

Communicating the Risk of MRSA: The Role of Clinical Practice, Regulation and Other Policies in Five European Countries

Introduction

Healthcare associated infections (HCAIs) place a significant burden on health systems in terms of both morbidity and mortality, and their effects are felt far beyond just those utilising healthcare services [1]. An already serious situation is now being exacerbated by the growth of antibiotic-resistant bacteria, such as methicillin-resistant *Staphylococcus aureus* (MRSA). MRSA is a bacterium which is resistant to β -lactam antibiotics, a group of antibiotic treatments which includes penicillin and cephalosporin. Infection with MRSA can lead to a variety of sequelae, including ventilator-associated pneumonia, chronic wound infection, bloodstream infection (bacteraemia) and septic conditions, which in some circumstances can lead to death.

The prevalence of MRSA varies across Europe, with a general trend of increasing prevalence from north to the south [2-4]. The reasons for these observed differences are not yet fully understood, although variation in prevention and control strategies [5], design of healthcare facilities [6], staff to patient ratios [7], patterns of antibiotic usage [8] and the implementation of antibiotic stewardship [9, 10] are thought to be contributing factors. As travel between European states becomes more common, with citizens free, within certain limits, to pursue elective treatment in a European country other than their own, the scope for transmission of infectious pathogens to areas where they are not endemic becomes ever greater [11, 12]. Therefore, cross border regions now face a particular challenge in coping with patients coming from neighbouring countries where different regulations and practices are in place to prevent, detect and respond to infectious agents [13]. This issue has led to the formation of a number of MRSA networks, founded on bilateral agreements between countries with shared borders about how best to manage the issues outlined above.

Increases in the burden associated with HCAIs and the growth of antimicrobial resistance have led to heightened awareness both within the lay population and among politicians. The Chief Medical Officer in the UK has even gone so far as to place the threat posed by antimicrobial resistance on a par with that of terrorism [14]. The European Centre for Disease Prevention and Control (ECDC) has placed the “Antimicrobial Resistance and Healthcare-associated Infections Programme” among its top priorities for the future [15]. The ECDC has

also stated that a major part of the problem stems from deficiencies in the way health related issues are communicated, and has encouraged EU member states to improve their risk communication strategies [16].

Risk communication is a wide and multi-faceted field, and is considered an important approach in the fight against the spread of infectious diseases through the impact it can have on the adoption of appropriate behaviours e.g. frequent hand washing to limit carriage and infection [17]. Recent research has highlighted a number of areas which are key to understanding effective risk communication, such as the nature and quality of information provided to patients and health care workers [18], patients' and the general public's perceived information needs [19, 20] and role of the media [21]. However, little research has been carried out into the impact of institutional arrangements on specific risk communication strategies.

We conceptualise risk communication as not simply explicit communications, but also the implicit messages of institutional arrangements (differences in policies, inconsistencies of implementation, etc.). In order to test this assumption, we examined the implementation of various MRSA policies across five European countries for any evidence that environmental factors contribute as implicit and 'autonomous' risk communication next to traditional explicit and 'voluntary' forms.

The article begins by discussing the situation in each of the countries with regards to the following areas, while reflecting on the underlying epidemiological rationale for each:

- Data and reporting mechanisms,
- Regulations and guidelines,
- Health policy approaches with a focus on risk communication, and
- Implicit messages of current practices.

In the second section, we move on to discuss how different national strategies to contain MRSA infection are implicit 'messages' and contribute to explicit ~~also correspond to~~ risk communication strategies.

Methods

We collected information on the situation with regards to MRSA in five European countries: Austria, Germany, Netherlands, Spain and the UK. These countries were chosen as they represent varying prevalence, response strategies, overall health system organization and modes of communication.

A template was designed to systematically collect information about five areas: 1) data collection and reporting mechanisms; 2) the regulatory framework; 3) clinical guideline design; 4) implementation of guidelines and 5) other relevant health policy measures. The intended and unintended effects of policies in each of these categories were then compared to explicit communication strategies first by country, and then across countries. Information was drawn from scientific and grey literature and complemented, where necessary, by stakeholder interviews.

Results

To help interpret the results, and how the various measures compare to one another, we developed a stepwise classification for different stages of MRSA (see Table 1).

