Culture and team dynamics in antimicrobial prescribing behaviours

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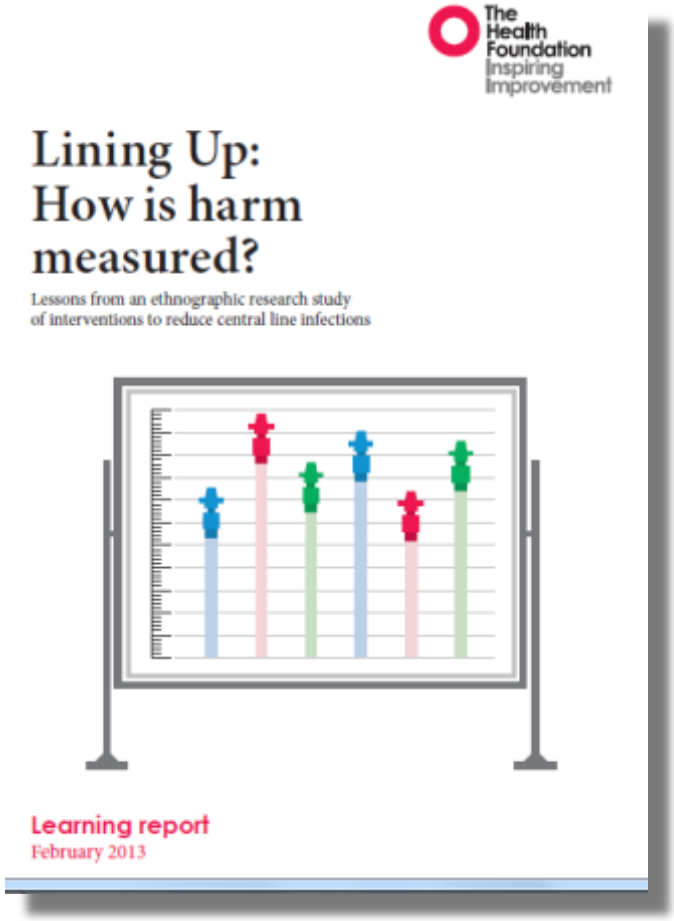
Research in antimicrobial stewardship

Gaps in research in antimicrobial stewardship

Mindlines vs Guidelines Gabbay et al BMJ 2004 Oct 30; 329(7473): 1013

- Clinicians rarely used explicit guidelines
- Internalised tacit guidelines
- Socially constructed knowledge
- Mindlines aka culture?

Measurement is a Social Process



MAJOR ARTICLE

Behavior Change Strategies to Influence Antimicrobial Prescribing in Acute Care: A Systematic Review

Esmita Charani,[1] Rachel Edwards,[1] Nick Sevdalis,[2] Banos Alexandrou,[3] Eleanor Sibley,[4] David Mullett,[4] Bryony Dean Franklin,[5,6] and Alison Holmes[1]

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Background. Antimicrobial use in acute care is widely reported to be suboptimal. Inappropriate use of antimicrobials is a major contributing factor to the emergence of multidrug resistance and health care–associated infection. Addressing prescribing behavior is a key component of antimicrobial stewardship.

Methods. We performed a novel systematic review of both qualitative and quantitative literature on antimicrobial prescribing behavior in acute care. We assessed the extent to which behavioral sciences and social marketing were used and whether this could be related to the effectiveness of reported outcomes. MEDLINE, Excerpta Medica Database (EMBASE), Applied Social Sciences Index and Abstracts (ASSIA), Business Source Complete, The Cochrane Library, PsychInfo, Database of Abstracts of Reviews of Effectiveness (DARE) and Health Management Information Consortium (HMIC) were searched for studies undertaken during the period January 1999–April 2011 and published in English.

Results. Five qualitative and 5 quantitative studies met the quality criteria. Qualitative studies highlight the predominant influence of social norms, attitudes, and beliefs on antimicrobial prescribing behavior. Quantitative studies reporting interventions to optimize antimicrobial prescribing behavior do not use theoretical science or primary research to inform the design and choice of the interventions deployed.

Conclusions. Despite qualitative evidence demonstrating the impact of behavioral determinants and social norms on prescribing, these influences are not given due consideration in the design and evaluation of interventions. To ensure a better understanding of prescribing behaviors and to improve the quality of interventions and research in this area, the incorporation and application of behavioral sciences supported by appropriate multidisciplinary collaboration is recommended.

