about self-care of self-limiting illnesses</li> </ul>
Theme 7: time and workload	<ul style="list-style-type: none"> <li>consultation length.</li> </ul>	<ul style="list-style-type: none"> <li>(perception of) Insufficient consultation length to explain non-antibiotic decision and/or to educate and reassure patients</li> </ul>	<ul style="list-style-type: none"> <li>(perception of) Sufficient consultation length to examine a patient and explain non-antibiotic prescription and to educate and reassure patients</li> </ul>
Theme 8: Perceptions of professional role and ethos	<ul style="list-style-type: none"> <li>perceptions of professional role and ethos</li> </ul>	<ul style="list-style-type: none"> <li>not embracing change, preference for well-established practices and habits</li> <li>perceiving a professional role to treat the patient</li> </ul>	<ul style="list-style-type: none"> <li>ethos of embracing change</li> <li>wanting to be a good professional (doing the right thing by following prescribing guidance)</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
		<p>holistically by considering factors other than clinical assessment (used to justify inappropriate prescribing)</p> <ul style="list-style-type: none"> <li>• fear of missing a serious illness perceived as a threat to professional expertise</li> <li>• lack of (feeling of) accountability for own prescribing (as specific to one's role)</li> <li>• working according to protocol and guidelines (as part of a professional role)</li> <li>• perceived lack of professional authority (of nurse prescribers, leading to patients not trusting their decisions and needing clear justifications for prescribing decisions)</li> <li>• perceived importance of shared decision making (as part of a professional role)</li> </ul>	<ul style="list-style-type: none"> <li>• perceiving self-care advice and patient education as central to the professional role</li> <li>• working according to protocol and guidelines (as part of a professional role)</li> <li>• perceived lack of professional authority (of nurse prescribers, leading to patients not trusting their decisions and needing clear justifications for prescribing decisions)</li> <li>• perceived importance of shared decision making (as part of a professional role)</li> </ul>

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 9: Awareness and perceptions of responsibility for antimicrobial resistance	<ul style="list-style-type: none"> <li>• prioritizing immediate pressures or long-term consequences, including:</li> <li>• long-term consequences of antimicrobial resistance, consultation rates</li> <li>• immediate pressures, for example, patient expectations</li> </ul>	<ul style="list-style-type: none"> <li>• responding to immediate pressures (for example, patient in front) over long-term consequences of antimicrobial resistance</li> </ul>	<ul style="list-style-type: none"> <li>• responding to long-term consequences of antimicrobial resistance over immediate pressures (for example, patient in front)</li> </ul>
Theme 9: Awareness and perceptions of responsibility for antimicrobial resistance	<ul style="list-style-type: none"> <li>• awareness or knowledge of and attitude to antimicrobial resistance and to prudent antibiotic prescribing, including perception of a link between prescribing and antimicrobial resistance</li> </ul>	<ul style="list-style-type: none"> <li>• doubt about the impact of one's or GPs' prescribing on antimicrobial resistance</li> </ul>	<ul style="list-style-type: none"> <li>• awareness or knowledge of and concern about antimicrobial resistance</li> <li>• belief that GPs' antibiotic prescribing meaningfully contributes to antimicrobial resistance</li> </ul>
Theme 10: Monitoring, feedback and accountability	<ul style="list-style-type: none"> <li>• monitoring and auditing prescribing.</li> </ul>		<ul style="list-style-type: none"> <li>• having antibiotic prescribing monitored and audited</li> </ul>
Theme 10: Monitoring, feedback and accountability	<ul style="list-style-type: none"> <li>• feedback on prescribing</li> </ul>		<ul style="list-style-type: none"> <li>• receiving feedback on prescribing</li> </ul>
Theme 10: Monitoring, feedback and accountability	<ul style="list-style-type: none"> <li>• accountability for own prescribing</li> </ul>	<ul style="list-style-type: none"> <li>• lack of (feeling of) accountability for own prescribing</li> </ul>	

<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 11: Perceptions of own and others' prescribing	<ul style="list-style-type: none"> <li>perceptions of own prescribing (compared to others).</li> </ul>	<ul style="list-style-type: none"> <li>perceptions of own prescribing (compared to others) and feeling comfortable with own prescribing</li> </ul>	<ul style="list-style-type: none"> <li>perceptions of own prescribing (compared to others) and feeling comfortable with own prescribing</li> </ul>
Theme 11: Perceptions of own and others' prescribing	<ul style="list-style-type: none"> <li>consistency of approach to antibiotic prescribing, including practice-wide approach or protocol (one reference to negative consequences of having a practice-wide protocol that involved not prescribing antibiotic for sore throats which resulted in increased negative consequences and was then abandoned)</li> </ul>	<ul style="list-style-type: none"> <li>(perceptions of) inconsistent approaches to antibiotic prescribing (between practice staff or between organisations)</li> </ul>	
Theme 12: Costs associated with prescribing	<ul style="list-style-type: none"> <li>costs associated with antibiotic prescribing</li> </ul>	<ul style="list-style-type: none"> <li>perception that pressure to change prescribing was driven by cost rather than clinical considerations</li> <li>perception that prescribing antibiotic saves costs of hospital admissions</li> </ul>	<ul style="list-style-type: none"> <li>perception that inappropriate prescribing of antibiotic adds costs (and lower prescribing reduced costs)</li> </ul>



<b>Overarching theme</b>	<b>Influences on antibiotic prescribing decisions include:</b>	<b>Barriers to appropriate antibiotic prescribing include:</b>	<b>Facilitators of appropriate antibiotic prescribing include:</b>
Theme 13: Legal issues	<ul style="list-style-type: none"> <li>concern with legal issues</li> </ul>	<ul style="list-style-type: none"> <li>concern with legal issues or patient complaints (resulting from risks of not prescribing antibiotic)</li> </ul>	
Theme 14: Attitudes to and use of antimicrobial stewardship strategies	<ul style="list-style-type: none"> <li>views on and use of delayed prescriptions</li> </ul>	<ul style="list-style-type: none"> <li>belief that delayed prescribing is not an effective strategy for appropriate or prudent antibiotic prescribing</li> <li>perception that patients use delayed prescriptions inappropriately (lack of feedback on how patients use delayed prescriptions)</li> </ul>	<ul style="list-style-type: none"> <li>perception that delayed prescribing can be helpful (for different reasons and in different situations)</li> </ul>
Theme 14: Attitudes to and use of antimicrobial stewardship strategies	<ul style="list-style-type: none"> <li>use of patient leaflets</li> </ul>		<ul style="list-style-type: none"> <li>access to and use of patient leaflets (helping to explain no-antibiotic prescribing decision and provide advice)</li> </ul>
Theme 14: Attitudes to and use of antimicrobial stewardship strategies	<ul style="list-style-type: none"> <li>use of financial incentives</li> </ul>		<ul style="list-style-type: none"> <li>use of financial incentives to change antibiotic prescribing</li> </ul>

**Table D2. Barriers and facilitators to appropriate antibiotic prescribing within each TDF domain (presented in ranking order)**

**Notes**

Column 3: Either (barrier or facilitator) was used to indicate that the data identified in the qualitative studies did not allow to state whether the influence was a barrier or a facilitator.

Column 5: ‘Authors’ were used to indicate that the quotes were the study authors’ text and interpretations of their data, whereas ‘GP’ or ‘nurse’ were used to indicate that the quotes were direct quotes from study participants. Only one study (Williams and others 2017) was conducted in an out of hours setting. Whenever the barrier or facilitator was reported in OOH, a quote from Williams and others 2017 was provided in addition to a quote from a GP practice.

**Abbreviations used in the table**

AMR = antimicrobial resistance, GP = general practitioner, OOH = out-of-hours, NP = nurse practitioner, TDF = Theoretical Domains Framework.

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Beliefs about consequences	Evidence and guidelines	Wanting to follow guidelines as best practice	Facilitator	3	Most GPs found guidelines helpful, with some reporting that they made them feel “safer” because they were following recommended practice... [Authors, general practice, Tonkin-Crine 2011]
Beliefs about consequences	Evidence and guidelines	Responding to other influences (for example	Barrier	3	Some GPs felt that prescribing antibiotics not according to

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
		patient, experience) over evidence or guidelines			<p>guidelines was justified when they felt that this might be in the best interests of an individual patient. These tended to be GPs from higher prescribing fluoroquinolone practices. They often argued this on the basis that the evidence base for these guidelines was flawed, since clinical trial populations were not like their patients who frequently had greater co-morbidity and worse living conditions: GP19: “In the end, the patient [in front of you] is not the guy in the trial. You have to think that way.... Your duty is to him, not to all the trials, not to all the guidelines from NICE [National Institute of Clinical Excellence] or whoever, in the end your first duty is to them. You could take notice of the trials but in the end you’ve got to consider the</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					patient as an individual.” (High fluoroquinolone practice). [GP, general practice, Wood 2007]
Beliefs about consequences	Evidence and guidelines	Trust in (objectivity of) recommendations	Facilitator	2	All GPs stated that providing a clear evidence base strengthened their trust in recommendations. [Authors, general practice, Tonkin-Crine 2011]
Beliefs about consequences	Evidence and guidelines	Lack of trust in guidelines	Barrier	3	GPs accepted the content of guidelines and were supportive of efforts to tackle antibiotic resistance, but did not always trust specific recommendations within guidelines. GPs were suspicious about the influence of cost over clinical considerations: “I’ve been in on meetings, being an ex-prescribing lead, where it’s so heavily biased in the financial direction that I wondered if clinical judgment and clinical practice were

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					being thought about at all.” [GP, general practice, Tonkin-Crine 2011]
Beliefs about consequences	Clinical experience and confidence	Trust in own experience more than evidence for when to prescribe	Barrier	6	“I feel I am prescribing in response to what people are actually like, and you know not all will be satisfied, or you know some people will not be satisfied unless they get their antibiotic and I know who those people are, so when they come in I give them antibiotics. I think research into this has been helpful, but I’ve learnt a lot from the hundreds of patients I’ve seen with sore throats too. People aren’t always as research would have them.” [GP, general practice, Kumar 2003]
Beliefs about consequences	Experience of and concern about	Negative experience of prescribing antibiotic; concern about side effects	Facilitator	2	“I think down to my own experience and where I feel I am in my practice compared to my peers, it’s quite

