Institution: UNIVERSITY of WEST LONDON

Unit of Assessment: 3 | ALLIED HEALTH PROFESSIONS, DENTISTRY, NURSING and PHARMACY

Title of case study:

Informing national policy and practice in infection prevention and control to save lives

1. Summary of the impact

Healthcare-associated infections (HCAI) and antimicrobial resistance pose a constant threat to patients accessing healthcare in a range of settings. HCAI prolong recovery; delay discharge from hospital and, in extreme circumstances, cause serious disability or death. This case study describes the impact of the Epic (**e**vidence-based **p**ractice in **i**nfection **c**ontrol) research programme that focuses on the translation of evidence into national infection prevention and control guidelines for the NHS. Through evaluation of initiatives to reduce the threat of HCAI and associated disability to patients, and by generating evidence to support the development of government policy, Epic has led to safer care for people during periods of health-related vulnerability, and saved lives.

2. Underpinning research

The underpinning research was developed iteratively from an initial research contract from the Department of Health (DH) in 1998, resulting in Epic - a long-term multi-professional nurse-led research programme. Epic has generated a portfolio of research, implementation, education and evaluation activity that has had a sustained impact upon the practice of healthcare professionals and the quality of care provided for patients throughout the NHS.

Key aspects of the research and its impact are:

- *National evidence-based guidelines*: a programme of systematic review and evaluation of evidence across five key areas of clinical practice underpinned the development of the first national evidence-based guidelines for preventing HCAI in NHS care facilities in England (Epic1), and subsequent updating to incorporate new evidence (Epic2). These guidelines have been widely cited by other national and international infection prevention guidelines;
- *Dissemination of evidenced-based practice*: driving effective infection prevention and control practice by using Epic as a framework for education, training and local implementation in the NHS in England. The dissemination programme was undertaken in collaboration with key stakeholders including: the Modernisation Agency, the Department of Health, the Infection Prevention Society, the NHS University (now the NHS Core Learning Unit), the Health Protection Agency, and industry partners;
- *Evidence evaluation to underpin national strategy and policy*: the systematic review and evaluation of evidence was instrumental in defining national policy in vital aspects of HCAI prevention including: the roles and responsibilities of community infection control nurses, screening for methicillin resistant *Staphylococcus aureus* (MRSA), high impact interventions for the prevention of urinary catheter associated infection, central vascular catheter related infections, healthcare worker uniform policy, and pseudomonas infection from water systems;
- *Evaluation of a national programme to reduce MRSA bloodstream infections*: to identify and confirm key factors for successful implementation of a programme to reduce risks to patients from HCAI, and to inform translation to clinical practice and the prevention of other HCAI;
- *HCAI research network and service user research forum (SURF)*: established to engage researchers and the public in identifying research priorities, and to support the work of the independent advisory committee on antimicrobial resistance and healthcare associated infection (ARHAI).

Key researchers in this programme of research at the Unviersity:

- Heather Loveday, Professor of Evidence-based Healthcare (1994-present);
- Robert Pratt, Professor of Nursing (1994-2011) retired;
- Dr Peter Harper, Senior Lecturer (1994-2010) retired;
- Dr Carol Pellowe Principal Lecturer (1994-2011);
- Jennie Wilson, Research Fellow (2005-2012) and Reader 2012-present.

Supporting Grants (*Funder*)

- 2012-2013: Epic National Guidelines for the Prevention of HCAI in NHS Hospitals in England. Evidence updating and revision; **£115,000** *DH Policy Research Programme (PRP).*
- 2012: Rapid Systematic Review of Pseudomonas and healthcare water systems; **£35,000** *DH PRP*.
- 2012-2013: Patient Experience of MRSA Screening – A qualitative study; **£65,000** *DH PRP*
- 2009-2013: National HCAI Research Network and SURF; **£700,000** *DH PRP*.
- 2010-2010: Exploratory case study of health care economy HCAI improvement examples; £55,000 *DH PRP.*
- 2009-2010: Look Back: A Multiple Methods Evaluation of the DH (England) Cleaner Hospitals Programme to Reduce MRSA Bloodstream Infections; **£90,000** *DH PRP.*
- 2005-2006: An evidence review of the microbiological and social significance of uniforms and uniform policy in the prevention and control of healthcare-associated infections; **£31,500** *DH Patient Environment Division*.
- 2004-2005: Systematic review of the evidence for interventions for the prevention and control of methicillin resistant *Staphylococcus aureus* (1996-2004); **£30,000** *DH Communicable Disease Policy Unit (CDPU).*
- 2003-2003: A Comparison of International Practices in the Management and Control of Healthcare-association Infections; **£18,500** National Audit Office *(NAO).*
- 2000-2002: A multiple methods review of the roles and responsibilities of community infection control and communicable disease control nurses in England; **£180,000** *DH CDPU.*
- 2004-2006: The CHART Study; **£325,000** *DH PRP.*
- 2005-2005: Systematic review and guideline development of interventions to prevent HCAI in Hospital settings: update; **£101,850** *DH CDPU.*
- 2000-2003: Systematic review of interventions to prevent HCAI in Community and Primary Care settings; **£450,000** *DH CDPU.*
- 1998-2000: Systematic review and guideline development of interventions to prevent HCAI in Hospital settings; **£150,000** *DH CDPU.*