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Overarching Quality Criteria

(i) clearly stated aims and objectives (ii) complete outcome data (iii) data collection appropriate and addresses research aims (iv) analysis sufficiently rigorous and free of bias (v) conclusions clear and justified, limitations addressed (vi) free of other risk of bias (e.g. threats to internal/external validity, researcher bias (viii) ethical issues addressed

Study Specific Quality Criteria

RCTS and CRTCs Cochrane risk of bias tool[21]	Controlled quasi experimental EPOC[22] Criteria for CBAs Adequate:	ITS EPOC[22] criteria	Quasi experimental Revised EPOC Criteria	Qualitative CASP[19,20] Tool
Sequence generation; Allocation concealment; Blinding	Baseline measurement; Explanation of choice of intervention and control group; Protection against selection bias	Protection against contamination; Protection against secular change; Rational number of pre/post intervention measurements; Rational explanation of shape of intervention effect	Baseline measurement; Justification for sample choice; Explanation of the likely effects of the lack of control on outcomes; Attempt to mitigate against effect of no control on outcomes	Appropriateness of qualitative methodology; Adequate sampling

THE LANCET Infectious Diseases

Review

Optimisation of infection prevention and control in acute health care by use of behaviour change: a systematic review

Rachel Edwards, Esmita Charani, Nick Sevdalis, Banos Alexandrou, Eleanor Sibley, David Mullett, Heather P Loveday, Lydia N Drumright, Alison Holmes

Changes in the behaviour of health-care workers (HCWs) are required to improve adherence to infection prevention and control (IPC) guidelines. Despite heavy investment in strategies to change behaviour, effectiveness has not been adequately assessed. We did a systematic review to assess the effectiveness and sustainability of interventions to change IPC behaviour and assessed exploratory literature for barriers to and facilitators of behaviour change. 21 studies published from 1999 to 2011 met our inclusion criteria: seven intervention studies and 14 exploratory studies. Of the intervention studies none explicitly incorporated psychological theory and only two contained elements of social marketing in the design, although five addressed sustainability. All elicited behaviour change, reduction in infection risk, or both. The exploratory studies identified social and cultural factors that affect the IPC behaviour of HCWs. To improve the standard of research and broaden the evidence base, we recommend that quality criteria are added to existing systematic review guidelines to enable the inclusion of qualitative research and to ensure robust design, implementation, and reporting of interventions.

Published Online
February 17, 2012
DOI:10.1016/S1473-3099(11)70283-3

National Centre for Infection Prevention and Management, Department of Medicine (R Edwards MSc, E Charani MPharm, L N Drumright PhD, Prof A Holmes MD) and Department of Surgery and Cancer and Imperial Centre for Patient Safety and Service Quality (N Sevdalis PhD), Imperial College London, London, UK; 106 Palmerston Road, London, UK (B Alexandrou MSc); Dr Foster Intelligence, London, UK (E Sibley MPhil, D Mullett MA); and Richard Wells Research

Introduction

Health-care-associated infection (HAIs) and increased resistance to antimicrobials have put infection prevention and control (IPC) at the forefront of initiatives to improve quality of care. Since 2007, the incidence of meticillin-resistant *Staphylococcus aureus* (MRSA) bloodstream

interventions in a theoretical framework that is supported by exploratory research is well recognised.[10] Additionally, theoretical frameworks from psychology, social marketing, or other social sciences that address the issues of how to change behaviour and sustain such changes over time, remain underused.

THE LANCET Infectious Diseases

Recommendation	Descriptor
Conduct primary research	Engage in multidisciplinary primary research. Include expertise from social and behavioral sciences [41] to identify the key behavioral determinants of antimicrobial prescribing in the target audience in whom a change in behavior is desired.
Tailor interventions	Use data from primary research to identify key behavioral determinants and tailor interventions to (1) address identified barriers and (2) enhance the facilitators of the desired behavior change.
Evaluate intervention outcomes	Evaluate the effectiveness of interventions to bring about prescribing behavior change.
Address sustainability	Monitor the long-term adoption and implementation of the intervention and recognize the importance of building sustainability into the intervention model.