Table 1: Classification of MRSA from an infection control perspective

Table 2: Overview: MRSA in five EU countries

Data situation

Comprehensive data on prevalence is difficult to obtain as most mandatory and voluntary surveillance systems were found to only cover MRSA bacteraemia. Point prevalence studies and surveys that have attempted to capture the situation have also been based on information provided by hospitals on a voluntary basis. This has contributed to the sporadic nature of evidence around MRSA and thus current data does not appropriately reflect the ubiquitous nature of the treat of infection [3]. The majority of countries (Austria, Germany, Spain, UK) only report bacteraemia (level III), which is the most serious consequence of infection and only present in a minority of cases. The UK, however, also screen for MRSA status prior to elective surgery, but this information is not officially reported. The Netherlands stands out with frequent reporting of colonisation and infection (level I and II).

Moving the reporting downstream with the reporting of bacteraemia, level III, is posited to be one way to keep the absolute numbers down. In regards to communication, this [could](#)

contributes to keeping perception of infection rates artificially low. This ~~is~~ could be appealing to policy makers as the small reported cause less concern than if the true prevalence of infection were to be revealed [22-24]. It is, however, only an artefact of the reporting – and not reflective of the underlying epidemiology of the infectious disease. There is no consistent information about the “contagious burden”, meaning the provision of information about colonisation and infections, from level I on where MRSA is contagious and can be passed to others [25].

Regulatory bodies

Regulatory bodies are built based on the political structure of the country where they are based. In Austria, Germany and Spain health care provision and management is in the responsibility of federal states or autonomous communities. The Netherlands and the United Kingdom follow a national approach. Having different regulatory bodies could possibly lead to variability in terms of guidelines and recommendations and their implementation. The variability of recommendations within and across countries could contribute to the perception of inconsistency.

Guidelines

The Netherlands has opted to pursue an active screening policy (“search & destroy”). Risk-based testing is in place in Austria, Germany, Spain and the UK, with the UK requiring screening of elective admissions to hospitals. Isolation practice for positive cases is basically the same in the five countries. However, the time lag between entering the hospital and being identified as MRSA carrier is critical as a variety of admission procedures, examinations and clinical investigations at the beginning of a hospital stay increase the likelihood to spread infectious diseases. The Netherlands, again, stand out by placing patients with an unknown MRSA status in isolation rooms; Spain places patients awaiting their results in isolation as well as, whenever possible (individual room availability), those who are previous carriers or high risk patients (in one autonomous community Catalonia).

Healthcare workers in the four countries (Austria, Germany, Spain, UK) are not screened on a regular basis, meaning that those who are a high risk group in every countries’ guidelines and work where the contracting and spread of infectious disease occurs most readily are unaware of their own MRSA status [26]. The Netherlands screen staff regularly.

The rigor of infection control is not appropriately reflected in the guidelines: MRSA patients are constantly contagious and not only after identification; healthcare worker fall under the

risk groups for screening in every country, but are, with the exception of the Netherlands, not screened.

Implementation

All countries investigated have put legal obligations in place to implement their guidelines. However, only sporadic, if any, verifications and checks are being carried out. Concerns about the implementation of the guidelines are frequently raised. [SA recent surveys](#) from Germany [and the UK](#) supports these findings. The authors showed that a minority of the hospitals have consistently implemented guidelines [27-28].

Health policy

All the countries under investigation have increased their awareness for MRSA and have developed national action plans, regional and international networks of hospitals and laboratories, antibiotic stewardship, strengthened their legislation and created incentives to reduce the prevalence of MRSA [9]. The consistent adoption of this policy in the guidelines and the implementation into the daily practice is, however, subject to discussion. The gap between the policy and its implementation is not just a medical problem, but also influences the perception of health risks, and could affect compliance with the intended behaviour [29].

Communication

Information and knowledge play a crucial role in the management of MRSA, and European health policy also puts special attention on communication. All five countries thus prioritise the provision of information to various target groups (health professionals, patients and general public). The explicit information strategy, however, is only one aspect of this ([“voluntary communication”](#)); another aspect is how messages that are expressed in the official statements are ‘executed’ on the ground of the daily reality of health care ([“autonomous communication”](#)). Infection control measures, their implementation into the medical environment and their frictions are tacit acts of communication yet little attention has been spent on how to monitor and improve the way they contribute to the conveyance of key health messages.