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
	adverse events resulting from	and AMR resulting from prescribing antibiotics			interesting how I use antibiotics quite a lot less and I wonder if that's because I have actually seen people die in hospital, in my career, from bacterial, you know antibiotic resistance and C.Diff diarrhoea and things like that. [...] And I've noticed that talking to my more senior colleagues who are probably 10, 20 years my senior, they've never seen the sort of deaths that I've discussed in hospital. So I think that has a big effect on what I do." [GP, general practice, Ashdown 2016]
Beliefs about consequences	Experience of and concern about adverse events resulting from prescribing decisions	Negative experience (own or anecdotal) of not prescribing antibiotic; concern about potential negative consequences of not prescribing	Barrier	5	"I mean, I think I probably prescribe slightly more often than the standard, I think I'm probably on that end of it. And it's, it's quite an interesting question as to why you do that. (...) however much

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					<p>research you read, I think your own personal experience always has more, (...) you only need one adult who (...) had an appalling bronchial pneumonia, when you didn't prescribe, to, to actually make you probably over prescribe."</p> <p>[GP, general practice, Cabral 2016]</p>
Beliefs about consequences	GP's preference for certain antibiotic (perception or experience of how effective and well-tolerated they are)	GP's preference for certain antibiotic (even if they may be inappropriate)	Barrier	1	<p>"I have a great faith in them [fluroquinolones] because most of the time I have seen it, it works very well. Especially I have found that they are great for the skin infections and for the UTIs. And for say the chest infection as well."</p> <p>[GP, general practice, Wood 2007]</p>
Beliefs about consequences	Clinical assessment of signs and symptoms, making a diagnosis	Interpreting signs and symptoms as indicative of a need or no need for antibiotic; belief that	Facilitator	9	<p>HCPs reported that perceived clinical need was the most common reason for prescribing antibiotics. They determined clinical need using 2 diagnostic stages: first a</p>

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		antibiotic are beneficial or needed in some cases			<p>rapid initial assessment based on pattern recognition at first sight of the child and then a more formal deductive assessment process. (...) "Probably if I gave them [antibiotics] out would be on um children that had a fever, maybe 38.5, miserable despite having regular Calpol and Nurofen, obviously on chest signs, if they were coughing up any muck, and it had to be a colour, I always have in my head like a little colour flow chart in my head, the darker the colour the more likely to be bacterium than it is if it was pale green or yellow or clear."                      [Nurse, general practice, Horwood 2016]</p>
Beliefs about consequences	Clinical assessment of signs and	Lower threshold for giving antibiotic based on certain	Barrier	2	However, one clinician questioned the value of relying on auscultation



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	symptoms, making a diagnosis	signs and symptoms despite lack of evidence or certainty that they help identify bacterial or serious infection			in deciding whether to prescribe: “It’s a difficult issue because I don’t know that we really know how accurate even lung signs are as a predictor so, but you kind of get the feeling if somebody has quite focal signs and are more unwell then. I think my threshold for giving antibiotics at that stage might, would be lower”. [GP, general practice, Brookes-Howell 2012a]
Beliefs about consequences	Clinical uncertainty about illness aetiology, severity and/or progression	Clinical uncertainty about illness aetiology, severity and/or progression	Barrier	8	‘I think it’s just hugely difficult... It’s a complete nightmare... you sit there in practice and you think, ‘Well, how on earth can you decide whether it’s viral or not?’ [GP, general practice, Ashdown 2016] “There are some that are in a grey area that you’re sort of like, ‘Oh I’m

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					<p>not quite too sure.' ... it might be a bit of a bacterial infection, it might not be ... And in that case you may try antibiotics and see if they respond ... I would say that 80% of the children you see are well or it's a mild viral infection that you can self-manage. I'd say that maybe 5% of them are really unwell, and maybe there's sort of, I don't know, 10 to 15% kind of grey area."</p> <p>[GP, general practice, Horwood 2016]</p>
Beliefs about consequences	Additional diagnostic information from testing	Prescribing antibiotic before receiving a test result (in response to patient expectation and concern about deterioration)	Barrier	1	<p>However, many GPs felt their ability to select an antibiotic on the basis of the infecting agent was hampered by not having sensitivities available at the point of prescription, and consequently were required to prescribe empirically. Although urine samples</p>

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					<p>were frequently sent to the laboratory, sampling was far less frequent for other infections. Even when samples were sent, GPs felt under pressure to treat the patient immediately both because of patient expectation and their concern that delay would cause deterioration.</p> <p>[Authors, general practice, Wood 2007]</p>
Beliefs about consequences	Perceptions of the patient	GP's perception of a patient or carer as 'sensible' and able to understand and follow GP's advice	Facilitator	3	<p>If Lily's mother was seen as a 'sensible parent', this would probably affect how they incorporated the mother's opinion, and how much responsibility could be expected in monitoring the child for signs of deterioration and returning for further assessment. "I'm kind of, you know, if they're sick they need to be treated. If</p>

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					<p>they're not sick they need to be told to come back. And be given a lot of permission to do that and I'm forever saying 'If you're worried, I'm worried,' to patients, to Mums and Dads. To really underline you know, 'You're the world's expert,' is the other thing that I'm always forever saying, 'You're the world's expert on your child.'"                      [GP, general practice, Ashdown 2016]</p>
Beliefs about consequences	Perceptions of the patient	GP's doubt whether a patient or carer is able to manage illness without antibiotic or re-consult if needed	Barrier	4	Prescribers reported assessing patients to determine their awareness and understanding of the topic discussed within a consultation and that this assessment would influence their decision of whether or not to prescribe, particularly when dispensing a delayed antibiotic

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					<p>prescription. "I don't like really giving delay prescriptions unless I really feel that they can take on board the information about using that." [Nurse, OOH, Williams 2017]</p>
Beliefs about consequences	Ability to re-assess or follow-up the patient	Concern that patient might not re-consult if needed	Barrier	1	<p>A minority of HCPs said that, if they had concerns that a parent may not re-consult if their child deteriorated, even if provided with safety net advice, they would be more likely to prescribe antibiotics: "If I don't trust the mum to come back because she seems not very with it, but I'm not worried enough to admit the kid, I might be more inclined to antibiotics ... Just in case they don't come back, because I can't safety net properly with them." [GP, general practice, Horwood 2016]</p>

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Beliefs about consequences	Patient's preference for certain antibiotic	Wanting to improve adherence by prescribing antibiotic preferred by the patient (when inappropriate)	Barrier	1	<p>Patients expressing preferences for fluoroquinolones was particularly stressed by GPs from high fluoroquinolone prescribing practices. GPs also experienced difficulties when faced with patients reporting allergies to penicillin and intolerance to macrolides. Even if the reported allergy was not considered to be serious, some GPs were reluctant to risk prescribing antibiotics such as penicillin due to possible repercussions. They then felt that they had little other choice but to prescribe a broad-spectrum antibiotic such as a fluoroquinolone. GP12: "I think they're [fluoroquinolones] very well tolerated. And they certainly help compliance with them being either</p>

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					<p>once a day or twice a day.” [GP, general practice, Wood 2007]</p>
Beliefs about consequences	Time pressure and workload	Wanting to save time and prevent future consultations by investing time in educating patients about self-limiting illnesses	Facilitator	3	<p>Time to educate patients was described as crucial for managing expectations. Clear communication was recognised as requiring time and empowering patients to take control of their illness and preventing unnecessary future consultations or expectation for antibiotics. [Nurse, general practice, Courtenay 2017]</p> <p>“It’s a wasted opportunity I think if a patient comes, and you just don’t educate them properly, because then in future you are just making more work for yourself I think, they are more likely to come back.” [Nurse, general practice, Rowbotham 2012]</p>

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Beliefs about consequences	Time pressure and workload	Wanting to prevent re-consultations by giving a prescription	Barrier	1	GPs from high prescribing practices also described how prescribing a broader spectrum antibiotic lessened the need for the patient to re-present due to treatment failure. Coping with extremely busy surgeries and re-presenting patients was a major priority for GPs who stressed that demand from their practice population was particularly high: GP14: “A lot of it is down to the management of uncertainty and, you know, how cautious you are and how careful you want to be and how much you want to help your patients, without them getting worse in the interim period and how much you want to save further appointments, because the patient has to come back as their first treatment hasn’t



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					worked.” [GP, general practice, Wood 2007]
Beliefs about consequences	Prioritising immediate pressures or long-term consequences	Responding to long-term consequences of AMR over immediate pressures (for example, patient in front)	Facilitator	1	GPs from average fluoroquinolone prescribing practices were more concerned to reserve fluoroquinolones in case of resistance at some point in the future or for those with proven resistance now. GP34: “I am aware of resistance, potential resistance problems, with obviously broader spectrum antibiotics we are going to cause a problem if we keep using them too much, because we’ll run out of new antibiotics that will cover things. So I am very cautious, I do not give ciprofloxacin without thinking about the resistance element or can I use something simpler first.”