MAJOR ARTICLE

Understanding the Determinants of Antimicrobial Prescribing Within Hospitals: The Role of "Prescribing Etiquette"

E. Charani,[1] E. Castro-Sanchez,[1] N. Sevdalis,[2,3] Y. Kyratsis,[1] L. Drumright,[1] N. Shah,[1] and A. Holmes[1]

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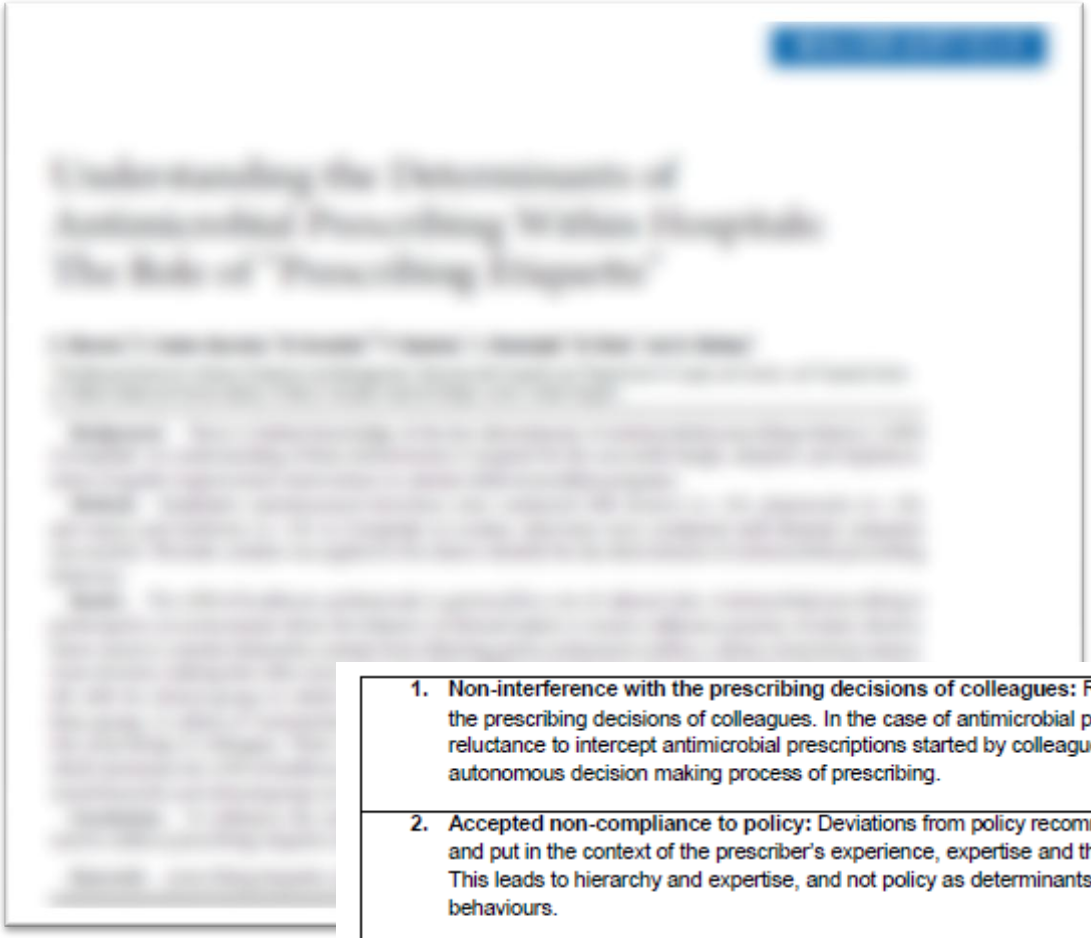
Background. There is limited knowledge of the key determinants of antimicrobial prescribing behavior (APB) in hospitals. An understanding of these determinants is required for the successful design, adoption, and implementation of quality improvement interventions in antimicrobial stewardship programs.

Methods. Qualitative semistructured interviews were conducted with doctors (n = 10), pharmacists (n = 10), and nurses and midwives (n = 19) in 4 hospitals in London. Interviews were conducted until thematic saturation was reached. Thematic analysis was applied to the data to identify the key determinants of antimicrobial prescribing behaviors.

Results. The APB of healthcare professionals is governed by a set of cultural rules. Antimicrobial prescribing is performed in an environment where the behavior of clinical leaders or seniors influences practice of junior doctors. Senior doctors consider themselves exempt from following policy and practice within a culture of perceived autonomous decision making that relies more on personal knowledge and experience than formal policy. Prescribers identify with the clinical groups in which they work and adjust their APB according to the prevailing practice within these groups. A culture of "noninterference" in the antimicrobial prescribing practice of peers prevents intervention into prescribing of colleagues. These sets of cultural rules demonstrate the existence of a "prescribing etiquette," which dominates the APB of healthcare professionals. Prescribing etiquette creates an environment in which professional hierarchy and clinical groups act as key determinants of APB.

