SOCIOLOGY OF HEALTH & ILLNESS

Editorial: Beyond behavior? Institutions, interactions and inequalities in the response to antimicrobial resistance
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Antimicrobial resistance (AMR) has come to prominence as a priority for policy makers and a subject for media debate, following advocacy by the Chief Medical Officer (Davies 2015). The concept refers to the emergence and spread of strains of common infections that can no longer be treated by existing antibiotic classes, as bacteria change in response to exposure to antibiotics. The concept is known to many, not least due to the work of Dubos (1959) which informed early critical accounts of biomedicine and its claims. Resistance is becoming increasingly clinically important because of the lack of new classes of antibiotics and the spread of resistance to older drugs through transfers of genetic material as well as inheritance. Recent work in sociology and science and technology studies has examined different framings of this 'social problem' (Brown and Crawford 2008; Brown and Nettleton forthcoming; Morris, Helliwell and Raman 2016), however sociology has not often been seen as part of the solution. In this virtual special issue, I draw attention to relevant work within the Sociology of Health and Illness and call for further research to inform policy and practical responses.

Currently policy in the UK mainly draws on research data from clinical psychologists and theories popularized as part of behavioural economics or 'nudge'. A 'behavioural insights' report for the Department of Health (2015) drew from these two fields, and made only one explicit reference to sociology, though some other sociological work was cited (e.g. Britten and Ukoumunne 1997; Stivers 2006). The report primarily focused on a particular type of behaviour - prescribing in primary care - seeing reducing prescribing as a type of 'antibiotic stewardship'. Little reference was made to questions that might arise if we look at prescribing in secondary care, or indeed the experience and management of infection and medication beyond the clinic. These omissions are corrected in Fiona Wood's much broader discussion of 'Antimicrobial Resistance and Medical Sociology' (2016) – prepared for the ESRC – which makes numerous interesting suggestions about sociological concepts that might inform research, including theories of risk and illness beliefs and professional identity and power. However, the document mainly cites work with an explicit focus on antibiotics or invokes very general theory to suggest resources for further work.

This special issue aims to take a path between behavioural analysis as the policy 'dish of the day' and the broad conceptual menu offered by Wood, introducing work in medical sociology that is relevant to AMR even where it does not start from questions about antibiotic prescription and use. In particular I argue for more research on the meaning of and response to different infections, building on the recent argument that the concept of resistant infections is a more intuitive starting point for public health messages than explaining 'resistance' as a characteristic of bacteria (Wellcome Trust 2016). For those seeking to reduce antibiotic use and the spread of infections that prompt it, research on healthcare institutions and clinical interactions also has much to offer, especially when it looks beyond prescriber behaviour alone.

Finally, I suggest that reviving and extending previous sociological work on health inequalities may be important to provide evidence on the distribution of 'need' for antibiotics and prevent worsening inequalities through reductions in prescribing mandated by national policy.

As an issue, AMR can be posed as invoking a tension between an individual with current health problems and collective, future needs that demand that we seek to preserve the efficacy of antibiotic drugs. However current health problems arise and are treated within social settings, including the family, primary and secondary health care organisations and communities. Consequently the meanings of infections and their treatment are negotiated in a web of relationships between people and technologies. Health-seeking by professionals or lay people is also balanced against other priorities and pressures. Providing information about the risks of particular actions like over-prescribing of antibiotics is not enough – often risks are known but do not shift embedded routines and ways of thinking, especially where there is a shortage of time or money (for discussion of this in relation to professional practice see Broom et al 2014). For lay people the unequal distribution of such pressures also helps explain social patterns of harmful practices like smoking and medicine use in ways that are tackled only briefly in analysis that starts from individual behaviour (Calnan and Williams 1991, Cohn 2014). In the rest of this introduction to the special issue I set out some of the ways in which our field's social and situated understandings can help inform research and practical action to conserve the efficacy of current antibiotics and reduce the spread of infections.

