Towards a better understanding of patients’ perspectives of antibiotic resistance and MRSA: a qualitative study

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Background. Patients’ expectations for antibiotics are known to influence prescribing, but little is known about patients’ understanding of, and attitudes to, antibiotic resistance and whether these could modify treatment expectations.

Objective. To explore primary care patients’ perspectives on antibiotic resistance and methicillin-resistant \textit{Staphylococcus aureus} (MRSA) and understand how these could modify expectations for antibiotics.

Methods. A qualitative investigation using focus groups and semi-structured interviews with patients purposely sampled from low, intermediate and high antibiotic consumption groups from socio-economically contrasting general practices.

Results. There was uncertainty concerning the nature and implications of antibiotic resistance for both individuals and the wider community. While some patients viewed antibiotic resistance as a problem for society, most did not see it as something that would affect them personally. Many thought that science would provide the solution through the development of new drugs. Responsibility for antibiotic resistance was mostly attributed to ‘other’ patients and GPs who had respectively overused and overprescribed antibiotics in the past. As MRSA was mainly seen as a hospital-based problem, blame was largely directed at hospital management and, to a lesser degree, doctors, nurses and cleaners. Concerns about antibiotic resistance were not regarded as a reason to modify individual use of antibiotics.

Conclusions. Many primary care patients are unaware of what antibiotic resistance is and how it arises. The causes of, and responsibility for, antibiotic resistance are usually attributed to external rather than personal factors and patients perceive that its solutions are outside of their control.

Keywords. Antibacterial agents, drug resistance, patients’ views, prescribing, qualitative research.

Introduction

Resistance to antibiotics is a major threat to public health.\textsuperscript{1} In the UK, GPs are responsible for 80\% of all antibiotics prescribed. They are mostly used for respiratory tract infections\textsuperscript{2} despite evidence of marginal effectiveness for the most common respiratory presentations in primary care.\textsuperscript{3–5} The decision to prescribe is made in partnership with patients and is determined by clinical as well as non-clinical factors.\textsuperscript{6}

Previous research has examined patients’ expectations regarding antibiotics and the impact on doctors’ prescribing decisions. This indicates that GPs’ perceptions that patients expect antibiotics can lead them at times to acquiesce to inappropriate treatment.\textsuperscript{7–10} Qualitative research has highlighted the complexity of the GP–patient interaction and how patients may resist the doctor’s recommendations not to prescribe.\textsuperscript{11,12} The challenges that these interactions regarding antibiotic prescribing present for shared
decision making have begun to be addressed.12,13
Some research has examined how patients' attitudes
to antibiotic prescribing can be changed, for example
through use of the Internet.14 Public education cam-
paigns such as 'Not all bugs need drugs'15 have sought
to reduce patient expectations for antibiotics. Some
have criticized such campaigns for the overly broad
messages they convey, which fail to account for public
knowledge and attitudes regarding antibiotic resist-
ance.16

Methicillin-resistant Staphylococcus aureus (MRSA)
is probably the best-known example of a resistant bac-
terium and has been the focus of intense scientific and
political interest around the world.17 Although there
are high levels of awareness and concern about MRSA
among hospital patients and visitors,18,19 there has
been little research focused on primary care patients’
perspectives and understanding of antibiotic resistance
more broadly. Such research is important as it may in-
form the future development of interventions to mod-
ify patients' expectations for antibiotics. A UK
qualitative study of hospital patients with MRSA ex-
plored perceptions of MRSA infection and its treat-
ment, but did not examine attitudes to antibiotic con-
sumption or resistance.20 A recent qualitative
study explored public attitudes to antibiotic resist-
ance,16 but did not take account of individuals' prior
antibiotic use. This paper builds on that research by
exploring primary care patients' views of antibiotic re-
sistance and MRSA among patients with differing lev-
els of antibiotic use. It also examines their views of
the relative benefits and threats of antibiotic use for
individuals and the community and the impact this
may have on their expectations for antibiotics.