Conclusions. To influence the antimicrobial prescribing of individual healthcare professionals, interventions need to address prescribing etiquette and use clinical leadership within existing clinical groups to influence practice.

Keywords. prescribing etiquette; antimicrobial prescribing; prescribing behavior.



1.	**Non-interference with the prescribing decisions of colleagues:** Reluctance to interfere with the prescribing decisions of colleagues. In the case of antimicrobial prescribing there is a reluctance to intercept antimicrobial prescriptions started by colleagues. This recognises the autonomous decision making process of prescribing.
2.	**Accepted non-compliance to policy:** Deviations from policy recommendations are tolerated and put in the context of the prescriber's experience, expertise and the specific clinical scenario. This leads to hierarchy and expertise, and not policy as determinants of prescribing practice behaviours.
3.	**Hierarchy of prescribing:** Prescribing as an activity is performed by junior doctors. But it is the senior doctors who decide what is prescribed.

Etiquette

Peers

opinion leaders

patients

Culture

Hierarchy

experience

Autonomy

Skodvin et al. Antimicrobial Resistance and Infection Control (2015) 4:24
DOI 10.1186/s13756-015-0065-4

ANTIMICROBIAL RESISTANCE & INFECTION CONTROL

RESEARCH Open Access

An antimicrobial stewardship program initiative: a qualitative study on prescribing practices among hospital doctors

Brita Skodvin[1*], Karina Aase[2], Esmita Charani[3], Alison Holmes[3] and Ingrid Smith[1]

International Journal of Antimicrobial Agents xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

International Journal of Antimicrobial Agents

journal homepage: http://www.elsevier.com/locate/ijantimicag

Review

Time for action—Improving the design and reporting of behaviour change interventions for antimicrobial stewardship in hospitals: Early findings from a systematic review

Peter Davey[a,*], Claire Peden[a], Esmita Charani[b], Charis Marwick[a], Susan Michie[c]

