Journal Watch

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Journal of Infection Prevention
2017, Vol. 18(1) 40–42
DOI: 10.1177/1757177416683788
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The journal watch feature is provided as a service to our readers. The intention is to highlight new research and other developments in infection prevention and control and related fields, published elsewhere. A brief description of each article and its main findings is given here; readers are encouraged to refer to the full published article for the details of the work. The authors and the editorial management group would welcome feedback and recommendations for articles to feature in this column; for comments and recommendations please contact neil.wigglesworth@gmail.com or editor@ips.uk.net.

The membership of the Infection Prevention Society (IPS) and the readership of the *Journal of Infection Prevention* is a mixed audience and we try to cater for all needs in Journal Watch. In this issue, we have qualitative and quantitative work, we have something for intravenous practice specialists and something of interest (we hope) to those working in communicable disease control and immunisation and vaccination. To start with, two qualitative studies both of which describe influences on the behaviours of healthcare workers and, in the case of the latter, the public. The first paper is from our friends at the *Journal of Hospital Infection*.

Gould DJ, Hale R, Waters E and Allen D. (2016) Promoting health workers' ownership of infection prevention and control: using Normalization Process Theory as an interpretive framework. *Journal of Hospital Infection*. doi:10.1016/j.jhin.2016.09.015.

This, by the authors' admission, is a retrospective analysis of an initiative to reduce healthcare-associated infection (HCAI) and, in particular, *Clostridium difficile* infection, in a large healthcare organisation. In that respect, it could be described as nothing unusual; many such complex initiatives are undertaken and reported. The reasons for including it here are twofold; first, it seems to describe an approach that eschews punitive and 'top-down' approaches and makes a genuine attempt at creating a 'learning culture'. Second, the retrospective application of 'Normalization Process Theory' (NPT) is an interesting exercise and should lead to further work to apply this sociological theory prospectively to the design of infection prevention and control (IPC) interventions. In their introduction, the authors

discuss the concept of 'ownership' and comment that it is generally ill-defined, if defined at all and that, all too often in healthcare, improvement initiatives are 'top-down' in nature; such top-down approaches, they argue, do not promote ownership. This is a qualitative study that aimed to explore the meaning of ownership in the context of IPC and to evaluate the impact of the intervention, an action plan that was intended to promote ownership. The study, conducted 18 months after the intervention began, was a series of qualitative interviews, conducted with a purposive sample of a range of healthcare workers (HCW) from a range of disciplines and levels of seniority. Inductive analysis was supplemented by the application of NPT as a theoretical framework to help explain the findings. The purpose of NPT is to explain how interventions, such as IPC ownership, are incorporated into everyday routine practice; arguably one of the Holy Grails of IPC. The themes that emerged from the interviews were compared with the elements of NPT that describe successful implementation; coherence, cognitive participation, collective action and reflexive monitoring. Briefly, the initiative appears to have promoted empowerment in the organisation and NPT suggests that it has done so by creating a climate of learning and no-blame in which individuals felt able to talk openly about challenges, report difficulties, initiate change and innovation, and identify solutions. These findings are supported by a range of quotes from the participants and the success of the work is illustrated by a range of improvements in HCAI data, including a significant reduction in *C. difficile*. If you are unfamiliar with NPT (I am) this is a good place to start. The authors readily admit that 'ownership' cannot explain all the improvement experienced and, quite rightly, point out that NPT needs to be used to design interventions rather than just attempt to explain them retrospectively. We look forward to that piece of work.

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Our second qualitative piece of work is co-authored by one of our IPS Board Members and is the focus of her PhD. Risk perception is an important issue in health and Dr Emma Burnett and colleague, writing in the *American Journal of Infection Control* (AJIC), discuss risk perception in the context of *C. difficile*.

Burnett E and Corlett J. (2016) Understanding risk perceptions and responses of the public and health care professionals towards *Clostridium difficile*: A qualitative interpretive description study. *American Journal of Infection Control*. doi:10.1016/j.ajic.2016.07.020.