Methods

Sampling
We focused in depth on a purposeful sample of pri-
mary care patients selected in two stages. First, we re-
recruited two general practices with contrasting levels of
antibiotic use and practice populations: one a relatively
low prescribing, affluent practice and the other a rela-
tively high prescribing, deprived practice. Second, we
wrote to adults identified from the practice records
using a sampling frame that distinguished men and
women, different age groups (16–49 and ≥50 years)
and different levels of antibiotic use in the previous
12 months (0 versus 1 to 3 versus ≥4 courses). A total
of 150 patients were invited to take part. Interested
patients contacted the research team who then ar-
ranged the focus groups and interviews.

Data collection and analysis
We collected and analysed data between April 2006
and March 2007, with preliminary analyses of early
data informing the issues covered during later data
collection in an iterative manner. LB conducted the
focus groups (at the practices) and in-depth interviews
(mostly at patients’ homes) using a flexible topic
guide. The topic guide covered issues relating to par-
ticipants’ knowledge, views and experiences of antibi-
otic use and prescribing, antibiotic resistance and
MRSA. Focus groups were conducted first in order to
identify the breadth of views held and tap into shared
‘cultural’ understandings. Group members were then
invited to participate in a follow-up individual inter-
view, for a more in-depth exploration of perspectives.
Similar topics were covered within both the focus
groups and interviews. However, during the interviews
there was a greater focus on the individual’s experi-
ences of antibiotic use and how these related to their
understandings of antibiotic resistance. An outline of
the topics covered in groups and interviews is pro-
vided in Table 1. Focus groups and interviews ceased
when no new themes or perspectives were emerging
with additional data collection. All focus groups
and interviews were audio recorded and transcribed
verbatim.

We used a framework approach to analyse the
data.21 During the familiarization stage, LB read trans-
scripts repeatedly and noted initial recurrent themes.
We then constructed a thematic framework based on
these emergent and a priori themes. The a priori
themes reflected previous literature and the aims of
the study, which were to explore patients’ understand-
ning of and attitudes to antibiotic resistance and
MRSA, and their views regarding individual benefit
versus societal harm that may play a part in decisions
to consult for or consume antibiotics. A subset of the
transcripts were read by AS and ADH (a social scien-
tist and an academic GP) to check the credibility and
trustworthiness of the developing analysis and incor-
porate the perspectives of researchers with different
backgrounds. Additional emergent themes and sub-
themes were incorporated into the framework. LB
then systematically coded transcripts using the modi-
fied thematic framework, aided by the software
ATLAS.ti. Following this, LB created a data matrix
that enabled mapping and interpretation of the

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<td>Views of antibiotics and their use generally</td>
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<td>Understanding of MRSA and views of causes</td>
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<td>Views of solutions and strategies for dealing with antibiotic resistance</td>
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<td>Future use of antibiotics</td>
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<td>Any other issues</td>
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themes, examining them for commonalities, differences and patterns across all participants/groups. LB led this stage but the interpretations were discussed and agreed with the other authors. Table 2 shows the thematic framework as it developed during the process of analysis. It highlights both the emergent and a priori themes and subthemes included in the framework.

Results

Five focus groups comprising 23 patients and 20 follow-up interviews were conducted. Table 3 shows that the participants were predominantly female with a broad range of income, qualifications and previous antibiotic use. Participants reported that they had used antibiotics for cellulitis, urinary tract infections, tooth abscesses, infected wounds, sinusitis, throat infections, tonsillitis and pneumonia. Several of the participants from the more than or equal to four courses category were advised to take antibiotics on a daily basis for conditions such as rosacea, bronchiectasis or following splenectomy. We refer to these individuals as long-term users of antibiotics.

We identified four key themes relating to patients’ perspectives on antibiotic resistance. Each theme is illustrated with extracts from the focus groups and interviews, identified by pseudonym, age, gender, practice and level of antibiotic use. The data presented reflect the full range of expressed views.

Theme 1. Uncertainty about antibiotic resistance and MRSA: ‘bacteria becoming resistant’ or ‘bodies becoming immune’?

We identified a great deal of uncertainty among participants concerning antibiotic resistance, with over a quarter of the sample having never heard the term. Of the remaining participants, many found it difficult to explain what antibiotic resistance is, what causes it and its implications for patients. In contrast, all participants were familiar with the term MRSA and many had strong views about the incidence of MRSA in hospitals. However, when probed many were unsure about what MRSA was and how it affects people.