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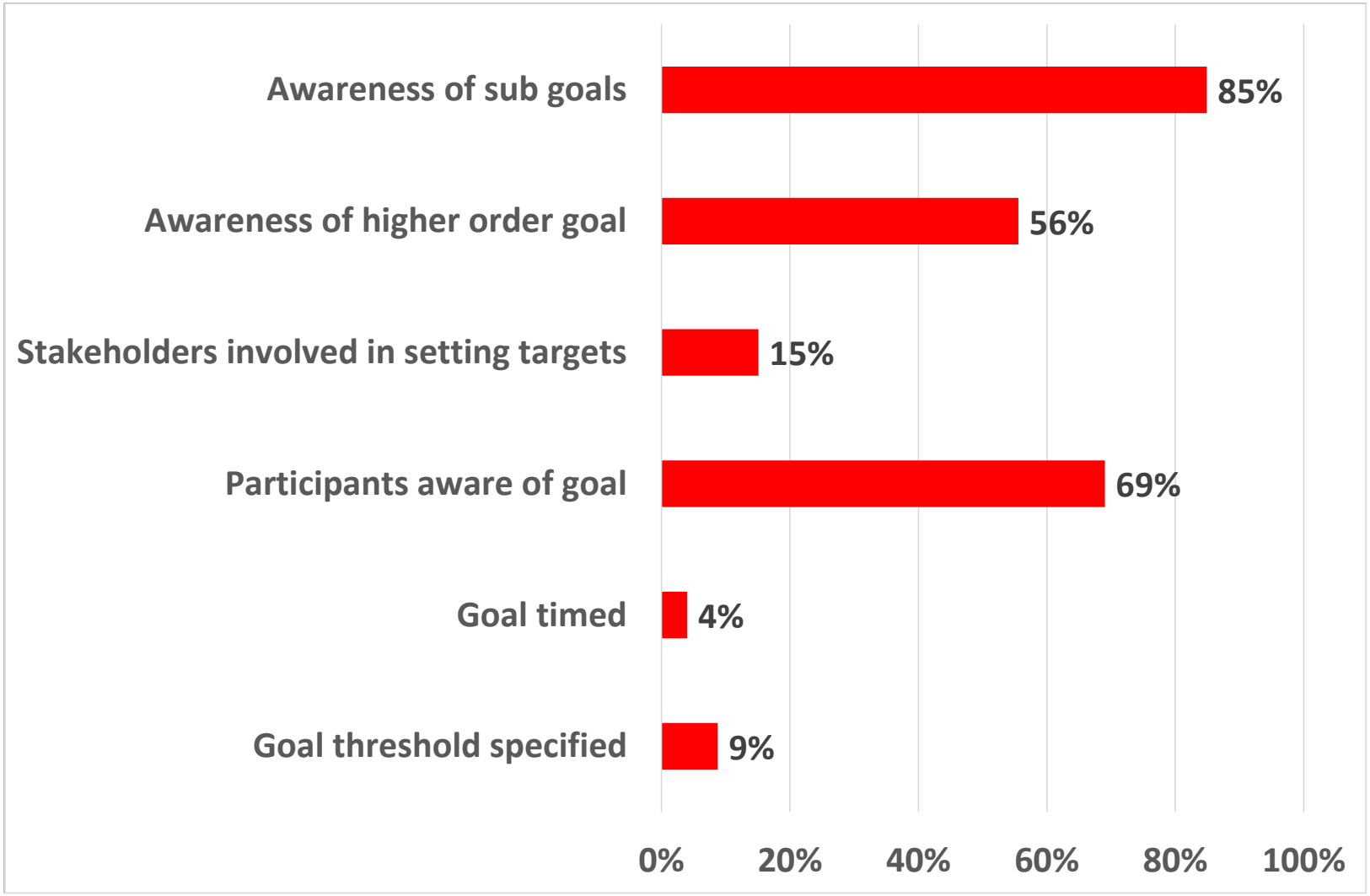
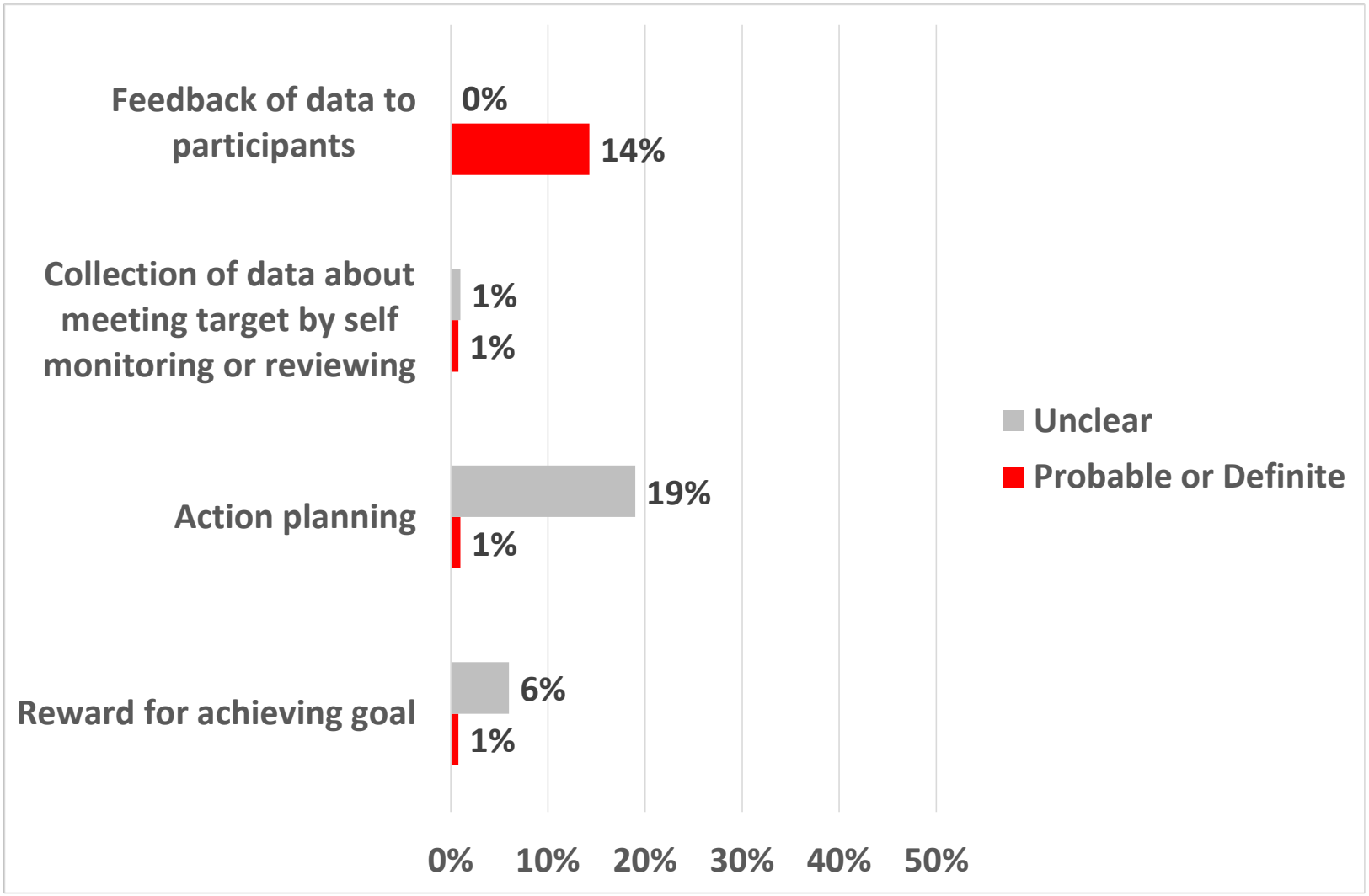
Action plan