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					(Average fluoroquinolone practice) [GP, general practice, Wood 2007]
Beliefs about consequences	Prioritising immediate pressures or long-term consequences	Responding to immediate pressures (for example, patient in front) over long-term consequences of AMR	Barrier	1	Although some GPs from high prescribing practices acknowledged that future resistance to fluoroquinolones could be a problem, most of them justified their current liberal prescribing of fluoroquinolones on the basis of their duty to do the best for ‘the patient in front of them’, frequent treatment failure with narrower spectrum antibiotics, their desire to reduce re-presentations and their concern to prevent costly admissions to hospital which could result in additional problems for the patient and the health service. [GP, general practice, Wood 2007]

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Beliefs about consequences	Awareness or knowledge of and attitude to AMR and to prudent antibiotic prescribing	Belief that GPs' antibiotic prescribing meaningfully contributes to AMR	Facilitator	1	<p>"I am aware of resistance, potential resistance problems, with obviously broader spectrum antibiotics we are going to cause a problem if we keep using them too much, because we'll run out of new antibiotics that will cover things. So I am very cautious, I do not give ciprofloxacin without thinking about the resistance element or can I use something simpler first."</p> <p>[GP, general practice, Wood 2007]</p>
Beliefs about consequences	Awareness or knowledge of and attitude to AMR and to prudent antibiotic prescribing	Doubt about the impact of one's or the GPs' prescribing on AMR	Barrier	2	<p>"I don't think GPs contribute in any significant way, not really, and I think we are being targeted unfairly. Most GPs try desperately hard not to prescribe antibiotics, and it's really a fallacy to say we overprescribe. For instance, look at penicillin; look at how long this has been around. OK, tell me why it still</p>

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					<p>works in the community if we're supposed to be causing resistance through its overuse. My argument is that I saw much more co-amoxiclav being used in hospitals than I ever did in general practice. And now we hear about antibiotics being used willy-nilly in farming, so looking at our prescribing of penicillin for sore throat is nonsense to me."</p> <p>[GP, general practice, Kumar 2003]</p>
Beliefs about consequences	Costs associated with antibiotic prescribing	Perception that inappropriate prescribing of antibiotic adds costs (and lower prescribing reduced costs)	Facilitator	1	<p>GPs also discussed the cost to health services of antibiotic prescriptions and lengthy consultations, and how any demand for antibiotics needed to be weighed against consideration of the overall cost to the NHS or the organization for whom they worked. Financial comments came from</p>

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					<p>both GPs and NPs, in particular those in managerial or directorial positions who may be more inclined to consider costs to the organization as part of their everyday role. Participants reported that, even though consideration of cost factored into their decision making, they were unlikely to discuss this with the patient, and cost implications to the patient were not raised.</p> <p>[Authors, OOH, Williams 2017]</p>
Beliefs about consequences	Costs associated with antibiotic prescribing	Perception that pressure to change prescribing was driven by cost rather than clinical considerations	Barrier	1	<p>GPs were suspicious about the influence of cost over clinical considerations: "I've been in on meetings, being an ex-prescribing lead, where it's so heavily biased in the financial direction that I wondered if clinical judgment and clinical practice were being thought</p>

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					about at all.” [GP, general practice, Tonkin-Crine 2011]
Beliefs about consequences	Costs associated with antibiotic prescribing	Perception that prescribing antibiotic saves costs of hospital admissions	Barrier	1	Although cost was an explicit factor for a few GPs, the cost of antibiotics was mentioned by 9 GPs in relation to the cost of hospital admissions fluoroquinolones might prevent: GP25: “If you have a good antibiotic and you’re rational about it and you’ve got common sense approach to it, then why limit it? I mean if you can save a hospital admission, which is £250 a day, you can save a bed in a winter crisis.” [GP, general practice, Wood 2007]
Beliefs about consequences	Concern with legal issues	Concern with legal issues or patient complaints (resulting from risks of not prescribing antibiotic)	Barrier	5	They anticipated being held to account and feared legal action. “If there was a problem, and say that child became really acutely unwell,

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					<p>or at the worst, you know, died, um and things went to a litigation type thing, then I would have to be able to stand up and say that I gave the best advice that I did at the time.”                      [Nurse, general practice, Cabral 2015]</p> <p>“But, out of hours you’re just seeing them on that spot, you’re just seeing them once and somebody else is going to see them afterwards. Therefore you need to make the correct decision every time just once knowing that you might not see that patient, or the next thing you might see the GMC or the complaint. Therefore it just causes you more hassle for yourself eventually I guess. So that should be – yes, that should be the</p>

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					huge difference I guess.” [GP, OOH, Williams 2017]
Beliefs about consequences	Views on and use of delayed prescriptions	Belief that delayed prescribing can be helpful (for different reasons and in different situations)	Facilitator	5	On the whole, delayed prescribing was regarded positively, and general practitioners thought it could be used to manage diagnostic uncertainty, to reassure the patient, to prevent re-attendance, to reduce the likelihood of a patient taking the antibiotic, and to shorten consultation time. GP: “I try and give a delayed prescription where I can and say don’t use this for 48 hours, and if it hasn’t gone away or it’s getting worse then cash it in.” SK: “Why do you delay?” GP: “I think they always bounce back anyway, a lot of my... it tends to cut down on consultations. Because it’s easy to get in here anyway, they come in



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					<p>and out quite a lot. You know, sometimes several times during the course of the illness. It just cuts down contact with the doctor really, or unnecessary contact.”</p> <p>[GP, general practice, Kumar 2003]</p> <p>Delayed prescribing was reported by GPs and NPs as a useful aid for dealing with patient demand for antibiotics as well as encouraging shared decision making, shared management and providing a tool for safeguarding against further complications. “Assuming they are systemically well, and they’ve had a short duration of symptoms, I would nearly always try to persuade them that antibiotics aren’t needed, but for those patients who are difficult to persuade quite often I use a delayed or a deferred prescription</p>

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					and allow them to use their judgement as to whether they actually do need to go onto antibiotics at a later date.” [GP, OOH, Williams 2017]
Beliefs about consequences	Views on and use of delayed prescriptions	Belief that delayed prescribing is not helpful or effective	Barrier	2	One general practitioner questioned the effect of delayed prescribing on patients, suggesting its effects were no different from issuing a prescription for antibiotics: GP: “I don’t use delayed prescribing I feel that makes it just, well, you’re just hedging your bets. You are either sure of what you’re doing or you’re not sure of what you’re doing. So, if you see a sore throat you’re either saying you’re sure it’s viral and self-limiting and going to get better or you’re not.” [GP, general practice, Kumar 2003]

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Beliefs about consequences	Views on and use of delayed prescriptions	Perception that patients use delayed prescriptions inappropriately (linked to a lack of feedback on how patients use delayed prescriptions)	Barrier	1	Lack of feedback on what patients do with a delayed antibiotic prescription was described as a barrier to using the delayed strategy, owing to a perceived likelihood of the prescription being ‘cashed in’ against medical advice. “...we can’t follow the patients up, we don’t follow them through, we have no idea whether they actually follow the instructions for delaying the prescription or whether they actually go and cash in their prescription and start the antibiotics straightaway.” [Nurse, OOH, Williams 2017]
Beliefs about consequences	Patient’s risk of complications or poor outcomes	Perceived patient’s risk of complications or poor outcomes	Either	6	Although GPs suggested that comorbidity would lower their intervention threshold, it was rarely described as an important part of the assessment. GPs varied in

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					<p>terms of which specific comorbidities seemed most important.                      [Authors, general practice, Ashdown 2016]</p> <p>A major concern for NPs was the possibility of missing something important in the consultation, particularly for children or those with co-morbidities: “If patients are compromised immunologically, so they have got sort of an underlying immune disorder then I would probably error (sic) on the side of caution. Even if I wasn’t necessarily totally convinced, I would be worried not to treat.”                      [Nurse, general practice, Rowbotham 2012]</p>

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Beliefs about consequences	Patient's perception and presentation of illness	Patient's or carer's concern about illness	Either	8	<p>“If someone comes in really unwell—high temperature and looks toxic—and they’ve hardly ever been in to see me before, then I take them pretty seriously. They must have managed a lot of sore throats at home so it must be bad if they’ve come in, so I’m more ready to prescribe an antibiotic.”</p> <p>[GP, general practice, Kumar 2003]</p> <p>Participants reported that perceived patient anxiety in OOH, when compared with patients attending in-hours services, could lead to prescriber anxiety during a consultation influencing prescribing decisions, especially when considering more vulnerable patients such as children and the elderly. “Amongst parents particularly that concern that they</p>

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					<p>need to do something for their child and they have that anxiety that their child won't get better or will become very unwell. They bring that to the consultation saying, 'Here's my child. They're sick. I'm really worried about them. Do something for them please.' That fear perhaps that if you don't do something this might be the one child who got worse."</p> <p>[Nurse, OOH, Williams 2017]</p>
Beliefs about consequences	'Gut feeling' about the patient and their illness	'Gut feeling' about the patient and their illness	Either	3	<p>Clinicians revealed that sometimes they got 'a feeling' which could override the decision they would make purely based on the clinical factors. One clinician explained that absence of signs on auscultation might still prompt further action if they chose to rely on their intuition instead: "I can feel it in my bones. I</p>

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					<p>can listen to your lungs now and at this moment I don't have any signs of concern, but it doesn't give me enough certainty, maybe further examination is needed or let's give antibiotics now after all. It is a feeling of this is different from the routine.”</p> <p>[GP, general practice, Brookes-Howell 2012a]</p>
Beliefs about consequences	Patient's social factors	Perception of patient's social circumstances as influencing their health and ability to get better without antibiotic	Either	2	<p>General practitioners serving populations living in poor housing, in overcrowded conditions with poor nutrition or substance misuse (including alcohol) thought that these factors compromised people's immune function and increased their susceptibility to bacterial complications. The presence of adverse social factors lowered general practitioners'</p>

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					<p>threshold for prescribing antibiotics for sore throat. They were comfortable prescribing antibiotics for these reasons and explained how their practice was based on plausible biological assumptions, which linked poor diet with suboptimal immune function. They were less certain about the link between poor housing and immune function, although one explained it in the following terms: ‘I have great doubt, I mean, one of the, I mean, I confess the issue for me is generalisability of some of the work that’s been done. You can’t deny the differences between the comfortable middle class patients in the South [of England] and inner city Glasgow. I mean the thing that did it for me—I saw a slide on Aborigines and they’re in appalling</p>



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					social conditions, and they still got complications like mastoiditis. And I know you might say, 'Oh well it's genetics,' but honestly I believe that a lot of it is due to poor nutrition, poor housing conditions, and overcrowding. So I must admit these factors affect my prescribing." [GP, general practice, Kumar 2003]
Social influences	Peer discussion and learning	Advice from colleagues when uncertain or to reinforce the decision to patient (second opinion); peer validation of prescribing decisions	Facilitator	2	Participants also highlighted the value of peer support in dealing with the challenges of RTI consultations and reported that it was sometimes helpful to ask another NP (or GP) to reinforce the diagnosis and decision not to prescribe, or to provide a second opinion where there was diagnostic uncertainty. "If I have got somebody that I feel really, really won't go, without it [antibiotic