There was confusion for many participants about whether antibiotic resistance refers to the body or to bacteria becoming resistant to antibiotics (Box 1). Only a minority (six participants, five of whom were

<table>
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<td>Uncertainty about antibiotic resistanceb</td>
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<td>3. Implications of AR for individual and societal riska</td>
<td>Uncertainty of prevalence of ARb</td>
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<td>Concerns about becoming immuneb</td>
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<td>Not concerned about resistanceb</td>
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<td>Fear of MRSAb</td>
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<td>Scepticism about MRSA threatb</td>
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<td>4. Possible solutions: tackling the problem of resistancea</td>
<td>Lack of individual controlb</td>
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<td>Improving hospital hygieneb</td>
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<td>Reducing GP antibiotic prescribingb</td>
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<td>Faith in scienceb</td>
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NHS, National Health Service; AR, antibiotic resistance
aThemes in the initial framework reflecting a priori themes derived from previous literature and topic guide.
bEmergent themes added to the final framework through the analysis of the data.
Theme 2. Responsibility and blame for antibiotic resistance and MRSA: ‘irresponsible others’ and ‘responsible selves’

Ideas about responsibility and blame for antibiotic resistance were common in patients’ accounts, although their perspectives on the appropriate targets of blame differed. There were also notable differences in terms of where participants attributed blame for MRSA and antibiotic resistance, respectively.

With regard to antibiotic resistance in general, the majority blamed either ‘other’ ‘irresponsible’ patients for misusing or overusing antibiotics, or overprescribing by GPs. The irresponsible patients were characterized as needlessly using antibiotics, failing to complete the course, disposing of unwanted antibiotics inappropriately or giving unused antibiotics to others. When blaming GPs, the majority attributed the problem to past prescribing practices (where antibiotics were ‘handed out like sweets’) and perceived a change towards more conservative prescribing.

A smaller number of participants attributed blame to sources outside of medicine such as the farming industry and veterinary practice, for ‘vast overuse of antibiotics’. In contrast, participants were keen to present themselves as responsible users of antibiotics. For example, the majority claimed they would never request antibiotics from their doctor, would not expect antibiotics ‘handed out like sweets’) and perceived a change towards more conservative prescribing.

However, not all participants were willing to apportion blame. Some viewed antibiotic resistance as a process that occurs naturally and is therefore beyond human control. Three participants spoke about bacteria as naturally mutating and developing resistance to the drugs used to control them. Bacteria were anthropomorphized, being described as ‘clever’ and ‘always one step ahead’. As one participant said: ‘it’s nature’s way of beating us’ (66-year-old woman, Practice A, more than or equal to four courses).

In contrast, as MRSA was mainly perceived to be a hospital-based problem, blame was largely directed at hospital management and, to a lesser degree, doctors, nurses and cleaners. Some individuals blamed nurses for specific behaviours that could spread infections and bacteria, for example, wearing their uniforms outside of the hospital or not ensuring that visitors adhere to hand-washing procedures. The government was also identified as indirectly to blame because of organizational changes within the National Health Service, such as the introduction of contract

<table>
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<th>Box 1 Definitions of antibiotic resistance and MRSA</th>
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<tr>
<td><strong>The body as resistant</strong></td>
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<td>‘I suppose it’s a point where your body is just sort of saying well look I’ve had enough, you know I’ve had all these different things and it’s just saying you know, it’s just becoming immune and not you know accepting them, that’s the way I understand it’ (53-year-old male, Practice A, more than or equal to four courses).</td>
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<tr>
<td><strong>Bacteria as resistant</strong></td>
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<td>‘The bacteria mutate and develop resistance to the, the antibiotic, so that the antibiotics don’t work as well, the penicillin and methicillin or whatever that we’re using doesn’t work to, to kill the infections, so the infections carry on’ (38-year-old male, Practice B, one to three courses).</td>
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<td><strong>MRSA: the hospital superbug</strong></td>
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<td>‘It’s [MRSA] just a superbug really in hospitals’ (35-year-old male, Practice B, 0 courses).</td>
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from the more affluent practice) described antibiotic resistance as bacteria developing resistance to a particular antibiotic or group of antibiotics over time. The more common understanding was that of bodily ‘immunity’, namely the body becoming immune or resistant to antibiotics through antibiotic use. Many believed that being personally resistant to antibiotics might lead one to need a different type of antibiotic or a stronger dose in the future. Furthermore, participants commonly perceived a relationship between their level of antibiotic use and their personal risk of developing immunity. Consequently, long-term users of antibiotics within the sample expressed more concern about developing immunity to antibiotics than those who used them less frequently.

