

Imperial College
London

Challenges in implementing innovations in antibiotic prescribing

Esmita Charani
Research and Academic Pharmacist





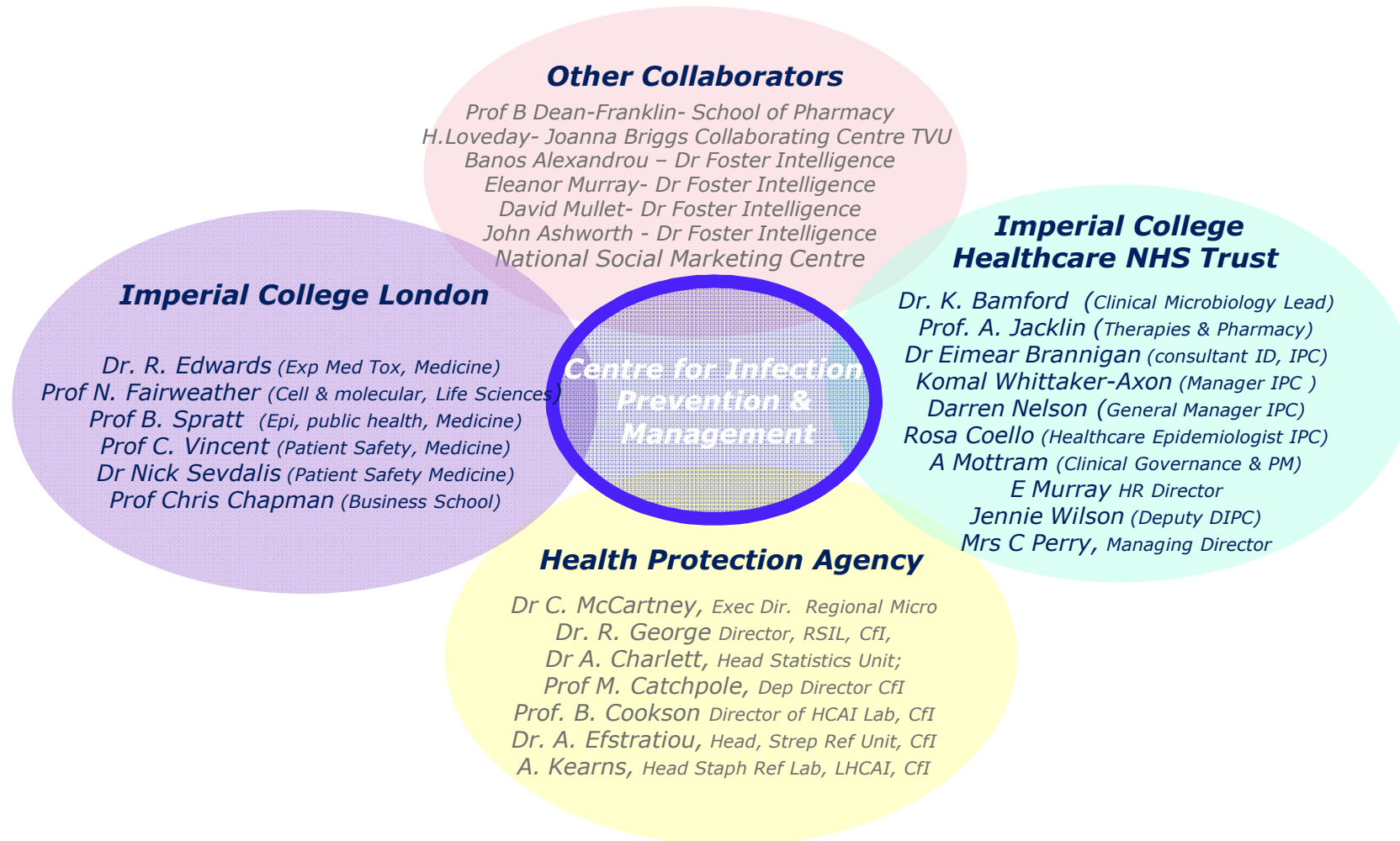
- Aim is to tackle healthcare acquired infection and antibiotic prescribing in a multifaceted and multidisciplinary way**

- Funded by the UKCRC - £5.7M over 5 years**

- 14 new posts**

- 7 Studentships**

CIPM Collaborators



CIPM Work Streams

Work stream 1 Embedding Infection
Prevention within NHS Organisations

Work stream 2 Clinical infection and
Pathogenesis

Work stream 3 Infection Surveillance

Work stream 4 Capacity Building

Mind the gap!