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					<p>prescription] then I get a colleague in and say will you listen to their chest and then we will reinforce it, so we work together here you see so that is why it works so well.”                      [Nurse, general practice, Rowbotham 2012]</p> <p>Peer discussion and education played an important role in supporting treatment decisions, as prescribers had the opportunity to discuss alternative prescribing techniques as well as to validate their own prescribing decisions.                      [Authors, OOH, Williams 2007]</p>
Social influences	Peer discussion and learning	Learning from peers on whether they can improve and how; learning about alternative prescribing techniques (for example,	Facilitator	2	The most popular intervention was educational meetings, with GPs showing great interest in their colleagues’ prescribing. There was a preference for small, interactive events where it was easy to ask

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		through interactive meetings with GPs)			questions and hear about others' experiences. (...) Many described the aim of meetings was to make peer comparisons and to learn whether their own prescribing could improve and how. Some felt this was useful for GPs whose initial training may have differed more widely from current guidelines. [Authors, general practice, Tonkin-Crine 2011]
Social influences	GP training	GP training teaching about appropriate antibiotic prescribing	Facilitator	2	The 'school of thought' that the clinician came from was also reported to have a bearing on management decisions. This seemed to be influenced by the training they had received. For example, in extract 8, a clinician explained that he had always been cautious about prescribing antibiotics due to the attitude of the

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					<p>Professor he had trained under as a medical student. However, this factor was not fixed, and clinicians often talked about how their beliefs had changed since qualification or in early practice. [Authors, general practice, Brookes-Howell 2012b]</p>
Social influences	Advice from and influence of others	Advice from and influence of relevant experts	Facilitator	3	<p>They identified external pressures, such as research, local prescribing advisors, and national reports, 11 that had influenced them to reduce antibiotic prescribing. (...) all general practitioners said their decision making was rational and systematic: informed by personal clinical experience and research evidence and influenced by advice from policy makers and local microbiologists.</p>

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					[Authors, general practice, Kumar 2003]
Social influences	Perceptions of patient expectation for antibiotic	Reduced patients' expectations for antibiotic; raising patient awareness about appropriate use	Facilitator	5	<p>Most HCPs described parent pressure for antibiotics as uncommon across all patient populations. They reported that parents did not necessarily expect antibiotics and those who did were usually satisfied with an explanation and reassurance: "...they're [parents] quite happy as long as you're reassured that you can't find anything that is definitely needing antibiotics."</p> <p>[GP, general practice, Horwood 2016]</p> <p>There were a number of elements of patient expectations that reportedly influenced the experience of antibiotic prescribing. Most practitioners reported high</p>

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					<p>perceived or explicitly reported patient expectations of antibiotic treatment in OOH services; however, a minority suggested that they were in fact seeing fewer cases of patient demand for antibiotics than in previous years. (...) Prescribers working in OOH highlighted how raising public awareness outside of the consultation can positively influence consultations. [Authors, OOH, Williams 2017]</p>
Social influences	Perceptions of patient expectation for antibiotic	Prescribing antibiotic because of overt or perceived patient expectation for antibiotic (or certain type of antibiotic, even when it may be clinically inappropriate)	Barrier	8	<p>One doctor who described himself as a low prescriber highlighted his difficulties in negotiating with patients who demanded antibiotics because they believed in their effectiveness. (...) Other general practitioners also highlighted that 5 to 10 minutes was not enough to</p>

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					<p>convince such patients. One said he resolved this tension by reminding himself of his holistic duty. SK: "What happens when patients come in and say I know you don't want to give me antibiotics but they always work for me and if I don't get them straight away I have to take time off work?" GP: "Yep, that happens and you do end up giving antibiotics for that. It's very difficult, and it's where the research doesn't help. Once patients have worked out what they want, to actually explain them out of it can be a long process." [GP, general practice, Kumar 2003]</p> <p>Many GPs explained how fluoroquinolones were popular with a range of patients due to the low incidence of side-effects and the</p>

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					<p>twice daily dosing. These factors had obvious benefits for patient compliance, particularly if the patient was elderly and on multiple medications, or a patient the GP believed would not take their medication consistently. Patients expressing preferences for fluoroquinolones was particularly stressed by GPs from high fluoroquinolone prescribing practices. GPs also experienced difficulties when faced with patients reporting allergies to penicillin and intolerance to macrolides. Even if the reported allergy was not considered to be serious, some GPs were reluctant to risk prescribing antibiotics such as penicillin due to possible repercussions. They then felt that they had little other choice but to</p>



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					prescribe a broad-spectrum antibiotic such as a fluoroquinolone. [Authors, general practice, Wood 2007]
Social influences	Ability to elicit and manage patient's concerns and expectations	Perception that advice alone (without a prescription) is insufficient to satisfy the perceived need for consultation exchange	Barrier	1	Acknowledging patient illness and any effort made to attend OOH was reported as an important aspect of care management negotiations and was closely linked to the perceived need for a consultation exchange, in which a patient expects something in return for their effort, and the clinician in turn feels they should do something for the patient in order to meet that expectation. Giving advice alone was not, in a lot of cases, perceived as sufficient. "Sometimes it's the perceived need to do something. Particularly if somebody has been through a telephone assessment, they've

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					<p>been given an appointment so they've been indicated, 'You need to be seen today.' They've made a journey. They've waited. They've been seen. They then expect to get something. So there's a great big sort of built-in expectation that is created by that process. That can translate then into the clinician then feeling that they need to give them something to make that journey worthwhile and to feel that they've got something that's going to help them get better."</p> <p>[Nurse, OOH, Williams 2017]</p>
Social influences	Monitoring and auditing prescribing	Having antibiotic prescribing monitored and audited	Facilitator	2	<p>Audit, feedback and/or supervision were reported to be very important in OOH prescribing as this was thought to help inform future prescribing decisions and this was common across both GP and NP</p>

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					<p>respondents. The amount of auditing described by some participants highlights that antibiotic prescribing is high on the OOH agenda. "...it's something that's a piece of priority work for me and my team here, so we're doing a lot of work with our prescribers, both in terms of auditing, so we understand how much prescribing's going on. We also are looking at appropriateness of prescribing, so auditing case notes against the local guidelines and providing feedback to prescribers about how they're doing. So it's high up on our agenda."</p> <p>[Nurse, OOH, Williams 2017]</p> <p>The organizational factors which had the strongest influence on choice of antibiotic were incentives</p>

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					<p>set by Local Health Boards (the Welsh equivalent of Primary Care Trusts), and audit visits from the Local Health Board prescribing advisors which were generally, but not universally, valued. [Authors, general practice, Wood 2007]</p>
Social influences	Feedback on prescribing	Receiving feedback on prescribing	Facilitator	2	<p>Audit, feedback and/or supervision were reported to be very important in OOH prescribing as this was thought to help inform future prescribing decisions and this was common across both GP and NP respondents. [Authors, OOH, Williams 2017] Prescribing feedback, where GPs received data on the number of prescriptions issued in a given period, was another intervention that was praised for its ability to</p>

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					<p>make comparisons. GPs felt it was influential in identifying whether they and their partners were prescribing more antibiotics than average: "I think ranking against other practices is very powerful, you know if you were to list influences of GPs, probably below money would come peer-group comparison."                      [GP, general practice, Tonkin-Crine 2011]</p>
Social influences	Accountability for own prescribing	Lack of (feeling of) accountability for own prescribing	Barrier	1	<p>A common perception across interviews with NPs was reports of their feeling more accountable for their prescribing than their GP counterparts. "...I just don't think [doctors] see that it's not a problem right now rather than the future. So, that one prescription doesn't really matter, do you know what I mean?"</p>

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					<p>There's no accountability for it and no one is going to pull them up five years down the line and say, 'You shouldn't have given that prescription', so the prescribing responsibility isn't there.. .part of being a responsible prescriber is sometimes not prescribing and I'll say that to my patients...it's not appropriate. It's not going to help. It's not going to help in the bigger picture at all'." (NP 13/1000, NHS OOH)</p> <p>GPs argued that their perception of accountability was linked to a lack of follow-up and a perceived need to 'do something' for the patient in the OOH setting.</p> <p>"I think you're more likely to get prescribed antibiotics in the out-of-hours setting. One, is</p>

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					<p>accountability, so you're not ever going to see that patient again in the out-of-hours setting. It's not really your issue. If you give them antibiotics and they go away, you can feel quite happy that you've done something..." (GP 17/1002, Private OOH)                      [Nurse, GP, OOH, Williams 2017]</p>
Social influences	Prior knowledge of and familiarity with the patient	Prior knowledge of and familiarity with the patient (or lack of it)	Either	4	<p>Other clinicians talked of their familiarity with the patient, which can help them in their decision on whether or not to prescribe antibiotics. Clinicians' familiarity with the individual patient was important, particularly in the Balatonfured, Łodz and Cardiff networks where over half the clinicians mentioned it. Familiarity had a bearing on decision making in relation to knowledge of</p>

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					<p>recurrent infections (“I’m probably more likely to prescribe earlier in patients who I know well and who I know have had (recurrent) history” Cardiff 98).</p> <p>[Authors, general practice, Brookes-Howell 2012a]</p> <p>In one practice, where patients would normally see the same GP each time they consulted, the HCP said that knowing the child helped them identify serious illness: “The advantage of being a GP is that you know a lot of the children and what they’re like. For example, yesterday I saw a child that’s about 1, who I have been seeing quite frequently ... when the child walked in, I knew that the child wasn’t very well. She’s normally a really active child, she doesn’t let you examine</p>



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					<p>her, and she was just sitting there on her mum’s lap, not doing anything, withdrawn, and just obviously, you know, not herself at all. And so that’s one of the things that you, you know, you would look out for.”</p> <p>[GP, general practice, Horwood 2016]</p> <p>Patient–practitioner rapport in OOH was reported to be a particular challenge because prescribers have no prior relationship with their patients. Responses varied depending on the direction of influence, as some reported this would change their prescribing behaviour and others argued that their prescribing would not change regardless of prior knowledge of the patient. “No, it doesn’t matter</p>