3. References to the research

1. Pratt RJ, Pellowe C, Loveday HP, Robinson N, Smith GW, and the Epic guideline development team; Barrett S, Davey P, Harper P, Loveday C, McDougall C, Mulhall A, Privett S, Smales C, Taylor L, Weller B, and Wilcox M. (2001). The Epic Project: Developing National Evidence-based Guidelines for Preventing Healthcare Associated Infections. Phase 1: Guidelines for Preventing Hospital-acquired Infections. *Journal of Hospital Infection* 47(Supplement): S1-S82.

2. Loveday HP, Pellowe CM, Jones SRLJ, Pratt RJ. A systematic review of the evidence for interventions for the prevention and control of meticillin-resistant Staphylococcus aureus (1996-2004): report to the Joint MRS Working Party (Subgroup A). *Journal of Hospital Infection* May 2006;63 (Supplement 1): S45-S70

3. Pratt RJ, Pellowe CM, Wilson JA, Loveday HP, Harper PJ, Jones SRLJ, McDougall C, Wilcox MH. epic2 - National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals. *Journal of Hospital Infection* 2007 January; 65(1): supplement 1.

4. Wilson JA, Loveday HP, Hoffman PN, Pratt RJ. Uniform: an evidence review of the microbiological significance of uniforms and uniform policy in the prevention and control of

healthcare-associated infections. Report to the Department of Health (England). *Journal of Hospital Infection* August 2007; 66(4):301-307.

5. Curran E, Harper P, Loveday H, Gilmour H, Jones S, Benneyan J, Hood J, Pratt R. Results of a multicentre randomised controlled trial of statistical process control charts and structured diagnostic tools to reduce ward-acquired meticillin-resistant *Staphylococcus aureus*: the CHART Project. *Journal of Hospital Infection* 2008*;* 70:127-135.

6. Loveday HP, Pellowe C, Steiner J Primary Care Organisations: identifying best practice for preventing healthcare associated infections through commissioning. A Confidential Report to the Department of Health HCAI Cleanliness Division, November 2010.

7. Loveday HP, Harper P, Dunnett A, Lido C, Pellowe C, Steiner J and Robert J.Pratt. Look Back: A Retrospective Evaluation of the Department of Health (England) Cleaner Hospitals Programme to Reduce MRSA Bloodstream Infections. A Confidential Report to the Department of Health HCAI Cleanliness Division, January 2010.

4. Details of the impact

The Epic Guidelines for hospitals, and community and primary care have been published in the peer reviewed Journal of Hospital Infection (JHI) on three occasions and made free-to-view by the publishers Elsevier. The Epic2 Guidelines published in 2007 were among the top ten cited papers in Journal of Hospital Infection in 2008. Several summary articles were disseminated via journals with a wider readership. In 2011 BioMedLib included four of our publications in the top ten articles published in the evidence-based infection prevention and control guideline domain.

Epic2 is cited in the USA (Hospital Infection Control Practice Advisory Committee/Centers for Disease Control) Urinary Catheter Guidelines (2009) and the Australian National Guidelines (2010) as one of the systematically developed national guidelines used to generate the questions for the systematic review (CDC) and recommendations within the guideline (ACSQH). The WHO Hand Hygiene Guideline (2009) included Epic2 as one of the guidelines reviewed for rigour of development and consistency with the final WHO version (see citations below). Our systematic reviews underpinned national policy advice and guidance related to MRSA screening, one of the main pillars of preventing the transmission of MRSA, and which has had a major impact in driving reductions of 50% in MRSA bloodstream infections across the NHS between 2005 and 2009 as evidenced in the Department of Health archive. Our systematic review of the significance of uniforms as a vector of HCAI, was incorporated into national policy related to healthcare worker uniforms in 2011.