Awareness of sub goals
85%
Awareness of higher order goal
56%
Stakeholders involved in setting targets
15%
Participants aware of goal
69%
Goal timed
4%
Goal threshold specified
9%
0%
20%
40%
60%
80%
100%

Feedback and Action Planning



Junior doctor involvement in AMS – only one example from Canada in self-stewardship…

Annals of Internal Medicine | SUPPLEMENT

Antibiotic Self-stewardship: Trainee-Led Structured Antibiotic Time-outs to Improve Antimicrobial Use

Todd C. Lee, MD, MPH; Charles Frenette, MD; Dev Jayaraman, MD, MPH; Laurence Green, MD; and Louise Pilote, MD, MPH, PhD*

Background: Antibiotic use is an important quality improvement target. Nearly 50% of antibiotic use is unnecessary or inappropriate. To combat overuse, the Centers for Disease Control and Prevention (CDC) proposed "time-outs" to reevaluate antibiotics.

Objective: To optimize antibiotic use through trainee-led time-outs.

Design: Before–after study.

Setting: Internal medicine (2 units, 46 beds) at a university hospital.

Patients: Inpatients ($n = 679$).

Intervention: From January 2012 until June 2013, while receiving monthly education on antimicrobial stewardship, resident physicians adjusted patients' antibiotic therapy through twice-weekly time-out audits using a structured electronic checklist.

Measurements: Antibiotic costs were standardized and compared in the year before and after the audits. Use was measured as World Health Organization defined daily doses (DDDs) per 1000 patient-days. Total antibiotic use and the use of moxifloxacin, carbapenems, antipseudomonal penicillins, and vancomycin were compared by using interrupted time series. Rates of nosocomial *Clostridium difficile* infection were compared by using incidence rate ratios.

Results: Total costs in the units decreased from $149 743 CAD (January 2011 to January 2012) to $80 319 (January 2012 to January 2013), for a savings of $69 424 (46% reduction). Of the savings, $54 150 (78%) was related to carbapenems and $15 274 (22%) was due to other antibiotic classes. Adherence with the auditing process was 80%. In the time-series analyses, the only reliable and statistically significant change was a reduction in the rate of moxifloxacin use, by −1.9 DDDs per 1000 patient-days per month (95% CI, −3.8 to −0.02; $P = 0.048$). Rates of *C. difficile* infection decreased from 24.2 to 19.6 per 10 000 patient-days (incidence rate ratio, 0.8 [CI, 0.5 to 1.3]).

Limitation: Other temporal factors may confound the findings.

Conclusions: An antibiotic self-stewardship bundle to implement the CDC's suggested time-outs seems to have reduced overall costs and targeted antibiotic use.

Primary Funding Source: None.

Ann Intern Med. 2014;161:S63-S68. doi:10.7326/M13-3016 www.annals.org

For author affiliations, see end of text.

* Former Robert Wood Johnson Foundation Clinical Scholar.

Journal of Antimicrobial Chemotherapy Advance Access published October 23, 2015

J Antimicrob Chemother
doi:10.1093/jac/dkv337

Journal of Antimicrobial Chemotherapy

Antimicrobial stewardship: are we failing in cross-specialty clinical engagement?