Infections

Antibiotics are an important part of the image and practice of modern medicine (Calnan and Williams 1992) and are used to counter a wide range of bacterial infections through direct treatment and prevention (prophylactic use around surgery or chemotherapy when the body is compromised). Work by Brown and colleagues helps consider the meaning of such infections, drawing attention to the wider awareness of bacterial resistance. For example, one paper shows how media reporting of the threat of methicillin-resistant staphylococcus aureus (MRSA) represented bacteria as 'clever' and versatile, outwitting antibiotics through mutation (Brown and Crawford 2008). The same authors consider the experience of those who had surgical site infections. Brown et al (2014) show how patients might make sense of infections acquired after surgery (known as Health Care Acquired Infections or HCAIs) and adopt their own practices for wound management, based on a complex set of beliefs about the body, threats to its health, and medical treatment. Though neither paper is directly concerned with antibiotic use these authors demonstrate how ways of framing the problem of resistant infections imply particular solutions and responsibilities. For example, they express concern that talk of 'vulnerable groups' and hygiene failures in institutions outside healthcare, such as care homes and schools 'mitigates the responsibilities of hospitals and statutory healthcare providers and turns the risk back towards the individual as a responsible actor in an ecology of mutation' (Brown and Crawford 2008 p520), and then show that patients may indeed be ready to shoulder this responsibility by narrating wound infections as their fault (Brown et al 2014). These studies offer some support for the argument that the risks of resistant infections are being discussed outside the medical profession and may be used in stewardship messages, even when the mechanisms of AMR are not well understood (Wellcome 2016). At the same time, they remind us that calling for action from particular groups risks making them feel or appear responsible – it introduces moral and political questions as well as purely practical ones. This issue is particularly clear in hospitals, when difficulties in changing the practice of senior medical professionals have sometimes led to efforts to add antibiotic stewardship to the duties of less powerful actors. Sociological work on infection management as part of hospital

safety helps elaborate some of the issues here with an organizational or institutional perspective.

Institutions

An awareness of the difficulty of changing professional behaviour is by no means exclusive to sociology. In a study cited by the Department of Health Behavioural Insights report, Charani et al (2013) rehearse understanding that prescribing is shaped by numerous factors, including doctors' sense of their own individual responsibility for their patient and professional hierarchies. They use the concept of 'prescribing etiquette' (see Armstrong and Ogden 2006) to argue that senior doctors may value prescribing autonomy highly, leading them to pay little attention to guidelines and making it difficult for more junior staff to challenge decisions. Similar and stronger pressures are felt by other healthcare practitioners. In reporting on their project on superbugs, Crawford and Brown (2008) noted that though the modern matron was expected to play a key role in infection control, matrons themselves talked of their limited power, especially in trying to achieve greater cleanliness of the ward environment. Other work has since been published based on research in Australia that explored nurses as brokers of antibiotic prescribing (Broom, Broom, Kirby and Scambler forthcoming) and accounts of the problem from pharmacists and managers (Broom, Broom, Kirby and Scambler 2015; Broom, Gibson, Broom, Kirby, Yarwood and Post, 2016). Such research does not simply raise questions of whether a particular occupational group has 'power' to reduce prescribing or infections in a particular institution, but requires an understanding of organizational practice that can account for the negotiation of work within and between different actors and teams.

Numerous sociological pieces on broader questions of patient safety help elaborate on the social organization of clinical work and safety, including the distributed or diffuse nature of much decision making and accountability (Goodwin 2013, Aveling et al 2015) and the need to attend to the play of power and control between different actors (Waring et al 2015). Even when not directly addressing the case of antibiotic prescribing, this work also offers important lessons about the fate of new 'artefacts or tools to bring about behavioural change in the workplace' (Allen et al 2015). These tools may include guidelines, protocols or decision support aids (Berg 1997a and 1997b) and softer technologies that spread injunctions to 'speak up' about potential breaches of infection control in secondary care settings (Szymczak 2015). As new work in organizational sociology suggests, it is rare that guidelines either fail entirely or change practice as expected by the designers, but rather may succeed to the extent that they are incorporated into local accommodations between professionals and managers (Martin et al 2017). At the same time, more might be done to investigate the practice and effects of infection control, safety measures and changing practice in other institutions, for example care homes or prisons.

Interactions

One of the advantages of looking outside the hospital, is that we are able to bring back into view patient or lay practices. In considering patients, sociology demands attention to the 'clinical interaction' as a negotiated order rather than looking at the behaviour of a particular group separately. Though patients may be conceived of as having different priorities and strategies from doctors, studies of clinical interaction help understand how these are negotiated and shape clinical practice, and well as identify variations between different members of the two groups. Work by Britten (1995) is widely cited for the argument that patients consulting a general or family practitioner may approach the consultation with the hope and expectation of an antibiotic prescription – and that this affects the outcome – but this should not be taken to mean that patients simply get what they want. Research using conversation analysis shows that clinical interaction involves active work by both patients (or their representatives) and practitioners. Focusing on the

question of antibiotic prescription in the United States, Stivers (e.g.2002, 2007) documents parents of children trying to get or (sometimes) avoid antibiotics for their children. Conversation analysis of this kind allows for better understandings of the ways in which an option preferred by patients before the consultation can become the outcome. For example Gill (2010) describes how people pre-emptively name possible accounts for their symptoms, 'pressing for and against particular interpretations'. Public health messages that offer simple rules of thumb for antibiotic use – such as telling people about the average length of viral or bacterial respiratory tract infections – may be co-opted in such strategies by patients and not close the conversation or help avoid an antibiotic script. Qualitative research can help explore these emergent effects of interventions as they are made sense of by reflexive social actors.