In 2003 the Chief Medical Officer of England published 'Winning Ways', which used the evidence from Epic (2001 & 2003) to develop one of the seven areas for action to reduce HCAI, and in 2007 the guidelines were used to underpin the high impact interventions for the reduction in MRSA bloodstream infections. These high impact interventions formed the backbone of practice improvement strategies developed by the DH in England that resulted in an initial 50% reduction in meticillin resistant *Staphylococcus aureus* (MRSA) bloodstream infections between 2005 and 2009 with sustained reduction of infections by 80% to date. National Quality Improvement Audit Tools developed by the Infection Prevention Society and available electronically free to NHS trusts across the UK, are largely based on the evidence from Epic2.

The Epic guidelines were widely disseminated via a range of initiatives including a national programme of educational events in collaboration with the Infection Prevention Society, CR BARD (BARD Medical) and Ethicon (Johnston & Johnston Ltd), and national and international conference presentations. The guidelines now provide an evidence-base for clinical policies on the prevention and control of HCAI across NHS Trusts in the UK. In addition, a programme delivered by the researchers in collaboration with the Modernisation Agency from 2002-2003 applied improvement methodology with multidisciplinary teams from the NHS to develop projects to reduce HCAI.

This methodology was later applied between 2006-2009 as part of the DH programme to achieve a 50% reduction in MRSA bloodstream infections and a 30% reduction in *Clostridium difficile* infection. Epic guidelines also formed the basis for NHS e-learning programmes developed in 2007 by the researchers in collaboration with Intuition® and the Core Learning Unit (CLU) on infection control practice for clinical and non-clinical staff, and the prevention of device related infections. This won the Institute of IT training e-learning project of the year silver award 2007. The programme for non-clinical staff was subsequently updated in 2012 as part of the national Skills for Health programme.

In December 2009 the Chief Nursing Officer launched eight high impact actions, one of which was to reduce infections related to the use of indwelling urethral catheters. This action, together with the subsequent Harm Free Care - Safety Thermometer that has been adopted by most NHS Trusts in England, is based on evidence evaluated and synthesised in Epic2.

Hosted by the University of West London (then TVU), the establishment in 2006 of the Healthcare Associated Infection Research Network (HCAI RN), has delivered forward momentum in ensuring that patients and the public are involved in the prioritisation, development and conduct of research in the field of infection prevention and control. Since its inception in 2007 the Service User Research Forum (SURF) has ensured that researchers have access to members of the public interested in HCAI research with core training related to meaningful engagement with research groups, to meet the National Institute Health Research requirement that patient and public Involvement is a reality in publicly funded research. This is demonstrated by the inclusion of service users researchers as members of funded research teams and steering groups.

5. Sources to corroborate the impact

1 Gould, C.V., Umscheid, C.A., Agarwal, R.K., Kuntz, G., Pegues, D.A. & Healthcare Infection Control Practices Advisory Committee (2010) Guideline for Prevention of Catheter-Associated Urinary Tract Infections 2009. *Infect Control Hosp Epidemiol;* 31(4): 319-326.

2 NHMRC (2010) Australian Guidelines for the Prevention and Control of Infection in Healthcare. Commonwealth of Australia.

3 World Health Organization: WHO Patient Safety. *WHO guidelines on hand hygiene in health care*. World Health Organization. Geneva: 2009.

4 http://webarchive.nationalarchives.gov.uk/20120118164404/hcai.dh.gov.uk/files/2011/03/Document_MRSA_screening_FINAL_100907.pdf

5 Department of Health Uniforms and workwear: Guidance on uniform and workwear policies for NHS employers. London. Department of Health. 2010. p.16.

6 NHS Core Learning Unit Infection Prevention and Control Programmes for Clinical and non Clinical Staff http://www.corelearningunit.nhs.uk/

7 Quality Improvement Tools http://www.ips.uk.net/template1.aspx?PageID=84&cid=91&category=Quality-Improvement-Tool

8 Department of Health. (2008). *Clean, Safe Care – reducing infections and saving lives*. London: Department of Health. Department of Health. http://webarchive.nationalarchives.gov.uk/20120118164404/hcai.dh.gov.uk/whatdoido/high-impact-interventions/