THE NEW ZEALAND MEDICAL JOURNAL
Journal of the New Zealand Medical Association

Using economic data to reduce healthcare-acquired infection

Kate Halton, Nicholas Graves

In this issue Burns et al[1] report an estimate of the economic loss to Auckland City Hospital from cases of healthcare-associated bloodstream infection. They show that patients with infection stay longer in hospital and this must impose an opportunity cost because beds are blocked. Other costs fall on patients, their families and non-acute health services. Patients face some risk of dying from the infection.

Teasing out the independent effect of infection on outcomes is difficult. Those at high risk of infection often have independent higher risks of a longer stay and death, and infection can arise at *any* time during the admission. The method used by Burns et al was applied carefully and the authors should be commended for this; methods are however changing rapidly for this research area and other approaches are available.[2]

The chief message from this study—that those who hold the purse strings for health budgets should pay attention to—is that infections are costly and these costs can be reduced. There is an easy to understand economic paradigm. Additional money and resources might be diverted toward careful and vigilant infection control; in return costs and lives are saved.

Economic evidence is currently not a powerful influence on infection control decision-making. Use of explicit evidence, e.g. "spending X on infection control will give us Y in return and this is better that other uses of resources" is a sensible way to allocate infection control spending.[3] There might be problems acquiring rigorous and relevant cost-effectiveness evidence.[4] The argument can be time-consuming and complicated to make and results hard to interpret.[5] A distrust of the methods and assumptions used in economic evaluations is a deterrent to their use.[6,7] The quality of the infection control literature that exploits the economic paradigm has been poor[4,8] but is improving.

Rather than dwell on quality issues we discuss whether economic data are likely to be used by decision-makers. This is what matters to patients and their families currently disadvantaged by infection. And there is very little research on this topic.

Decision-makers might not have the time or motivation to find, read, understand and then act on cost-effectiveness data. Decision-makers under pressure to respond quickly to a problem may instead focus on simple evidence that is easy to understand and communicate to people e.g. "infections are expensive and so we must do something about it". But without cost-effectiveness information on how to reduce the problem resources could be wasted.

Solutions include closer collaboration between research and decision-making bodies to improve the relevance of evaluations, better communication of research findings, and the provision of health economics training to decision makers.[9] National guidelines that incorporate a cost-effectiveness perspective may also enhance uptake.

There are institutional barriers to using economic evidence. Authors of cost-effectiveness studies assume resources can be transferred easily from one budget to another. A control program might incur costs in the intensive care unit but the cost savings arise in the general medical ward. An intervention may be cost-effective but without appropriate compensation, funds may not be made available to implement it. Where all cost changes occur in one budget, such as a haemodialysis speciality, the lion's share of savings arise from released bed days. These represent a fixed cost to the hospital and few cash-savings will arise to fund the prevention programme. Infection prevention might only increase patient throughput—that is, improve production efficiency—rather than generate cash savings.

Political objectives might restrict the uptake of cost-effectiveness studies. Targets imposed externally, such as reducing rates of healthcare associated infection to zero may contradict the economic evidence, yet these targets may impel decision-making.[10] As infection rates fall residual infections become harder and more costly to prevent. There is no good evidence of whether zero is sustainable. Hospitals that attempt eradication may find as they approach zero the marginal investment required for infection control is not appropriately rewarded.[10] These initiatives currently dominate the infection control landscape and they might be a flag around which the infection prevention community rallies, rather than a realistic policy goal.

Cost-effectiveness is one factor for decision-makers.[6,7] Improving knowledge about its relative importance for decision-makers would be useful. Studies of national reimbursement and policy decisions in the UK and Australia have shown that greater importance was attached to levels of effectiveness and safety of interventions, the availability of alternatives, the seriousness and magnitude of the health issue and the perceived need in the community.[11,12]

At the healthcare provider level studies have shown that clinicians raise moral objections to rationing care.[13] A study of factors influencing physicians' decision to discharge patients with methicillin-resistant *Staphylococcus aureus* showed that severity of illness and the social support available for patients were prioritised over economic considerations such as targets to reduce length of stay.[14]

Infection control decision-making requires consideration of the economics of infection control not just the cost of infection. To support healthcare professionals in this endeavour we must increase our understanding of how they comprehend economic evidence, how they use this information and what barriers they face in integrating this evidence into their decision-making process. This will improve the impact of economic evidence on clinical decision-making. Research should be done about this.

Competing interests: None.

Author information: Kate Halton, Project Officer, The Centre for Healthcare Related Infection Surveillance and Prevention, Brisbane, Queensland, Australia; Nicholas Graves, Professor of Health Economics, School of Public Health and Institute of Health and Biomedical Innovation, Queensland University of Technology, Kelvin Grove, Queensland, Australia

Correspondence: Professor Nicholas Graves, School of Public Health and Institute of Health and Biomedical Innovation, Queensland University of Technology, 60 Musk Avenue, Kelvin Grove Urban Village, Kelvin Grove, Queensland, 4059, Australia. Fax: +61 (0)7 31386030; email: n.graves@qut.edu.au

References:

1. Burns A, Bowers L, Pak N, Wignall J, Roberts S. The excess cost associated with healthcare-associated bloodstream infections at Auckland City Hospital. N Z Med J 2010;123(1324). http://www.nzma.org.nz/journal/123-1324/4392
2. Barnett A, Batra R, Graves N, et al. Using a longitudinal model to estimate the effect of methicillin-resistant Staphlyococcus aureus infection on length of stay in an intensive care unit. American Journal of Epidemiology 2009; 170:1186–94.
3. Graves N, Halton KA, Lairson D. Economics and preventing hospital-acquired infection – broadening the perspective. Infection Control and Hospital Epidemiology 2007;28:178–184.
4. Halton KA, Graves N. Economic evaluation and catheter-related bloodstream infections. Emerging Infectious Diseases 2007;13:815–823.
5. Halton KA, Cook DA, Whitby M, et al. Cost effectiveness of antimicrobial catheters in the intensive care unit: addressing uncertainty in the decision. Crit Care 2009;13:R35.
6. van Velden ME, Severens JL, Novak A. Economic evaluations of healthcare programmes and decision making. Pharmacoeconomics 2005;23:1075–1082.
7. Eddama O, Coast J. A systematic review of the use of economic evaluation in local decision-making. Health Policy 2008;86:129–141.
8. Stone PW, Braccia D, Larson E. Systematic review of economic analyses of health care-associated infections. American Journal of Infection Control 2005;33:501–509.
9. Galni C, Rutten FFH. Self-reported healthcare decision-makers' attitudes towards economic evaluations of medical technologies. Current Medical Research and Opinion 2008;24:3049–3058.
10. Graves N, McGowan E, Jr. Nosocomial infection, the Deficit Reduction Act, and incentives for hospitals. JAMA 2008;300:1577–1579.
11. Devlin N, Parkin D. Does NICE have a cost-effectiveness threshold and what other factors influence its decisions? A binary choice analysis. Health Economics 2004;13:437–452.
12. George B, Harris A, Mitchell A. Cost-effectiveness analysis and the consistency of decision making: evidence from pharmaceutical reimbursement in Australia (1991 to 1996). Pharmacoeconomics 2001;19:1103–1109.
13. Ubel PA, Jepson C, Baron J, et al. The influence of cost-effectiveness information on physicians' cancer screening recommendations. Social Science and Medicine 2003;56:1727–1736.
14. Yaldo AZ, Sullivan JL, Li Z. Factors influencing physicians' decision to discharge hospitalized patients infected with methicillin-resistant Staphylococcus aureus. American Journal of Health-System Pharmacy 2001;58:1756–1759.