Much behavioural science in this area has focused on the case of respiratory illness as an area where there may be 'unnecessary' antibiotic prescribing for viral infections or self-limiting bacterial illness (e.g. Francis et al 2008). More could be done to examine what are called 'interaction sequences' (Pilnick et al 2009) for different symptoms and kinds of infections, showing how the interaction covers the work of opening the encounter; presenting the complaint; completing an examination; offering evaluation or diagnosis; and treatment. Each of these sequences may well vary in different health systems and locations, and may be sensitive to whether people are consulting about themselves or a child (as in the work of Stivers). Studies in the conversational analysis tradition use sound or video recordings to account for the nuances of language use, silence and movement that make up negotiations about appropriate medical action. This is important because in interviews about their preferences or expectations of medicine people commonly draw themes of 'resisting' or 'avoiding' certain medications as part of particular moral discourses and performances (e.g. Murdoch et al 2012), talk which fits with the idea of minimizing antibiotic use but may not be a good source of evidence on practice. Studies of this kind also point to possible limits of asking patients to take responsibility for antibiotic stewardship, even if their preferences do appear to relate to the outcome. For example, Parry (2009) points out that patients are unlikely to ask 'why' questions in case they appear to challenge professional expertise (see also Pilnick and Dingwall 2011).

Ongoing work on different clinical interactions may also document the evolution of consultation styles and offer important pointers for efforts to create new negotiations and practices around antibiotics. Drawing on data from neurological consultations, Torien et al (2013) suggests that contemporary doctors use the strategy of 'option listing' to appear to share the decision and relinquish some authority. Systematic investigation of this strategy in other settings could be valuable to understand the effectiveness of antibiotic stewardship interventions such as delayed prescription, and possible developments of this approach. Referring to the prescription as an object also helps remind us that these encounters are not only 'conversational' but happen in specific spaces using particular tools. Here sociological understanding may help inform and evaluate the use of delayed prescription sheets or patient information leaflets, while the conversation analysis methodology in particular can help understand what elements make different stewardship interventions successful or limit their effectiveness.

Other more obviously technological interventions are those offering near-patient diagnosis (without the time and expense of a seeking laboratory culture away from the clinic). It is hoped this will help avoid the use of antibiotics for viral infections and of broad spectrum drugs when a more 'narrow' prescription would be effective. While this is clearly possible from a biomedical perspective, there is more to do to understand what inserting new diagnostic tools might do to the interaction and the clinical relationship. A good historical example comes from a study of 'cystitis' and the management of lower urinary tract infections. Pill (1987) points out that cystitis is a rather vague term for the symptom of burning pain in the urinary tract, but that a diagnosis of infection is by no means assured, making for uncertainty about an

antibiotic prescription. She argues that when general practitioners had limited access to microbiology they were often inclined to treat people without a firm diagnosis. Indeed Berg (1992) argues this is not unusual but that work in general practice is often focused on deciding what to do – the clinical disposal – rather than looking for a diagnosis. Pill suggests that 'it could be argued that a greater use of urine testing [in the clinic] would provide hard clinical evidence of infection and thus improve the care given in general practice by rationalizing the diagnosis. However, paradoxically, routine use of this test [in the 1970s] seems to bring further problems' (1987, p278). For patients, getting a negative test that conflicted with their experience of painful symptoms worried and upset many women, a problem exacerbated when doctors reacted to the certainty promised by the test by reducing the time spent discussing other possible causes. These responses created the possibility of 'increasing disenchantment' between patients and doctors over repeated consultations. Sociology would suggest that such unintended consequences of near-patient diagnostics should be considered alongside their effects on antibiotic prescribing and that the effects might need studying beyond of a single consultation and its immediate aftermath. Like studies of interventions as resources in interactions, more research should be done on the way in which the anticipated consequences of particular diagnoses are important in the decision making of practitioners, who reflexively process the likely effects of the labels they give patients (Rasmussen 2017).