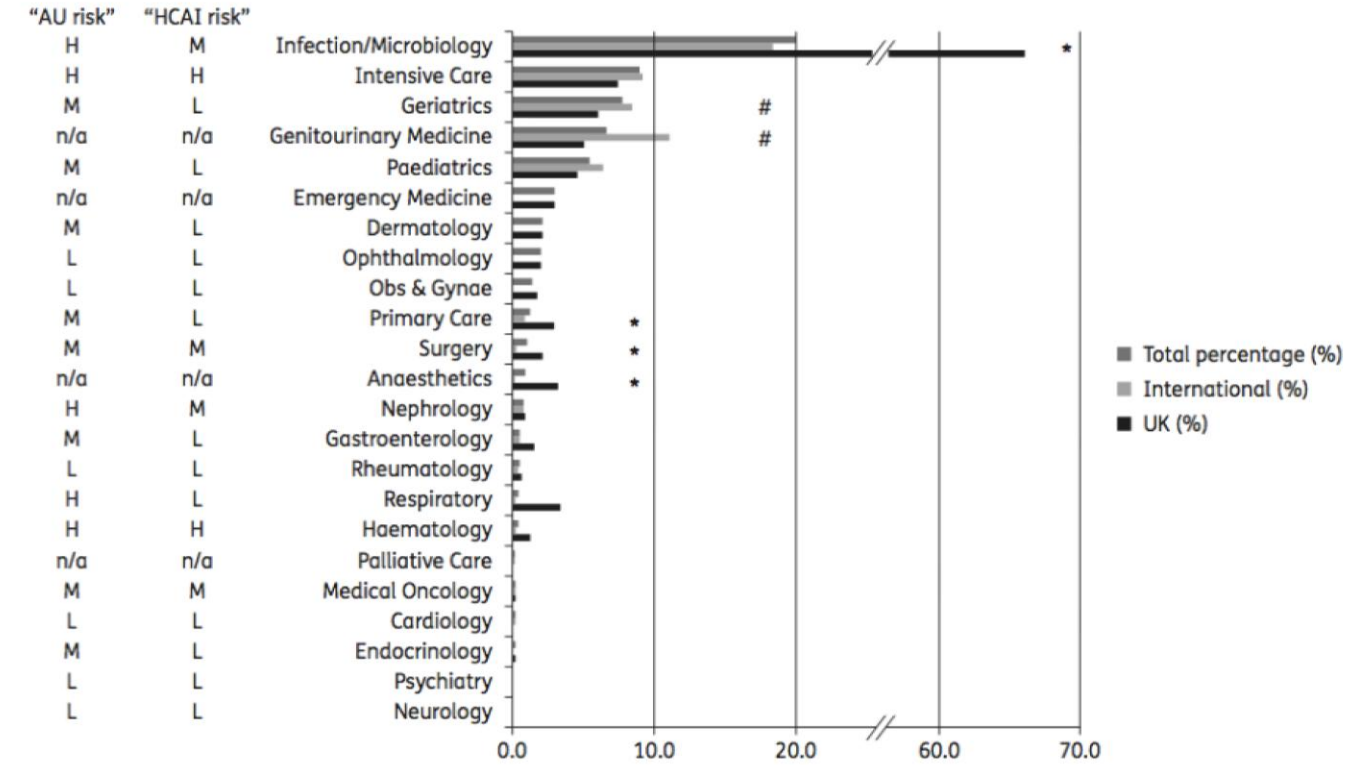


Figure 3. AMS- and/or AMR-related abstracts from UK and international state-of-the-art clinical scientific conferences in 2014. *UK significantly greater than international conferences ($P<0.05$). #International significantly greater than UK conferences ($P<0.05$). Risk score: H=high, M=medium and L=low (calculated from the ECDC pilot point-prevalence survey of HCAI and AU data[12]). n/a, not available.

NHS
National Institute for Health Research

NIHR HPRU one of four main research themes

- Innovations in Behaviour Change, Technology and Patient Safety to Improve Infection Prevention and Antimicrobial Use
- Across the healthcare economy
- Use of qualitative research methods
- Ethnography
- International perspective
- Implementation research