MRSA was primarily seen as a hospital-based problem, with very few participants recognizing that it could also affect people in the community. A common understanding of MRSA was an infection that occurs in open wounds following surgery. Not all participants associated MRSA with antibiotic resistance. Participants’ main sources of information on antibiotic resistance and MRSA were newspapers and television. Some had gained knowledge through personal experience of MRSA (three participants) or knowing somebody who had suffered from resistant infections while in hospital.

None of the participants had heard about antibiotic resistance through public information campaigns and only one participant had been informed about antibiotic resistance by a health professional (a dentist).
cleaners, resulting in inadequate cleaning. Within-participants accounts of the decline of hospital cleanliness were ideas about the erosion of authority and discipline within hospitals, which was seen to exacerbate such problems. There was much nostalgia, particularly among older participants, for a past when hospitals were portrayed as more hygienic and order was maintained by the authoritarian matron figure.

Sylvia: Well, the staff in the hospitals, they’re not as hygienic as they should be. When my husband was in a while back, this is in the heart ward, the person coming round with the tablets was coughing into her hand and then straight away putting

... 

Steve: Well yeah

Sylvia: ... out the drugs for people

Barbara: ... for cleanliness

Vera: These nurses aren’t very clean are they?

Sylvia: No

Barbara: I mean years ago they were impeccable weren’t they?

Steve: Well that’s because of the matron wasn’t it? They used to check.

(Focus Group 1, Practice A).

Theme 3. Implications of antibiotic resistance: individual and societal risk

There was uncertainty among participants concerning the implications of antibiotic resistance both for individuals and the wider community. All were unclear about the potential impact of their personal antibiotic use on their own or their community’s health. Some long-term users of antibiotics expressed concern about developing personal immunity:

‘I’m scared that I’m going to get to a stage where antibiotics aren’t … you know … I’m going to get immune to what I’m taking and need something stronger and more aggressive’ (48-year-old woman, Practice A, more than or equal to four courses).

However, the majority did not perceive a relationship between their individual consumption of antibiotics and the development of antibiotic resistance in the community. They did not consider themselves to be at risk, because they either portrayed themselves as ‘responsible’ users of antibiotics or perceived that they had not consumed sufficient quantities of antibiotics for their bodies to build up resistance and become ‘immune’. Thus, participants largely personalized the risk and reflected little on the extent to which antibiotic resistance is a community problem or one that should concern the general public.

Only a very small minority expressed concern about the consequences of resistant bacteria for society as a whole. Certain participants articulated concerns that antibiotic resistance could increasingly lead to particular infections becoming untreatable, with far reaching implications. While participants generally felt that resistance was being ‘dealt with’ sufficiently to avoid the occurrence of major problems, possible apocalyptic futures of a world where antibiotic resistance was rife were present in some accounts, with phrases like ‘hell like’, ‘epidemic’, ‘could wipe out mankind’ and ‘genocide’.

In contrast, MRSA featured much more highly in participants’ accounts as a possible threat to their personal health. The majority perceived MRSA as a very serious problem; several said it was something they worried about in general, with such feelings intensifying if they or a family member had to go into hospital. Such views were fuelled by media stories about the incidence of MRSA in hospitals. Nonetheless, others said that concerns about MRSA would not be prominent in their minds if, or when, they went into hospital and some described positive personal experiences of hospital care and hygiene that contradicted media accounts. A minority were sceptical about the threat posed by MRSA and felt that the television and news media exaggerated the danger.

Theme 4. Possible solutions: tackling the problem of resistance

Participants had differing ideas concerning possible solutions to antibiotic resistance and MRSA. Most believed that individual patients could play only a minimal role in tackling the problem of resistance as it was largely outside of their control. They felt they did not have the knowledge to personally contribute to the solution: ‘I think that’s truly something that is a medical matter, that ordinary people … haven’t got the knowledge’ (66-year-old woman, Practice A, more than or equal to four courses). While suggesting that it was important that (other) patients limit their use of antibiotics, none of the participants felt that they needed to reduce their own antibiotic use.