‘One of the most consistent findings in health care service research is the gap between best practice (as determined by scientific evidence) on the one hand and actual clinical care on the other.’ Grol et al

Patterns of behaviour in healthcare

- 30-40% of patients do not receive care according to current scientific evidence Grol *et al*
- 1/3 of patients in acute care receive antibiotics Thomas *et al*, Nathwani *et al*
- Significant proportion of antibiotic prescribing in acute setting is sub-optimal Behar, *et al*, House of Lords Select Committee
- Hand hygiene compliance rarely exceeds 40% WHO
- Staff adherence to best practice needs to be improved NAO

The antibiotic era

Important innovations in infection management:

Antibiotics

Diagnostics

Healthcare Technologies

Hygiene and Infection Control

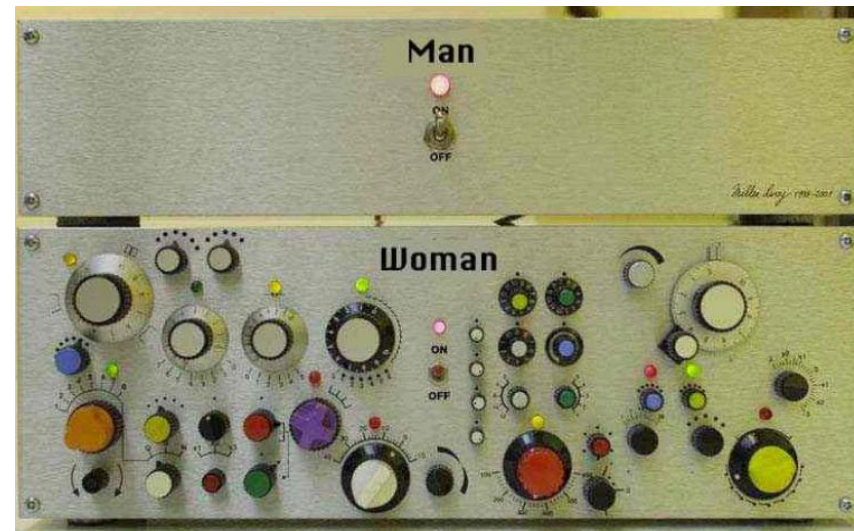
Microbiological Surveillance

International collaboration

The end of the line for infections?

Antibiotic prescribing is complex!

- A social process
- Under influence of many determinants
- Selective toxicity
- Collateral damage
 - Resistance
 - HCAI
 - Not tangible at prescriber/patient level
- Expertise required
 - Universally used
- Prescribing etiquette
- A diminishing resource



Antibiotic stewardship

What is Antibiotic Stewardship? Dellit et al

- A marriage of infection control and antibiotic management
- Mandatory infection control compliance
- Selection of antibiotics from each class of drugs that does the least collateral damage
- Collateral damage issues include: MRSA , ESBLs , *C.difficile* , VRE
- Appropriate de-escalation when culture results are available

Aims of antibiotic stewardship

Delitt et al. *Clin Inf Dis.* 2007; 44:159-177

- Optimise clinical outcomes
- Minimise unintended consequences
 - Toxicity
 - Emergence of resistance
 - Selection of pathogenic organisms e.g. *Clostridium difficile*
- Essential part of patient safety
- Infection control and antibiotic stewardship have been shown to help contain antibiotic resistance

Producing guidelines is only the first step

- ❑ Guidelines and policy developed to help decision making
- ❑ These provide knowledge and awareness

BUT

They may not shift attitudes and change practice

- ❑ The goal should be to make prudent prescribing the default and routine practice
- ❑ Do we need to investigate habitual behaviour as a first step to changing it?
 - ❑ Self efficacy, heuristics, biases
- ❑ Only part of a wider choice architecture

Antibiotic guidelines as a behaviour change intervention

- Antibiotic guidelines want prescribers to...
 - Start or adopt new behaviours
 - Stop doing something damaging
 - Prevent adoption of negative/harmful behaviour
 - Change or modify existing behaviours
- Factors affecting behaviour are:**
 - Personal
 - Social
 - Environmental

To successfully change behaviours we need to...