Inequalities

An important challenge for those doing controlled studies of stewardship interventions is translating effectiveness outside the special setting of the trial and into the wider world; the so-called implementation gap. This has a social and spatial element because prescribing surveillance suggests that there are quite significant differences in antibiotic prescribing according to deprivation and locality. For example, it has been proposed that general practitioners are more likely to prescribe antibiotics to those with lower socio-economic status (e.g. Covvey et al 2014, Cope et al 2015). Explaining such variation or inequalities appears an important site for a sociological contribution, not only through comparative studies of clinical interactions – perhaps using Rasmussen's (2017) concept of 'diagnosing with anticipation' – but also research exploring the distribution of infections and of practices of self-care (or neglect) that translate to need for antibiotics and their use.

  In their classic paper, Calnan and Williams (1991) explore the salience of health and health practices in different households and argue that working class respondents appeared more likely to accept an antibiotic prescription than middle class respondents, especially women, who might resist medication. There is more to do to explore this finding and patterns of acceptance, use, non-use, resistance and retention especially given more recent survey data suggesting that younger people and in particular educated younger women are more likely to 'stockpile' antibiotics for use without professional sanction (McNulty et al 2007, Populus 2014). Focus groups with different age groups, family forms and urban, rural or post-industrial settings in Wales (Hawkings et al 2012) imply that while some affluent young families do 'resist' antibiotics along with other forms of medication, antibiotics are particularly useful resources for families with young children or people in insecure jobs who cannot afford to take time at home while an illness runs its course – though the same groups may experience problems in taking as prescribed. Work by Vuckovic (1999) is suggestive here by conceptualizing medication as a 'time saving device'. I have noted above that interviews and focus groups are particularly at risk of encouraging moral work by respondents to distance themselves from the stereotype of the 'pill popper' (Will and Eborall 2011). Research using observations, object-centred interviews or walkarounds outside the clinical interaction could explore other meanings for antibiotics and their place in family or domestic medication practices (Dew

et al 2014). Theoretically studies of this kind could also elaborate the 'medication practice' or 'adherence work' that shapes the use of antibiotics just as other medicines (see McGoy's 2009 work on anti-retroviral therapy). It would also be sensitive to what Lehoux et al (2009) identify as 'local contingencies associated with the heterogeneity of users' in work combining interviews and observations to identify the distance between patient manuals and patient use of technologies including intravenous antibiotics. Such heterogeneity would need to include gender and socio-economic status or employment and their intersections with other factors such as ethnicity (see Mangione-Smith et al 2004 on this issue in the United States).

In considering the importance of childcare and work pressures it is also tempting to return to older work in medical sociology, which often started from questions about variation in illness and care and might support an argument that different 'needs' as well as choices are governing prescribing variations from a national perspective (e.g. Antibiotics Research UK 2015). This may be a factor in prescribing for dental infections in primary care, where people cannot afford to see a dentist (see Cope et al 2015), but there is a need for further research on this issue to disentangle the efforts of the distribution of infection, access to routine care, and use of general practice. A paper by Williams and Gabe (1987) shows wide variations in childhood infectious disease in the 1980s, where children from poorer groups had more, and more severe, bronchiolitis, bronchitis and otitis media. Lauritzen (1997) and Reading (1997) both explored continued inequalities in childhood infection in the 1990s, and Bartley (1998) studied the interconnected contributions of poor housing, low incomes and job insecurity or unemployment on health. Such research raises critical questions about the different pressures on people to be 'present' at work in the contemporary setting, and the influence of poor nutrition, housing and stress on patterns of infection and should inform studies of antibiotic use among precarious workers, those suffering poverty and their doctors.

Though relatively little has been published that directly references the problem of antimicrobial resistance as it is now being framed in policy and public health we hope this Virtual Special Issue shows how existing work in the sociology of health and illness may well be able to contribute. Moving beyond behaviour, efforts to intervene in professional practice need to be sensitive to embedded routines and logics and could build on existing efforts to shape hospital work in the name of safety. We suggest that the 'meanings' of different infections will be highly relevant to patient engagement with AMR and influence the transmission of infections. A better understanding of people's sense of responsibility and the causes and effects of infection may help avoid tensions or misunderstandings between professionals tasked with antibiotic stewardship and patients with symptoms that worry them. Having started with examples from hospital acquired infections in surgical wounds, I ended with the management of suspected urinary tract infections and dental health in primary care. Studies of the experience and management of these and other infections may help elaborate opportunities and risks for stewardship interventions beyond the case of respiratory tract infections, and perhaps explain some of the difficulties and dangers of translating interventions from trials into routine practice. Returning to an older sociological tradition of exploring variations in illness and healthcare practice according to socio-economic status, employment type, and region, may be particularly important to avoid creating new inequalities if antibiotic stewardship policies are enacted without reference to the social and economic pressures on patients, and efforts by general practitioners to respond.

CONTENTS

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