As a result of their uncertainty about antibiotic resistance and the perception of irresponsible antibiotic use among other patients, participants commonly identified the need for further public education about resistance. A small number of participants felt that improving hospital hygiene (such as hand washing) could help prevent antibiotic resistance by limiting the spread of bacteria in the first instance. Reducing GP antibiotic prescribing was identified as another important area, though, as noted previously, many participants felt that this had largely been addressed. Participants placed strong faith in medicine and
science, emphasizing the role of scientific research in providing the solution to antibiotic resistance, although there was ambiguity about the nature of those solutions:

‘It’s just all down to science I think ... they just have to research and come up with answers don’t they. They have to come up with the answers, I don’t see any other possibility’ (69-year-old woman, Practice A, one to three courses).

Discussion

Summary of main findings
This qualitative analysis suggests that there is uncertainty among patients concerning the nature and implications of antibiotic resistance. While some patients viewed it as a problem for wider society, most did not see it as something that would affect them personally or something they could control and therefore did not perceive a reason to modify their own individual antibiotic use. The characterization of antibiotic resistance as the ‘body becoming immune’ served to reinforce the view of antibiotic resistance as an individual problem (for patients who ‘overuse’ antibiotics) rather than one that can spread between individuals and so impact on the wider community. In seeking to explain the causes of antibiotic resistance, blame was primarily attributed to other patients who used antibiotics ‘irresponsibly’, GPs who had overprescribed antibiotics in the past and in the case of MRSA, poor hospital hygiene. There was strong faith in science and medicine to provide the solution to the problem of resistance.

Comparison with the literature
To our knowledge, perceptions of antibiotic resistance have only been explored in one other qualitative study. To our knowledge, perceptions of antibiotic resistance have only been explored in one other qualitative study. Previous research has demonstrated that information about antibiotics and antibiotic resistance supplied through community-wide campaigns, videos and the Internet can increase knowledge about antibiotic resistance and reduce patient expectations for antibiotics. However, until recently, UK-based public education campaigns, such as ‘Not all bugs need drugs’, did not include information regarding antibiotic resistance, possibly explaining in part why our study patients knew so little about it. This is being addressed by the UK Department of Health, which launched a follow-up campaign in February 2008 called ‘Getting better without antibiotics’. This aims to maintain awareness about the role of antibiotics and has included some information regarding antibiotic resistance. In contrast, campaigns in the US (‘Get Wise’) and the European Union have long been including information about the dangers of antibiotic resistance.

Interpreting our findings using Attribution theory
Many of our findings, notably those concerning patients’ views of responsibility and blame for antibiotic resistance and MRSA, the implications of resistance and possible solutions, can largely be predicted by Attribution theory, a theoretical framework from Social Psychology. It is useful to draw on this theory as it aids insightful explanation of the findings and permits the development of ideas about a theoretical framework for future interventions.

In simple terms, Attribution theory is concerned with how people explain events or behaviour (that of themselves or others) by attributing causes. It suggests that when people offer explanations about why things have happened, they offer one of two types: an external or an internal attribution. An external or ‘situational’ attribution assigns causality to an ‘outside factor’ (e.g. others, chance); by contrast, an internal or ‘dispositional’ attribution assigns causality to factors ‘within the person’ (the self).

Applying this theory to our findings, when seeking to explain why antibiotic resistance has developed, patients tended to make external attributions. They did not view themselves as potentially personally responsible; instead, they blamed others, attributing the cause of resistance to outside factors such as respondents were not concerned about antibiotic resistance, suggesting an increased awareness through media publicity and public information campaigns. Our findings are also consistent with secondary care research that has reported uncertainty and confusion about MRSA among hospital patients and visitors. Crucially, however, these studies have not explored patients’ understandings of antibiotic resistance beyond hospital-acquired MRSA, their beliefs about responsibility and blame and the impact this may have on their expectations for antibiotics. These are gaps that our findings begin to address.