In contrast to the first study described above which used individual interviews with HCW only, this study used focus groups and included both HCW and the public to explore their risk perceptions related to *C. difficile*. To begin with, there is a discussion about the theories of risk perception; probably the key message from this is that risk perception is a mental construct about uncertain events and is affected by a range of influences including, but by no means limited to, risk communication and the sources of information about risk. In the context of HCAI, including *C. difficile*, these sources include both health professionals/organisations and the mass media (particularly in the case of high profile outbreaks). This study illustrates the size and complexity of conducting detailed qualitative enquiry; the 15 focus groups described (8 public and 7 HCW) must have generated a huge amount of very rich data for analysis. Once again purposive, combined with some snowball sampling recruited a total of 39 members of the public and 29 HCW and both groups were representative of two distinct geographic areas, one an area that had experienced an outbreak and one that had not. The detail of the analytical approach is beyond my abilities to summarise, but used an interpretive description methodology; and the detail of the analysis is both described in some detail and reference is given to previous publication of the approach, for those who wish to explore in more detail. The results identified four main themes, some of which had nuanced meaning for public versus HCW; these were: being vulnerable; attribution of responsibility; making sense of competence; and evaluation of the communicators. Being vulnerable to either the health impact of *C. difficile* (public) or being blamed (HCW) is relatively straightforward to understand. Both attribution of responsibility and making sense of competence seem to relate to issues of blaming (various) others and reinforcing the participants' own view of themselves as competent. In simple terms, it seems to suggest they all saw cases of *C. difficile* as someone or something else's fault; not an edifying finding. The final theme concerned, in part, the mass media and their communication of risk. It seems that most of the participants claimed to not believe and to deride the media for their coverage but described a lack of expert communication that perhaps leaves a void for the

media to fill. This study makes a strong case for the need for expert risk communication of HCAI risks, especially when HCAI 'hits the news'.

We all accept that educating prescribers is key to antimicrobial stewardship programmes, but how do we access front-line staff? This paper from AJIC has a novel approach.

Pisano J, Pettit N, Bartlett A, Bhagat P, Han Z, Liao C and Landon E. (2016) Social media as a tool for antimicrobial stewardship. *American Journal of Infection Control* 44: 1231–1236.

This is an innovative study which highlights the potential of social media platforms as an education tool, especially among busy front-line staff. While acknowledging the logistical difficulties in providing training to junior doctors using traditional methods, the researchers trialled a system whereby they attempted to engage doctors on the antimicrobial stewardship programme's Facebook and Twitter accounts by hosting daily medical trivia contests. Questions were focused on infectious diseases, antibiotic knowledge and the study group's internal website resources, including clinical pathways. The study recruited trainee doctors to follow the study social media accounts for a six-month period and completed a pre- and post-survey, evaluating social media use, knowledge, attitudes and beliefs regarding antibiotic use and resistance and also awareness of the hospital's resources on antimicrobial stewardship. Online participation was incentivised through gift card rewards. The aim of this study was to disseminate educational information and increase awareness of the antimicrobial stewardship programme tools available to prescribers. Although both Facebook and Twitter were used equally by the study group to post information and trivia questions, Twitter was the platform most used by participants to engage with the posts. No effect was observed on the frequency of order sets used; however, an increase in general antibiotic and ID knowledge, confidence in antibiotic prescribing and self-reported clinical pathway use was observed. In conclusion, this study shows that we need to explore novel ways to successfully reach, engage and promote mindfulness on clinical issues among practitioners. The major limitation of this study was the small sample size: only 39 medical doctors completed both pre- and post-intervention surveys and followed social media posts. This probably precluded the full impact of the intervention to be captured. Still it shines a light on the potential of social media-based education, especially to reach a younger generation of healthcare trainees and disseminate and reinforce important information not only on antibiotic use but also on other patient safety issues.

Peripherally inserted central catheters (PICCs) are a very important and valuable tool in intravenous therapy and systematic reviews give us real evidence for practice, another article from AJIC gives us both here;

Kramer RD, Rogers MAM, Conte M, Mann J, Saint S and Chopra V. (2016) Are antimicrobial peripherally inserted central catheters associated with reduction in central line-associated bloodstream infection? A systematic review and meta-analysis. *American Journal of Infection Control*. doi:org/10.1016/j.ajic.2016.07.021.