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					<p>who they are, whether I've built a rapport with them, whether I know them or not, it makes no difference whatsoever." (Nurse, OOH). "I think when you don't know them, it's not just about knowing about their medical history but also you don't know them as a person, I think it can be quite difficult to build up a rapport in a rushed setting... it's all about how they perceive you as a doctor I think and how you get on with them as well..." [GP, OOH, Williams 2017]</p>
Social influences	Perceived importance of shared decision making	Perceived importance of shared decision making	Either	6	<p>The management decision was influenced by the extent to which clinicians believed that patients should share in the management decision and take responsibility for their own health. It influenced the extent to which clinicians felt that</p>

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					<p>they could and should control the prescribing decision and take on board patients' expectations and preferences. For example, in extract 12, the clinician explains that he recognises the patients' contribution and feels that he does not have ultimate control over a shared management decision and whether or not the patient receives antibiotics.</p> <p>[GP, general practice, Brookes-Howell 2012b]</p>
Social influences	Perceptions of own prescribing	Perceptions of own prescribing (compared to others) and feeling comfortable with own prescribing	Either	4	<p>None of the general practitioners interviewed described feeling very uncomfortable when prescribing antibiotics for sore throat. On the contrary, most felt they had reduced their prescribing in response to external pressures to a level they were comfortable with. "I</p>

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					<p>feel very comfortable with what I am doing. I don't feel bad if I prescribe antibiotics for sore throat—even the advocates of not prescribing wouldn't say don't not prescribe 100% of the time. I don't feel uncomfortable because I'm prescribing; I feel uncomfortable sometimes for not prescribing.”                      [GP, general practice, Kumar 2003]</p> <p>Many described the aim of meetings was to make peer comparisons and to learn whether their own prescribing could improve and how. “I think ranking against other practices is very powerful, you know if you were to list influences of GPs, probably below money would come peer-group comparison.”</p>

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					(British, 5) [GP, general practice, Tonkin-Crine 2011]
Skills	Additional diagnostic information from testing	Concerns with over-reliance on diagnostic testing	Barrier	1	However, many clinicians in the Tromsø-based network also expressed caution and awareness of the dangers of over-reliance on the test when deciding about prescribing antibiotics. Clinicians cautioned against 'treating a CRP result' rather than the patient and misinterpreting and responding to misleading CRP results. [Authors, general practice, Brookes-Howell 2012a]
Skills	Additional diagnostic information from testing	Misinterpreting or responding to misleading (coincidental) test results	Barrier	2	However, many clinicians in the Tromsø-based network also expressed caution and awareness of the dangers of over-reliance on the test when deciding about prescribing antibiotics. Clinicians cautioned against 'treating a CRP

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					<p>result' rather than the patient and misinterpreting and responding to misleading CRP results.                      [Authors, general practice, Brookes-Howell 2012a]</p> <p>She found most people improved while waiting for the swab result. However, she did prescribe antibiotics when group A streptococci were isolated, even if the patient had no symptoms, although she knew that the bacterium could be a coincidental finding.                      [Authors, general practice, Kumar 2003]</p>
Skills	Preserving a good relationship with patient, patient satisfaction and avoiding conflict	Ability to preserve a good relationship and patient satisfaction (in other ways than prescribing antibiotic)	Facilitator	5	Many of the family physicians described the URTI consultation as a source of potential conflict. As one shared, "Slight sort of anticipation of confrontation,

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					<p>because, you know, most of the time patients can heal themselves, and you gotta' persuade them of that. So, little bit of apprehension as to how they're going to take that" (family physician [FP]17). [GP, general practice, Mustafa 2014]</p>
Skills	Ability to elicit and manage patient's concerns and expectations	Ability to elicit and address patient's concerns and expectations	Facilitator	5	<p>"I find it better to say to the parents at some time in the consultation, 'Did you come in expecting antibiotics?' ...And I think that breaks the ice quite a lot. Because the vast majority will say, 'Well no I didn't, you know, I didn't come in for that.' And I think that sort of takes the tension out of the consultation. Because I think a lot of doctors are sort of sitting there thinking, 'I don't want to prescribe antibiotics,' and they're thinking that</p>

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					the parents want antibiotics. But actually most of them don't." [GP, general practice, Horwood 2016]
Skills	Ability to elicit and manage patient's concerns and expectations	Lack of ability to manage patient expectations for antibiotic effectively	Barrier	1	"Once patients have worked out what they want, to actually explain them out of it can be a long process. I know people who will come in here and say antibiotic x doesn't work for me can I have y instead—I mean, I find it hard to explain... how to communicate the science doesn't support what they believe. So for sore throat I have to think is it the bacteria, the virus, or patient you are giving the antibiotic for. So if I think I'm treating the whole patient and not just the virus then I feel better about giving the antibiotic here— because there is a



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					holistic duty here” [GP, general practice, Kumar 2003]
Skills	Ability to reassure and safety-net	Ability to reassure a patient and provide safety-netting advice	Facilitator	7	In line with the perception that many RTI patients present concerns about the cause of their symptoms, participants described a number of strategies for managing these. For example, using the findings of the clinical examination to explain to the patient that their illness does not require antibiotics, reassuring patients that they are doing the correct things in terms of managing their symptoms, describing signs to be aware of which might indicate a more serious illness, and encouraging re-consulting if symptoms change: “I will listen to their chest, and you know just so they think they have had a thorough examination really

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					<p>because half the time it's just they feel that people aren't listening to them, or they are not taking them seriously... I am quite happy that they are well most of the time, so I just do it to sort of make them feel reassured, because a lot of it is just anxiety of people." (NP10)</p> <p>Participants indicated that in telling patients they did not have a bacterial infection and communicating the no-prescribing decision, it was important not to imply that a viral infection was less severe thereby dismissing the patient's illness. Thus, illness validation and empathy were viewed as particularly important when antibiotics were not prescribed: "I like to let them know how bad a virus actually is...let them know that you know I believe</p>

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					<p>that you are unwell I'm not poohpahing your unwellness it's just unfortunately my piece of paper isn't going to give you a cure, it's viral... I think often they think they've been fobbed off by it's just a virus." (Focus Group 3) [Nurse, general practice, Rowbotham 2012]</p> <p>Providing a safety net in OOH The third and final phase of the communication process was patient safety-netting. This included a thorough explanation of possible side effects of antibiotics (if prescribed), an explanation of red flag symptoms of further complications and signposting to another health service. "...I probably will never see that patient again, it is really about thoroughly</p>

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					<p>going through with them what you expect to happen with this illness, depending on whether you've prescribed or not. Just making sure that they understand anything that they need to be looking out for, which they need to be concerned about and what they need to do about that. Where they need to go... it's about being really specific in that information." [Nurse, OOH, Williams 2017]</p>
Skills	Ability to reassure and safety-net	Ability to prepare a patient for, and justify, a decision whether to prescribe antibiotic or not	Facilitator	6	<p>During the physical examination, clinicians often emphasized that the 'chest' or 'lungs' were 'clear' or free of infection, presenting this as definite observable evidence that supported their conclusion that the illness was viral and no antibiotics were needed (Supplemental Table 1: 1.2, 1.3). In contrast, when</p>

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					<p>antibiotics were prescribed, the prescription was justified by reference to problematic or potentially worsening symptoms (Supplemental Table 1: 1.5, 1.6, 1.7). This reinforced the parent's perception that antibiotics were used for more severe illness and that the physical examination differentiated between illnesses that did and didn't need antibiotics (Supplemental Table 1: 1.4, 1.5). [Authors, general practice, Cabral 2016]</p> <p>Negotiating treatment: Participants described the second stage of the communication process as a negotiation about treatment. Participants reported normalizing patient symptoms in order to aid patient understanding of illness</p>

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					<p>severity and duration in RTIs, and how important these subtle communication practices were perceived to be. “[I tell patients]...’this is normal; this is normal. That’s really good. Your temperature’s normal,’...this is what they’ve got and what the normal duration of that illness is...there’s no need for antibiotics...I try and present that as a positive so, ‘Oh, the good news is you don’t need any antibiotics. You can manage this yourself at home.’ It’s about how you give that message really.” [GP, OOH, Williams 2017]</p>
Skills	Ability and motivation to educate patients in consultations	Ability to educate patients in consultations (by explaining about infections, symptoms and antibiotic)	Facilitator	7	The family physicians also used the examination to educate patients for future illness episodes. As one explained, “If I do find a child with follicular tonsillitis, I always say to

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					<p>the parents, ‘Come and look with me, this is what I’m looking for and if, when you see this in future, erm, you then know you need to bring them to me’” (FP16).                      [GP, general practice, Mustafa 2014]</p>
Environmental context and resources	Evidence and guidelines	Availability of (clear) evidence and guidelines	Facilitator	4	<p>Participants referred repeatedly to guidelines and protocols they were required to follow when making prescribing decisions. [Authors, general practice, Rowbotham 2012]                      All GPs stated that providing a clear evidence base strengthened their trust in recommendations. [Authors, general practice, Tonkin-Crine 2011]</p>
Environmental context and resources	Access to patient’s medical records or history	Lack of access to patient’s medical records or history (leading to being	Barrier	1	<p>Access to patient GP records was variable; some reported no access whereas some prescribers reported having access to electronic patient</p>

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		overcautious and prescribing 'just in case')			<p>records when general practices had agreed to allow such access. Those without access reported that it led to uncertainty and additional pressure to make the correct prescribing decisions.</p> <p>“But, out of hours you’re just seeing them on that spot, you’re just seeing them once and somebody else is going to see them afterwards. Therefore you need to make the correct decision every time just once knowing that you might not see that patient, or the next thing you might see the GMC or the complaint. Therefore it just causes you more hassle for yourself eventually I guess. So that should be – yes, that should be the huge difference I guess.”</p> <p>[GP, OOH, Williams 2017]</p>