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overprescribing of antibiotics by GPs in the past or irresponsible use of antibiotics by others. Similarly, in terms of MRSA, participants attributed causality to outside factors, such as poor hospital cleanliness and lack of attention to hygiene (e.g. hand washing) by others visiting hospitals, rather than seeing their own behaviour regarding antibiotics as a potential contributory factor to the societal problem of MRSA.

In addition, our finding that patients did not feel they could contribute to or control the development of antibiotic resistance or its solutions mirrors the concept of controllability suggested by Attribution theorists. Controllability contrasts causes that one can control (such as one’s own actions) from causes one cannot control (such as others’ actions and ‘chance’). In our study, patients tended to perceive the causes of antibiotic resistance as outside their control and put faith in external factors (science and medicine) to produce solutions to the problem.

Finally, the tendency of patients in our study to present themselves as responsible users of antibiotics reflects ideas within Attribution theory about motivations for attributions. Kelley and Michela argue that there are motivations behind peoples’ attributions, which largely derive from a concern to present the self in a positive light. In our study, participants tended to attribute positive behaviours to themselves (e.g. appropriate use of antibiotics), potentially motivated by the desire to present themselves favourably as responsible patients. Conversely, they tended to blame others for antibiotic resistance by attributing negative behaviour to them (e.g. irresponsible use of antibiotics by other patients or overprescribing of antibiotics by GPs), arguably motivated by self-protection.

Implications for clinical practice and future intervention development

If antibiotic resistance is to be included among the issues that impact upon patient–clinician decisions about antibiotic use, then there is an urgent need for patient-based interventions, especially in the UK. Our data suggest that better information regarding what antibiotic resistance is and what it does could go some way to reduce public uncertainty. Drawing on Attribution theory to explain our findings, we suggest that a future intervention should also encourage patients first, to consider why antibiotic resistance develops (what is causing it?) and second, should include a dimension that assigns causality/responsibility to individuals (an internal attribution) rather than to others—that is, take into account the internal versus external attributions that patients may be making.

For example, such an intervention would encourage patients to think of antibiotic resistance as within their control and part of their personal responsibility. This is more likely to have an impact on patients’ behaviour than an intervention that focuses on external factors that need to change. For example, ‘You are a person who uses antibiotics responsibly and you are helping to reduce resistance’ rather than ‘Your doctor needs to be able to reduce prescribing of antibiotics’. Such an approach would also capitalize on the tendency of patients to present themselves as responsible users of antibiotics.

Future research should work with patients to develop such an intervention, for example guided by principles within the Medical Research Council’s complex intervention framework. Until such time, clinicians should probably not cite antibiotic resistance as a reason to withhold antibiotic treatment unless sufficient time is available to explore with the patient what it is, what causes it and how the patient’s behaviour may contribute to the solution.

Strengths and limitations

The study strengths are that by using maximum variation sampling techniques, we were able to map the range of views of antibiotic resistance and MRSA held by primary care patients with differing characteristics, particularly previous levels of antibiotic use. The use of focus groups enabled us to examine patients’ perspectives as generated through interaction with others, which mirrors (at least in part) how views are formed in everyday life. Combining focus groups with interviews allowed us to both explore the breadth of perspectives among patients and probe issues in depth. Both interviews and focus groups produce public accounts with patients presenting themselves as responsible users of antibiotics. A public information campaign and other future interventions would need to address this important barrier. Use of a theoretical framework (Attribution theory) helped to enhance our explanation of the findings and enabled us to consider the implications for developing theoretically informed interventions.

Limitations are that there were certain patient groups under-represented in our sample, notably younger men from lower socio-economic groups, and the views of these and the participants not responding to our study invitation may differ from those who did. However, with respect to our main findings, it seems unlikely that either young men or non-respondents would have higher levels of awareness of antibiotic resistance than our sample. The patients were drawn from two practices in one city in the south of England. However, our results mirror closely results from another country, suggesting that our findings are relevant internationally.

Conclusions

Many primary care patients are unaware of what antibiotic resistance is and how it arises. The causes of, and responsibility for, antibiotic resistance are usually attributed to external rather than personal factors and
patients perceive that its solutions are outside of their control.

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Declaration

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