This may be the first robust evaluation of antimicrobial impregnated PICCs. It reports a systematic review (SR) and meta-analysis involving a heterogeneous sample of patients from intensive care, long-term care and general ward settings. PICC lines are increasingly being used in clinical practice as they are easy and safe to insert, durable and cost-effective compared with traditional CVCs. Still, like other CVCs, PICCs are associated with risks, including central line-associated bloodstream infection (CLABSI). This SR sought to determine whether antimicrobial-coated PICCs are associated with reduction in the risk of CLABSI in the published literature. Studies that included hospitalised patients who received an antimicrobial-coated PICC and reported outcomes of CLABSI or catheter colonization were included. Although six studies met the inclusion criteria, only five had complete data and were included in the meta-analysis. These included three retrospective, one cross-sectional and one pre-post study for a total of 6184 patients. In four of the five studies, populations included were generally at higher risk of CLABSI (e.g. burns, cancer, long-term care). Minocycline/rifampin-coated PICCs were used in three studies and chlorhexidine-impregnated PICCs were used in two studies. The review reported a 0.5% incidence of CLABSI in those who received antimicrobial PICCs versus 3.6% among those who received non-coated PICCs. Meta-analysis showed that antimicrobial PICCs were associated with reduced risk of CLABSI in comparison to non-coated devices (RR 0.17, 0.10–0.28). Available data suggest antimicrobial PICCs are associated with significant reduction in CLABSI, especially in patient populations that are, in general, at higher risk of CLABSI (intensive care, burns, cancer patients). All studies used observational designs which raises concerns about unidentified confounding and bias. Of note is the way the authors present their findings; they conclude that 26 patients need to be treated with antimicrobial-coated PICC to prevent one CLABSI. This is further reduced to 15 when restricted to patients who are at high risk of CLABSI. Presenting the findings as the number needed to treat to prevent one infection makes it easier for the reader to interpret. In agreement with current guidelines, this study suggests that use of these devices in patients at high-risk of infection may be effective; however, randomised trials of antimicrobial-coated PICCs, together with cost effectiveness studies, are needed.

The final article in this issue is related to communicable disease control and the epidemiology of measles in the context of the cohort of young adults who are currently

suffering the consequences of the extremely unfortunate and irresponsible scare stories about the Measles Mumps and Rubella (MMR) vaccine in the 1990s.

le Polain de Waroux O, Saliba V, Cottrell S, Young N, Perry M, Bukasa A, Ramsay M, Brown K and Amirthalingam G. (2016) Summer music and arts festivals as hot spots for measles transmission: experience from England and Wales, June to October 2016. *Eurosurveillance*; 21(44): pii=30390. doi:10.2807/1560-7917.ES.2016.21.44.30390.

This is a relatively straightforward report of an interesting epidemiological phenomenon. It is included for a number of reasons: first, because communicable disease control is an important part of the broader ‘family’ of infection prevention and control practice; second, it reminds us of the importance of immunisation and vaccination as a key population health intervention; third, because it illustrates some important aspects of epidemiological investigation, which not all infection prevention practitioners remember to utilise in their practice; and, finally, because it tells an interesting story. This collaborative study between the health protection services in England and Wales describes the impact of ‘festivals’ on an outbreak of measles that has been affecting parts of England this year. The authors describe 52 cases of measles associated with music and other arts festivals. Those affected were predominantly adolescents and young adults between the ages of 14 and 40 years, and in some cases individuals attended more than one festival while infectious. The methods are worth reading as a reminder of the importance of clear case definitions and descriptions of inclusion criteria; these can be applied to epidemiological investigation in any context. The results are also presented in a very clear manner with excellent graphical representation of both the geographical and temporal spread of the disease. The key messages from the results are: the majority of the cases were unvaccinated or had incomplete vaccination histories; a significant proportion were hospitalised (probably representing a bias to more severe cases being reported, therefore there were probably many unreported cases); and in some cases, individuals attended events while infectious and spread the disease across the UK and even into Europe. Genetic typing demonstrated that the cases were all connected and all related to an ongoing outbreak in London and the East of England. The message for those planning a trip to Glastonbury next year is, make sure you’ve had your MMR!

Whether you work in acute IPC, community IPC, an IV team, surveillance, immunisation and vaccination or communicable disease control, we hope there’s something to interest you in the *Journal of Infection Prevention* and in Journal Watch.