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Environmental context and resources	Additional diagnostic information from testing	Access to point of care diagnostic information as an additional source of information helping reduce uncertainty and guide prescribing decision	Facilitator	2	Only one doctor, interviewed as part of the theoretical sample, said she took throat swabs when patients appeared toxic. Her reasons for doing so were to manage her own and the patients' uncertainty, to delay or prevent antibiotic prescription, and to support her explanation that such symptoms could be caused by a virus. [Authors, general practice, Kumar 2003]
Environmental context and resources	Additional diagnostic information from testing	Lack of access to point of care diagnostic tests	Barrier	1	However, many GPs felt their ability to select an antibiotic on the basis of the infecting agent was hampered by not having sensitivities available at the point of prescription, and consequently were required to prescribe empirically. Although urine samples

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					<p>were frequently sent to the laboratory, sampling was far less frequent for other infections. Even when samples were sent, GPs felt under pressure to treat the patient immediately both because of patient expectation and their concern that delay would cause deterioration.</p> <p>[Authors, general practice, Wood 2007]</p>
Environmental context and resources	Ability to re-assess or follow-up the patient	Ability to re-assess or follow-up the patient if needed	Facilitator	1	<p>NMPs also offered patients the opportunity to re-consult, and believed that this allayed patients' concerns. One NMP made follow-up calls to some patients highlighting that eased patients' concerns about their condition and the lack of antibiotics. 'I will say, well look, I will give you a ring on Friday to see how you are doing</p>

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					and then we know you'll be covered for the weekend and that helps a lot, particularly with the older ones.' [Nurse, general practice, Courtenay 2017]
Environmental context and resources	Ability to re-assess or follow-up the patient	Lack of ability to re-assess or follow-up the patient	Barrier	1	Participants reported a perception that patients are generally sicker when they attend OOH services than in-hours services. With an inability to follow up patients, this appeared to translate into a perceived higher clinical risk and therefore an increased likelihood of antibiotics being prescribed. '...out-of-hours you are taking more risks in a way because there isn't quite the same sort of follow-up. You're generally tending to deal with sicker patients than you are on a day-to-day practice in general practice... therefore I think it probably makes

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					you a little bit more cautious in out-of-hours.” [GP, OOH, Williams 2017]
Environmental context and resources	Timing of consultation and access to GP or medical services	Limited access to GP or medical services (lowering threshold for antibiotic prescribing)	Barrier	6	<p>A few HCPs mentioned the pressure of time or timing of consultations in relation to access to primary health care as factors that may make them more likely to prescribe antibiotics or provide a delayed prescription to reduce parental anxiety, especially on the eve of a weekend or holiday [Authors, general practice, Horwood 2016]</p> <p>Participants reported higher prescribing rates at the weekend, although decisions to prescribe were reportedly used as an additional safety net, depending on the medical cover available the following day. “...it depends what</p>

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					<p>sort of medical cover you've got the following day. For example, I might see a [patient] on a Saturday morning, knowing that there isn't any Sunday medical cover, and so it's just a bit of uncertainty about which way their infection is going to go and their degree of vulnerability, and I would want them to start treatment perhaps a little earlier than I might do if I could follow them up the next day." [GP, OOH, Williams 2017]</p>
Environmental context and resources	Time pressure and workload	(Perception of) Time pressure and workload (prescribing as a quicker way to close a consultation than educating or explaining when under time pressure)	Barrier	6	<p>"So now I prescribe when I feel under pressure or if I'm running late as duty doctor when it's too much to go through the detailed process of saying sore throats are caused by viruses and they will get better anyhow, etcetera. When I'm in surgery I do that more often but not</p>

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					<p>as duty doctor—it’s too busy.”                      [GP, general practice, Kumar 2003]                      NPs reported having more time to spend with patients, whereas GPs highlighted how consultation time and the pressure to end a consultation influenced the likelihood of providing an antibiotic prescription during a busy OOH shift. Appointment time was reported to be variable between organizations as well as between GPs and NPs. When there was no appointment system, participants reported that they were still aware of the time they spent with each patient, especially during busy shifts when there was a long wait to be seen, and as such time remained a factor that influenced</p>

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					<p>their decision to prescribe an antibiotic.</p> <p>“...sometimes you’re rushed, sometimes it can be easier to give the antibiotics rather than having a discussion with them each time.”</p> <p>[GP, OOH, Williams 2017]</p>
Environmental context and resources	Consultation length	(Perception of) Sufficient consultation length to examine a patient and explain non-antibiotic prescription and to educate and reassure patients	Facilitator	2	<p>However, many NPs did not consider limited time a barrier to effectively managing the consultation: I mean you can usually do, you can usually manage to examine somebody and explain within kind of 10 or 15 minutes... it doesn’t take that long.</p> <p>[Nurse, general practice, Rowbotham 2012]</p> <p>NPs reported having more time to spend with patients (...). “We’re really, really fortunate here... our appointment times, if you’re booked</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>into the nurse clinic, they're half-hour appointments, so we can really spend time providing the education and explaining why we're not giving antibiotics." [Nurse, OOH, Williams 2017]</p>
Environmental context and resources	Consultation length	(Perception of) Insufficient consultation length to explain non-antibiotic decision and/or to educate and reassure patients	Barrier	2	<p>One doctor who described himself as a low prescriber highlighted his difficulties in negotiating with patients who demanded antibiotics because they believed in their effectiveness. Other general practitioners also highlighted that 5 to 10 minutes was not enough to convince such patients. [Authors, general practice, Kumar 2003]</p> <p>NPs reported having more time to spend with patients, whereas GPs highlighted how consultation time and the pressure to end a</p>



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					<p>consultation influenced the likelihood of providing an antibiotic prescription during a busy OOH shift. Appointment time was reported to be variable between organizations as well as between GPs and NPs. [Authors, OOH, Williams 2017]</p>
Environmental context and resources	Consistency of approach to antibiotic prescribing	(Perception of) inconsistent approaches to antibiotic prescribing (between practice staff or between organisations)	Barrier	3	<p>However, while some NPs indicated that they worked closely with GPs in dealing with patients with RTIs, others reported difficulties such as GPs prescribing antibiotics to patients following a no-prescribing decision from an NP. This was a source of frustration for NPs as they felt it undermined their expertise and attempts to educate patients. Overall, NPs felt that there needed to be better communication and closer working</p>

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					<p>between GPs and NPs: “I sent tonsillitis viral and they wanted antibiotics and they’d gone through everything and my last thing was, you can always see someone else if you’re not happy and that’s what they wanted and he [GP] went and he give it, some antibiotics. I were fuming... I called him and asked him, why did you give it? And he held his hands up, he said you’re right, you’re right in everything you’ve said but just wouldn’t have the guts to say no at the end of it, I said well why bother.”</p> <p>[Nurse, general practice, Rowbotham 2012]</p> <p>Working contracts in OOH were reported to be challenging owing to a constantly changing workforce, in which clinicians all worked in</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>different ways, including varying shift patterns. This was also reported to be different between GPs and NPs; NPs tended to be full-time members of staff and GPs reportedly worked on a bank or ad hoc basis. This changing workforce reportedly causes difficulty in maintaining consistency with regards to providing training and education, increasing the likelihood that antibiotics would be prescribed against local guidelines. "...if you've got a transient clinical population, clinical workforce, you can't train them up, you can't educate them, you can't support them, they just come in and...I was going to say dole out antibiotics, I'm sure they don't do that, but it's easier if you're going to tootle off to</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					another organization the next day.” [GP, OOH, Williams 2017]
Environmental context and resources	Use of patient leaflets	Access to and use of patient leaflets (helping to explain no-antibiotic prescribing decision and provide advice)	Facilitator	4	<p>Within the interviews, NMPs reported explaining ‘no antibiotic’ decisions, providing information about treatment, and directing patients to information leaflets and websites.</p> <p>[Authors, general practice, Courtenay 2017]</p> <p>Patient education leaflets were reportedly utilized as a tool to support explanations when an antibiotic was not prescribed. NPs described them as being used as a way to reinforce their message and enhance their epistemic stance with their patient. “But it’s an actual piece of paper rather than just saying to patients, ‘Look, you’ve got a virus, go and take some</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					paracetamol and lie down'. [...] The fact that it's endorsed by all the important people at the bottom just gives it a bit more welly." [Nurse, OOH, Williams 2017]
Intentions	Evidence and guidelines	Adopting guidelines or evidence as a standard practice (intention to follow them)	Facilitator	2	"I think, as a GP over the last 4 or 5 years, I've become more conscious of changes in antibiotic prescribing in general practice as a whole. And I think that the conditions we used to prescribe more antibiotics for, such as sore throat, in the past we do less so now because of research which has become well publicised. I am more reluctant to prescribe, so I suppose I would say that I try to reserve antibiotics for when I feel I'm likely to be dealing with bacterial sore throat." [GP, general practice, Kumar 2003]

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Intentions	Preserving a good relationship with patient, patient satisfaction and avoiding conflict	Preserving a good relationship, patient satisfaction and avoiding conflict by prescribing antibiotic (even if unnecessary)	Barrier	3	Clinicians' tolerance of conflict varied. Some felt that they were more likely to prescribe antibiotics in order to avoid conflict with a patient wanting antibiotics (extract 13). This might not necessarily be a fixed characteristic in the clinician but may be dependent on the encounter with an individual patient. [Authors, general practice, Brookes-Howell 2012b]
Intentions	Ability and motivation to educate patients in consultations	Motivation to educate patients in consultations	Facilitator	7	The emotional investment clinicians put into discussing the management decision also varied. The effort and enthusiasm clinicians devoted to dissuading patients who unnecessarily wanted antibiotics appeared to have an impact on clinicians' decision-making. For some clinicians this

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>differed day-to-day depending on the individual patient or their own mood at that time. However, other clinicians felt that they had a general tendency towards either putting in the extra emotional energy needed to dissuade the patient, or not. This did not necessarily relate to the time clinicians had been in practice. Some felt that they had more energy to engage with patients about this issue when recently qualified (extract 14), while some experienced clinicians' felt it necessary to put in extra effort to explain to the patient the evidence for limiting antibiotic use (extract 15).</p> <p>[Authors, general practice, Brookes-Howell 2012b]</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Intentions	Views on and use of delayed prescriptions	Belief that delayed prescribing can be helpful (resulting in intention to use it)	Facilitator	5	<p>On the whole, delayed prescribing was regarded positively, and general practitioners thought it could be used to manage diagnostic uncertainty, to reassure the patient, to prevent re-attendance, to reduce the likelihood of a patient taking the antibiotic, and to shorten consultation time. [Authors, general practice, Kumar 2003]</p> <p>Delayed prescribing was reported by GPs and NPs as a useful aid for dealing with patient demand for antibiotics as well as encouraging shared decision making, shared management and providing a tool for safeguarding against further complications. [Authors, OOH, Williams 2017]</p>



Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Intentions	Views on and use of delayed prescriptions	Belief that delayed prescribing is not helpful or effective (resulting in no intention to use it)	Barrier	2	One general practitioner questioned the effect of delayed prescribing on patients, suggesting its effects were no different from issuing a prescription for antibiotics: GP: "I don't use delayed prescribing I feel that makes it just, well, you're just hedging your bets. You are either sure of what you're doing or you're not sure of what you're doing. So, if you see a sore throat you're either saying you're sure it's viral and self-limiting and going to get better or you're not." [GP, general practice, Kumar 2003]
Emotion	Experience of and concern about adverse events resulting from prescribing decisions	Negative experience of prescribing antibiotic; concern about side effects and AMR resulting from prescribing antibiotics	Facilitator	2	"I think down to my own experience and where I feel I am in my practice compared to my peers, it's quite interesting how I use antibiotics quite a lot less and I wonder if that's because I have actually seen

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>people die in hospital, in my career, from bacterial, you know antibiotic resistance and C.Diff diarrhoea and things like that.” [GP, general practice, Ashdown 2016]</p>
Emotion	Experience of and concern about adverse events resulting from prescribing decisions	Negative experience (own or anecdotal) of not prescribing antibiotic; concern about potential negative consequences of not prescribing	Barrier	5	<p>“It’s one of those grey areas where one dreads making a mistake, where you’ve got conflicting forces, sometimes parental expectation which is, you know in a sense is almost a side issue, but the awareness that inappropriate antibiotics is a major problem but missing one child with a pneumonia who then gets ill or dies is ****ing disaster... [...] The easiest thing is to dish them out and not worry about the global issue.” [GP, general practice, Ashdown 2016]</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Emotion	Concern with legal issues	Concern with legal issues or patient complaints (resulting from risks of not prescribing antibiotic)	Barrier	5	<p>They anticipated being held to account and feared legal action. [Authors, general practice, Cabral 2015]</p> <p>“Therefore you need to make the correct decision every time just once knowing that you might not see that patient, or the next thing you might see the GMC or the complaint.” [GP, OOH, Williams 2017]</p>
Social or professional role and identity	Perceptions of professional role and ethos	Ethos of embracing change	Facilitator	1	<p>Clinicians’ professional ethos: Many clinicians felt that receptiveness, that is, the extent to which they kept an open mind and embraced new developments, impacted on their management and prescribing behaviour. [Authors, general practice, Brookes-Howell 2012b]</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Social or professional role and identity	Perceptions of professional role and ethos	Not embracing change, preference for well-established practices and habits	Barrier	1	There is an implication that clinicians who are less willing to embrace change will continue to prescribe antibiotics as they have always done through routine and everyday experience (extract 7). This was a strong theme that emerged across networks. [Authors, general practice, Brookes-Howell 2012b]
Social or professional role and identity	Perceptions of professional role and ethos	Wanting to be a good professional (doing the right thing by following prescribing guidance)	Facilitator	1	Family physicians were aware of other personal and professional benefits in minimizing antimicrobial prescribing. One said, "I don't want to give them [antibiotics] because I want to be seen as a good GP [general practitioner]. I want to be seen that I'm doing the right thing by my peers" (FP7). [GP, general practice, Mustafa 2014]

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Social or professional role and identity	Perceptions of professional role and ethos	Perceiving self-care advice and patient education as central to the professional role	Facilitator	2	Participants [nurses] viewed education about self-management as central to their role and advised patients on various forms of symptom relief for RTIs, including drinking fluids (hot and cold), keeping warm, steam inhalation, taking paracetamol, and using cough linctuses, although some NPs expressed concerns over not always being sure which approaches were evidence-based. [Authors, general practice, Rowbotham 2012]
Social or professional role and identity	Perceptions of professional role and ethos	Perceiving a professional role to treat the patient holistically by considering factors other than clinical assessment	Barrier	1	“So for sore throat I have to think is it the bacteria, the virus, or patient you are giving the antibiotic for. So if I think I’m treating the whole patient and not just the virus then I feel better about giving the antibiotic here – because there is a

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>holistic duty here.” This general practitioner describes a context that gives rise to discomfort at different points in the consultation: the doctor realising his beliefs are contrary to the patient’s, recognition of the difficulty in communicating evidence to influence the patient’s beliefs, and the time required for explanation. Holism allows the doctor to overcome these discomforts because it offers a framework in which fulfilling a patient’s wants is recognised as a positive professional response that can have benefits for patient and doctor.</p> <p>[GP or Authors, general practice, Kumar 2003]</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Social or professional role and identity	Perceptions of professional role and ethos	Fear of missing a serious illness perceived as a threat to professional expertise	Barrier	1	<p>For clinicians, the possibility of “missing something in a child” was felt to be a potential threat to their professional expertise or standing. (...) In contrast, an unnecessary antibiotic prescription was not really perceived as a threat to professional judgement or standing, partly because it is not possible to know or provide evidence of when an antibiotic prescription is or is not necessary.</p> <p>[Authors, general practice, Cabral 2015]</p>
Social or professional role and identity	Perceptions of professional role and ethos	Lack of (feeling of) accountability for own prescribing (as specific to one’s role)	Barrier	1	<p>A common perception across interviews with NPs was reports of their feeling more accountable for their prescribing than their GP counterparts. “...I just don’t think [doctors] see that it’s not a problem right now rather than the future. So,</p>

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					<p>that one prescription doesn't really matter, do you know what I mean? There's no accountability for it and no one is going to pull them up five years down the line and say, 'You shouldn't have given that prescription', so the prescribing responsibility isn't there." [Nurse, OOH, Williams 2017]</p>
Social or professional role and identity	Perceptions of professional role and ethos	Working according to protocol and guidelines (as part of a professional role)	Either	2	<p>GPs who had worked with NPs observed that NPs were more likely to work to protocol, to which they felt there were benefits and drawbacks. NPs tended to agree with this definition and saw this in a positive light; that this protocol meant their decisions were made based on the facts before them and supported by local and national guidelines. GPs reported they would often prescribe differently</p>



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					<p>from the guidelines and base their prescribing decisions on 'gut feeling'. Both types of prescribers felt that GPs would be able to deal with more complex patients than NPs. "I think it's quite complicated and a nurse will more likely work to a protocol, which is a good thing if you're looking at objective performance but also can be a difficulty for them if the protocol doesn't meet all the variables that the patient's presenting with...I don't actually quite know whether nurses prescribe more antibiotics than doctors. I bet they prescribe less actually."                      [GP, OOH, Williams 2017]</p>
Social or professional role and identity	Perceptions of professional role and ethos	Perceived lack of professional authority (of nurse prescribers, leading	Either	2	NPs were aware they did not have the level of training and experience of GPs and were concerned about

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		to patients not trusting their decisions and needing clear justifications for prescribing decisions)			the possibility of making mistakes or faulty decisions. Linked to this was the perception that due to the newness of the NP role, they were particularly open to criticism and scrutiny of their ways of working. NPs also considered that they had to have solid justifications for prescribing decisions and that there was a lack of legal protection for NPs. However, this did mean that NPs were thorough and cautious when dealing with RTIs: “An awful lot of nurses are quite cautious prescribers. And they would check things out really before they kind of prescribe because they are scared to do wrong you know... I think legally GPs are probably more established so they have got, they have probably got more protection than the nurses have currently.”

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					<p>(NP3) In addition, some NPs felt that patients perceived them as lacking in expertise and authority compared with GPs: “Sometimes I bring the doctor in... because sometimes they would listen to them, more than me, but I used to bring the doctor in who I knew wouldn’t give antibiotics.” (NP10)                      [Nurse, general practice, Rowbotham 2012]</p> <p>NPs reported professional identity as a key influence in patient expectations. They described patient distrust that a no-prescribing decision was bound up with the profession of nursing and felt patients tended to believe that they would have been prescribed an antibiotic had they seen a doctor instead. “...I find it tricky because</p>

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					<p>sometimes I feel the patients think I'm not giving them antibiotics because I'm a nurse and that if they saw a doctor they would get them instead [...] Sometimes, unfortunately, if they have not been happy with not getting them, and they've re-booked to see a doctor, sometimes they are then given them. So the next time I see them, it just makes it that much harder all over again to try and convince them [...]"</p> <p>[Nurse, OOH, Williams 2017]</p>
Social or professional role and identity	Perceived importance of shared decision making	Perceived importance of shared decision making (as part of a professional role)	Either	6	<p>In contrast, a few family physicians reasoned it was entirely unnecessary to elicit expectations for antibiotics given the physician's professional role: "I don't think I need to ask an open question or a closed question saying 'Do you</p>

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					<p>think that the child needs antibiotics?' That is what we are supposed to decide anyway."                      [GP, general practice, Mustafa 2014]</p>
Knowledge	Evidence and guidelines	Awareness or knowledge of evidence and guidelines	Facilitator	4	<p>Only a handful of GPs (particularly those more recently qualified) mentioned using guidelines or other tools to help with decision-making, although on specific questioning about this, many GPs were aware of the Centor criteria for sore throats<sup>5</sup> and NICE guidelines (many mentioned the traffic light system for assessment of a feverish child,<sup>12</sup> but none alluded to the guidance on comorbidities in relation to antibiotic prescribing for RTI).<sup>5</sup>                      [Authors, general practice, Ashdown 2016]</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Knowledge	Evidence and guidelines	Lack of awareness or knowledge of evidence or guidelines	Barrier	1	<p>“I would feel out of my comfort zone as to know when that was. So I would be, I think because I haven’t come across an ASD for years I think I would still probably just ring the paediatricians and put it past them to check that, because I’m not quite clear about what the guidelines are with ASDs so I’d feel more comfortable just ringing them and asking them.”</p> <p>[GP, general practice, Ashdown 2016]</p>
Knowledge	Evidence and guidelines	Misunderstanding recommendations	Barrier	2	<p>Despite this, some GPs seemed to focus on changing antibiotic type, from a second-line antibiotic to a first-choice drug, rather than reducing prescribing overall, suggesting that they may not have understood the message of reduced prescribing. This included</p>