Discussion

Epidemiological rationale

Infection control approach

There are, generally speaking, two basic strategies for responding to infectious diseases that emerge from the analysis: a 'specific' and a 'general' approach.

The specific approach relies on the identification of those patients already infected with MRSA. Once an MRSA patient is identified and known ('red flagged'), appropriate measures can be taken. These measures range from sanitation of skin colonisation and/or treatment of the infection. The patient should also be isolated from the hospital environment in order to prevent the transmission of the pathogen. Once an MRSA patient has been identified, health care workers have to wear personal protection equipment and apply stringent hygiene measures. The MRSA patient's room is often labelled with a sign signalling the contagious status. There is a general consensus regarding isolation and hygiene practices. However, the crucial choice of strategy for identification in the specific approach is controversial. Only the Netherlands has a pro-active screening policy; all of the other countries studied used a process of reactive screening based on risk assessment, with the UK also requiring pre-hospital screening for elective admissions. Hospitals across the four 'reactive' EU countries (Austria, Germany, Spain, UK) appear very reluctant to screen patients for a number of reasons. One is that the care for and treatment of MRSA patients places greater demands on the attending nurses and clinicians, meaning that there could be an incentive to avoid correct MRSA classification. Additional measures such as spatial requirements (single isolation rooms), differential treatment guidelines, and consequences for staff and ward routines aggravate the situation. Also at the hospital level it ostensibly requires more time and resources to care for MRSA patients and therefore those facing budgetary pressure may possibly be more inclined to avoid diagnosis, despite the fact that the costs of cases progressing to bacteraemia may outweigh the costs of an active screening policy [30-34].

If contagious patients are not identified, a 'general' approach with stringent measures to guarantee good hygiene has to be adhered to by all healthcare workers, patients and visitors. This system of infection control includes, among others, requirements such as strict hand hygiene, regular cleaning and disinfection of surfaces. To promote the general hygiene approach good communication is crucial to ensure that everyone is aware of what they need to do in order to avoid infection and stop further spread. Frictions between infection management and communication could affect the adoption of the recommended behaviour.

Ethical Problems

The handling for MRSA patients raises some ethical questions regarding whether there is equal treatment of isolated and contagious patients. The restriction of physical transport and

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transfer forms part of the infection control recommendations in the European countries investigated. However, it is an increasingly controversial and sensitive aspect of the prescribed treatment of MRSA patients as many feel it could compromise the quality of clinical care [35]. Most guidelines recommend that some invasive interventions be confined to the room used by MRSA patients [36]. In the case where interventions performed in the patient's room would be better carried out elsewhere, the lack of an optimal environment can lead to reduced performance on the part of clinicians. Infectious patients are put at the end of the day's surgery schedule and are more likely to be postponed due to emergencies in the surgical programme. The avoidance of invasive diagnostics alongside being the "last operation on the schedule" could comprise the medical treatment of an often critically ill patient.

Organisational Aspects

MRSA is also an occupational health problem. Healthcare workers are not routinely screened for MRSA colonisation or infection - apart from in the Netherlands. This reluctance to identify infectious staff could be seen in the context of healthcare organisation. If a staff member is colonised with MRSA they are not allowed to work in their usual locations. This poses a burden to the workplace organisation in terms of the potential for inconsistent labour supply, in particular in an already overstretched working environment. Hospitals and countries in which the intensive care unit (ICU) carer/nurse to patient ratio is 1:1 report basically no problems of nosocomial infections [37]. This adds weight to the hypothesis that a major contributor to increasing prevalence of MRSA is the high patient-healthcare worker-ratio [38].

Architecture

The guidelines also point out the importance of spatial distancing and the role of architecture – a challenge which has not been met by modern hospitals and it remains unclear whether this concern regarding the spread of infectious disease will be met in the future [6].

Risk communication strategy

The 'general' approach i.e. the basic tools for fighting an infectious disease epidemic, all feature prominently in all national guidelines: knowledge, training, information, networks and collaboration. But the question remains of how well are the recommendations implemented at the provider levels especially in terms of their risk communication practices.