https://www.futurelearn.com/courses/antimicrobial-stewardship

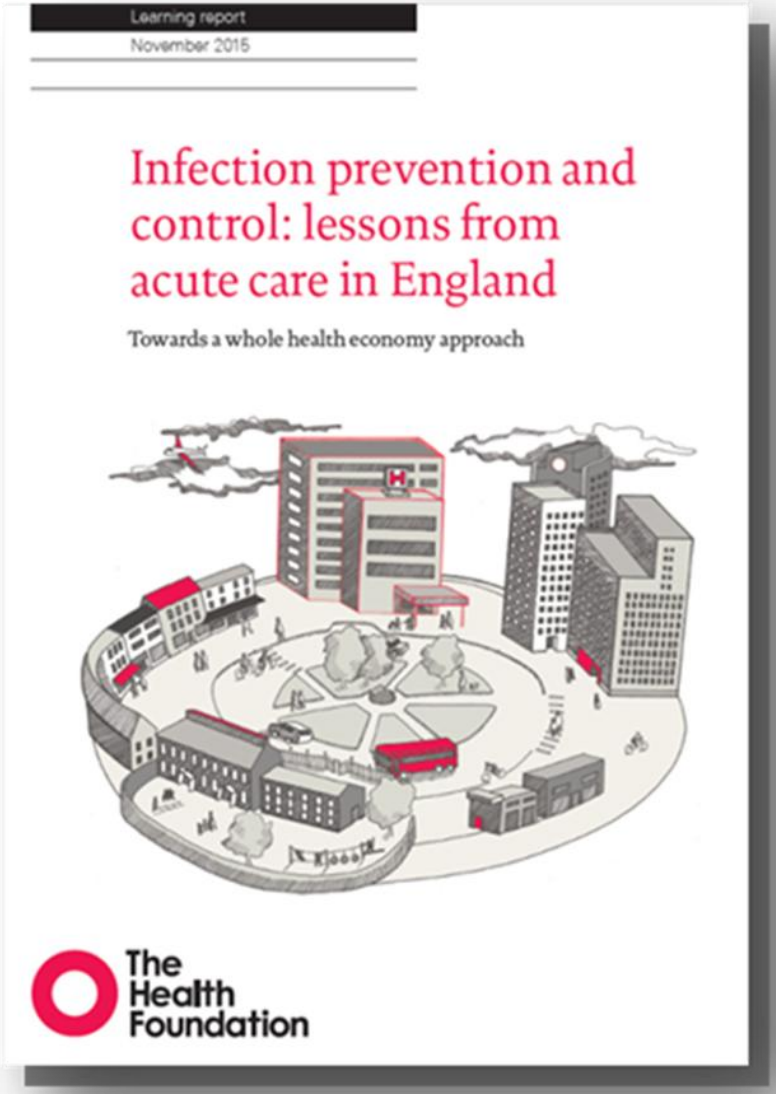
Ongoing research – International perspective

- MOOC – taking the research to an international audience
  - Over 5000 learners worldwide
  - Week 5: dedicated week to behaviour change
    - 920 learners
    - 445 completed survey on (55% of learners)
    - Favourite week was week five!
    - Recognition of need to integrate behaviour change research
  - FCO project with BSAC – AMS in India

Outcomes/recommendations

- Culture is important globally
- UK still unique in it's MDT setting
- Lessons on how to flatten hierarchies
- Identify the key champions
- Influencing practice in different settings

Health Foundation becoming involved in improving antimicrobial prescribing behaviours



IPC recommendations:

- Identifying ‘champions’
- Positive organisational culture
- Active feedback
- Multimodal strategies

Planned analysis of impact, implementation & cost-effectiveness of interventions such as local AMR action plans

Front line IPC behaviours must be actively supported and positively reinforced by a hospital environment whilst minimising risk

Take home message

- Culture and context matter
- Having an action plan and goals not enough if you don’t share them
- Local champions – not seagull management!
- Communication
- Sharing information
- Team dynamics and priorities

Imperial HPRU in AMR and HCAI, in collaboration with the Health Foundation and BSAC

Thank you! I leave you with some of the comments from the MOOC learners…

'Culture must never be underestimated.'

'It is interesting that although culture plays such an important part in AMS we don't focus efforts on changing it as much as we should. Hierarchy can be a huge barrier to implementing change.'

'You are absolutely correct, Culture plays significant role in antibiotics prescription…even here in our society in South Sudan community prefer injectables more than oral and the reason behind this move is in unknown. I agree with you.'

Acknowledgements

NIHR Health Protection Research Unit
Healthcare Associated Infection
and Antimicrobial Resistance

Alison Holmes
Luke Moore
Enrique Castro-Sanchez

Imperial College Healthcare NHS
NHS Trust

Mark Gilchrist
Darren Nelson
Eimear Brannigan

NHS
National Institute for Health Research

HELSE BERGEN
Haukeland universitetssjukehus

Stig Harthug
Ingrid Smith
Brita Skodvin

Peter Davey
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