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					<p>GPs who had received a lot of information on recommendations: “I mean that’s the bottom line really to get the prescribing away from sort of second line prescribing.” [GP, general practice, Tonkin-Crine 2011]</p>
Knowledge	GP training	GP training about appropriate AP	Facilitator	2	<p>Many described the aim of meetings was to make peer comparisons and to learn whether their own prescribing could improve and how. Some felt this was useful for GPs whose initial training may have differed more widely from current guidelines. [Authors, general practice, Tonkin-Crine 2011]</p>
Knowledge	Awareness or knowledge of and attitude to AMR and	Awareness or knowledge of and concern about AMR	Facilitator	1	<p>Awareness and concern about antimicrobial resistance clearly did influence GPs’ choice of antibiotic. GP34: ‘I am aware of resistance,</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
	to prudent antibiotic prescribing				potential resistance problems, with obviously broader spectrum antibiotics we are going to cause a problem if we keep using them too much, because we'll run out of new antibiotics that will cover things. So I am very cautious, I do not give ciprofloxacin without thinking about the resistance element or can I use something simpler first.' (Average fluoroquinolone practice) [GP, general practice, Wood 2007]
Knowledge	Feedback on prescribing	Receiving feedback on prescribing	Facilitator	2	Audit, feedback and/or supervision were reported to be very important in OOH prescribing as this was thought to help inform future prescribing decisions and this was common across both GP and NP respondents. [Authors, OOH, Williams 2017]



Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
Beliefs about capabilities	Clinical experience and confidence	Relevant clinical experience; confidence in making prescribing decisions based on this experience	Facilitator	3	Clinicians' confidence in assessing whether antibiotics were appropriate or not appeared to be related to clinicians' own knowledge and experience (extract 10), with clinicians reporting increased confidence as they saw more patients over time with similar symptoms (extract 11). [Authors, general practice, Brookes-Howell 2012b]
Beliefs about capabilities	Clinical experience and confidence	Confidence in ability to identify serious illness based on experience and exposure to very sick patients; belief they are less likely to miss something serious	Facilitator	3	Clinicians also described how experience influenced their self-efficacy in management of RTI in children, but in their case it was experience of seeing very sick children which increased their confidence in making decisions that they felt were safe. Experiences of seeing children with RTI in hospital were particularly valued because

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>clinicians believed they had better knowledge of the signs of a potentially severe RTI and would be less likely to “miss something in a child” (though they might still prescribe just in case)                      [Authors, general practice, Cabral 2015]</p>
Beliefs about capabilities	Clinical experience and confidence	Perceived insufficient relevant experience; lack of confidence	Barrier	2	<p>“I certainly haven’t got experience really that much with children ... It affects my confidence sometimes in dealing with children with coughs and colds ... there’s always at the back of your mind, ‘Is this child sicker than I think they are?’.”                      [GP, general practice, Horwood 2016]</p>
Beliefs about capabilities	Clinical experience and confidence	Lack of or limited exposure to very sick patients	Barrier	3	<p>Conversely, experience of only self-limiting illness meant less confidence in their ability to rule out a more severe illness. (...) “I don’t</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>examine many chests belonging to poorly kids, and probably if I listened to more kids with good going pneumonia and that sort of thing, I'd be better at I think I now, I can rule them in, I can think this is abnormal and I'm not happy, but maybe I'm not so good at saying, "This is not quite right, but it's not too bad, and we probably don't need to prescribe for it."                      [GP, general practice, Cabral 2015]</p>
Memory, attention and decision processes	Prioritising immediate pressures or long-term consequences	Responding to long-term consequences of AMR over immediate pressures	Facilitator	1	<p>GPs from average fluorquinolone prescribing practices were more concerned to reserve fluoroquinolones in case of resistance at some point in the future or for those with proven resistance now. GP34: "I am aware of resistance, potential resistance problems, with obviously broader</p>

Theoretical Domains Framework domain	Type of influence (theme)	Type of facilitator or barrier	Facilitator or barrier or either	Number of studies the influence was identified in (maximum possible is 13)	Example quotes followed by details on the participant, setting, and study reference
					<p>spectrum antibiotics we are going to cause a problem if we keep using them too much, because we'll run out of new antibiotics that will cover things. So I am very cautious, I do not give ciprofloxacin without thinking about the resistance element or can I use something simpler first." (Average fluoroquinolone practice)                      [GP, general practice, Wood 2007]</p>
Memory, attention and decision processes	Prioritising immediate pressures or long-term consequences	Responding to immediate pressures over long-term consequences	Barrier	1	<p>Although some GPs from high prescribing practices acknowledged that future resistance to fluoroquinolones could be a problem, most of them justified their current liberal prescribing of fluoroquinolones on the basis of their duty to do the best for 'the patient in front of them'...</p>

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					[Authors, general practice, Wood 2007]
Reinforcement	Use of financial incentives	Use of financial incentives to change antibiotic prescribing	Facilitator	2	GPs from Spain and the UK supported financial incentives, which they felt gave clinicians more motivation to change: "The new contract says what financial incentives does, they didn't think general practice would change, they thought no one would achieve the targets and when there was money on the table, the whole organisation, across the country, changed dramatically, almost overnight." (British, 4). [GP, general practice, Tonkin-Crine 2011]

**Table D3. Influences on prescribing within each TDF domain**

<b>TDF domains (types of facilitators and barriers)</b>	<b>Influences (overarching themes) included:</b>
<p>1. Beliefs about consequences  (Ten facilitators, 19 barriers, 4 either)</p>	<ul style="list-style-type: none"> <li>• evidence and education</li> <li>• clinical experience</li> <li>• clinical assessment</li> <li>• knowledge and perceptions of patient</li> <li>• perceptions of patient expectations and satisfaction</li> <li>• time and workload (for example, preventing re-consultations)</li> <li>• awareness and perceptions of responsibility for AMR</li> <li>• costs associated with prescribing</li> <li>• legal issues</li> <li>• attitudes to and use of AMS strategies</li> </ul>
<p>2. Social influences  (Seven facilitators, 3 barriers, 3 either)</p>	<ul style="list-style-type: none"> <li>• knowledge and perceptions of patient</li> <li>• perceptions of patient expectations and satisfaction</li> <li>• communication skills and strategies</li> <li>• monitoring, auditing, feedback and accountability</li> <li>• perceptions of own and others' prescribing</li> </ul>
<p>3. Skills (Eight facilitators, 3 barriers)</p>	<ul style="list-style-type: none"> <li>• communication skills and strategies</li> <li>• perceptions of patient expectations and satisfaction</li> </ul>
<p>4. Environmental context and resources  (Five facilitators, 7 barriers)</p>	<ul style="list-style-type: none"> <li>• time and workload</li> <li>• perceptions of own and others' prescribing (for example, inconsistent approaches)</li> <li>• attitudes to and use of AMS strategies (for example, access to leaflets)</li> </ul>
<p>5. Intentions [a TDF domain 'intentions' was double-coded with TDF domains 'skills' and 'beliefs about consequences']  (Three facilitators, 2 barriers)</p>	<ul style="list-style-type: none"> <li>• evidence and education (for example, intention to follow guidelines)</li> <li>• perceptions of patient expectations and satisfaction (for example, motivation to preserve a good relationship and P satisfaction)</li> <li>• communication skills and strategies (for example, motivation and ability to educate patients in consultations)</li> <li>• attitudes to and use of AMS strategies (for example, positive or negative attitudes, motivation (or lack of motivation) to use strategies)</li> </ul>

<b>TDF domains (types of facilitators and barriers)</b>	<b>Influences (overarching themes) included:</b>
<p>6. Emotions [TDF domain 'emotions' was double-coded with TDF domain 'beliefs about consequences']</p> <p>(One facilitator, 2 barriers)</p>	<ul style="list-style-type: none"> <li>• clinical experience (for example, concern related to negative experience of prescribing or not prescribing antibiotics)</li> <li>• legal issues (for example, concern with legal consequences or patient complaints when not prescribing antibiotics)</li> </ul>
<p>7. Social or professional role and identity</p> <p>(Three facilitators, 4 barriers, 3 either)</p>	<ul style="list-style-type: none"> <li>• perception of professional role and ethos</li> <li>• communication skills and strategies (for example, perceived role of shared decision making)</li> <li>• monitoring, auditing, feedback and accountability (for example, lack of feeling of accountability)</li> </ul> <p>[Some influences included in the theme 'Monitoring, auditing, feedback and accountability' were also coded (double-coded) with TDF domain 'social influences']</p>
<p>8. Knowledge</p> <p>(Four facilitators, 2 barriers)</p>	<ul style="list-style-type: none"> <li>• evidence and education</li> <li>• awareness and perceptions of responsibility for AMR (awareness of AMR)</li> <li>• monitoring, auditing, feedback and accountability (feedback on AP)</li> </ul> <p>[Some influences included in the theme 'Monitoring, auditing, feedback and accountability' were also coded (double-coded) with TDF domain 'social influences'.]</p>
<p>9. Beliefs about capabilities</p> <p>(Two facilitators, 2 barriers)</p>	<ul style="list-style-type: none"> <li>• clinical experience</li> </ul>
<p>10. Memory, attention, decision processes</p> <p>(One facilitator, 1 barrier)</p>	<ul style="list-style-type: none"> <li>• awareness and perceptions of responsibility for AMR (responding to immediate pressures over long-term consequences or vice versa)</li> </ul> <p>[Some influences included in the theme 'Awareness and perceptions of responsibility for AMR' were also coded (double-coded) with TDF domain 'beliefs about consequences'.]</p>
<p>11. Reinforcement</p> <p>(One facilitator)</p>	<ul style="list-style-type: none"> <li>• attitudes to and use of AMS strategies (use of financial incentives)</li> </ul>

# About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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