- Understand the cultural and contextual influences that shape HCW behaviours in acute care settings
- Understand how these behaviours impact on Infection Prevention and Control (IP&C) and prudent antibiotic prescribing outcomes
- Develop multimodal behaviour change interventions that will consider barriers and facilitators to behaviour change
- Evaluate behaviour change interventions and their impact on infection outcomes

Implementation research

- Considers influences on HCW behaviour
- Identifies methods to enable HCW to use research findings more effectively
- A need to establish theoretical basis of interventions
- Undertake exploratory studies to choose and refine interventions
- At present no theory/modelling phase
- Limited understanding of characteristics of targeted behaviour

Using innovation to improve practice

Better use of teams. Teamwork rather than individual interventions, reliant on; leadership, adaptability, mutual performance monitoring and support

Baker

Addressing mobilising evidence into practice in organisations

Pronovost et al

Developing systems that address human factors and reliability (decision aids, desired action is the default, habits and patterns used in design, process clearly specified, takes advantage of pathways)

Resar, Pronovost et al

Whole-system approach to optimising practice Charani et al

- Towards sustainable and effective adherence to best practice
- Promote a multidisciplinary culture of shared knowledge
- Develop an environment of choice where desired practice is the default option
 - Availability of policy and guideline at point of prescribing
 - Drug chart design
 - Multidisciplinary approach
 - Supported by education
- Involvement in the decision making process
- Widespread diffusion of practice

How to embed behaviour change

- Identify behaviours
 - What? Who? How?
- Understand influences by audience
 - Primary research
 - Segment
 - Behavioural insight
- Develop a practical model to influence behaviour
 - Use insights to develop a practical, multidisciplinary model
- Build a marketing framework
 - To communicate the desired change
- Can we learn from the marketing sector?

Evidence from scientific literature

- Evidence from a systematic review Charani et al
 - No evidence of utilisation of behavioural sciences
 - Interventions not evaluated
 - Qualitative literature highlights behavioural determinants of prescribing practice
- Need a different approach to interventions?
- Work with healthcare professionals to improve the choice environment
 - Help them to underpin the principles of optimised practice
 - Environment of shared knowledge

Innovations in infection – the technology gap

- All but 2 classes of antibiotics discovered over 40 years ago
 - Erosion of therapeutic effectiveness^{Finch}
 - Need new agents
 - Lack of return on investment
- Diagnostics
 - Need rapid reliable near-patient diagnostic tests
- Better surveillance of resistance and linking it to outcomes
- Need for new healthcare technologies

- Innovative ways to looking at improving adherence
- Addressing the entire choice environment
- Assessing the needs of individual healthcare professionals
- Whole system approach to optimising antibiotic use
- Need to improve the theoretical basis of interventions
- Consider behavioural determinants in relation to HCAI and antibiotic prescribing
- Need to address the technology gap

References

- ❑ Schuster M, McGlynn E, Brook RH: How good is the quality of health care in the United States? *Milbank Q* 1998, 76:517-563.
- ❑ Grol R: Successes and failures in the implementation of evidence-based guidelines for clinical practice. *Med Care* 2001, 39:II-46-II-54.
- ❑ Sirur R, Richardson J, Wishart L and Hanna S. The role of increasing adherence to prescribed practice. *Physiother Can* 2009; 61:68-77.
- ❑ Hulscher M, Grol R and van der Meer J. Antibiotic prescribing in hospitals: a social and behavioural scientific approach. *Lancet* 2010;10: 167-175.
- ❑ Kunin CM, Tupasi T, Craig WA. Use of antibiotics. A brief exposition of the problem and some tentative solutions. *Ann Intern Med* 1973; 79: 555-60.
- ❑ Charani E, Cooke J and Holmes A. Antibiotic Stewardship Programmes . what's missing? *J Antimicrob Chemother*; 65: 2275-2277.

Acknowledgements

- ❑ National Institute for Health Research (NIHR) Biomedical Research Centre Funding Scheme at Imperial College
- ❑ National Centre for Infection Prevention and Management (CIPM) funded by the UKCRC

Thank you

‘People only support what they create’

Margaret Wheatley