Conflicting messages

From a patient perspective, the discharge of MRSA patients is an ostensibly incongruent routine. After being treated in strict isolation and under a stringent hygiene regimen – patients are simply discharged and informed that MRSA is no risk for healthy people [39]. This dissonance could lead to confusion and distress for patients, relatives and visitors and adds further to potential misperceptions of their health risk to others.

Knowledge

Despite the laws and efforts surrounding improving information and communication, knowledge levels have been mixed. The lack of knowledge in healthcare professionals is seen as an influencing factor for increasing prevalence of nosocomial infections [40-43].

Risk communication policy

The risk communication policies of the five EU countries –were found to contain only information relating to risks faced by people directly involved in healthcare, such as hospital staff and patients. These policies is were based on the same risk assessment that is used to determine which patients should be screened for MRSA. It focuses on healthcare workers, long term care, chronically ill patients and patients facing surgery. There has only been little effort to address MRSA as problem in and for the general population [44]. This narrow view is congruent with the lack of concern for the role of other factors, The entire field of contributing risk communication factors such as behaviour, implementation of guidelines, etc.etc., is not reflected seen in other areas.

Media Coverage

The consensus in the literature is that the UK media coverage, especially within the tabloid newspapers, has been at times sensationalist. However, the pressure placed on governments in response to the extensive media coverage has played a significant role in a number of policy changes which have contributed to the decline in incidence of deaths and bacteraemia associated with MRSA [45-46].

Public Perception

The infection threat posed by MRSA is difficult to communicate. Researchers have blamed contradicting risk communication about necessary hygienic measures as one problem [47]. They see that even necessary cleaning routines have not been implemented in hygiene plans [47]. More importantly, risk communication messages might have influenced the risk

perception of healthcare workers, patients and the public inappropriately. The message that MRSA is not an infectious diseases agent which can lead to outbreaks outside of healthcare facilities and also does not do harm to family members has direct consequences for the epidemiology of MRSA, and could in turn have led to the perception that MRSA is a harmless pathogen only affecting those who are already ill [39].

Conclusion

The data situation in the countries is patchy at best, and thus it is difficult to offer up any firm conclusions regarding the overall burden of disease in the countries studied. What is clear, however, is that knowledge and information about the infectious disease burden is limited in the general population, and this lack of clarity has led to a growth in misconceptions surrounding the threat of MRSA.

The variability of recommendations within, and across, countries could be contributing to the perception of inconsistency and therefore this should be looked, potentially as part of a wider strategy designed to improve risk communication. Having inconsistent guidelines and practices in place may also be affecting the level at which recommended behaviours are adopted.

The risk communication of MRSA has several weaknesses: there are misleading messages in the official statements and a gap between the official communications and guidelines, with inconsistent adoption of the latter at the provider level.

This discrepancy between the official, explicit health messages around MRSA and the implicit messages stemming from the performance of infection control measures should therefore be a key target for those wishing to improve the accuracy of perceptions regarding the health risks of MRSA.

Recommendation

The increasing burden of antimicrobial resistance and health care associated infections has been reflected in growing public awareness, for example with major health policy organisations urging countries to improve their risk communication and MRSA prevention strategies. These ought to be revised to also address the general public. Thus far, most countries have adopted a universal risk-based approach addressing affected groups, without differentiating between groups, or addressing the wider public. Health policy and practice has

also focused on individual infection control measures and place the majority of responsibility on the individual. Organizational aspects (patient- healthcare worker ratios, architecture, etc.) have not been prominently discussed. The rational use of antibiotics and antibiotic stewardship is a significant move designed to place greater responsibility for the control of HCAIs on medical professionals. However, the key message, often included in national risk communication strategies, that MRSA is a problem only for those who are already ill, is misleading. In fact, MRSA is a problem affecting society as a whole. MRSA is a problem for healthy people as they can transmit the disease; MRSA is a problem for treating too many patients in too narrow spaces. MRSA is a problem because MRSA patients are only reluctantly identified. And finally, MRSA is a problem because the explicit and implicit messages of MRSA are often inconsistent if not contradictory.

The problem of health care related infections and antimicrobial resistance can only be tackled in a more holistic approach regarding reconsideration of affected groups, healthcare organisation, architecture and a rational use of antibiotics – and by revising a risk communication strategy accordingly.

Declaration of interests: All authors declare that they have no conflicts of interests.

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