Chapter 1 **Introduction**

1.1 The story of this book

Let me start with a warning: this book is not going to give you a cookbook answer to the question of how to implement evidence-based healthcare (EBHC). My (more modest) aim is threefold:

1. To introduce you to different ways of thinking about the evidence, people, organisations, technologies and so on (read the chapter headings) that are relevant to the challenge of implementing EBHC.
2. To persuade you that implementing EBHC is not an exact science and can never be undertaken in a formulaic, algorithmic way. Rather – and notwithstanding all the things that are known to help or hinder the process – it will always require contextual judgement, rules of thumb, instinct and perhaps a lucky alignment of circumstances.
3. To promote interest in the social sciences (e.g. sociology, social psychology, anthropology) and humanities (e.g. philosophy, literature/storytelling, design) as the intellectual basis for many of the approaches described in this book.

This book was a long time in gestation. The idea first came to Anna Donald and me in the late 1990s. At the time, we were both working in roles that involved helping people and organisations implement evidence – and it was proving a lot harder than the textbooks of the time implied. That was the decade in which evidence-based medicine (EBM), which later expanded beyond the exclusive realm of doctors to EBHC (to include the activities of other health professionals, managers and lay people), was depicted as a straightforward sequence of asking a clinical question, searching the literature for relevant research articles, critically appraising those articles and implementing the findings. The last task in the sequence was depicted as something that could be ticked off from a checklist.

Anna and I penned an outline for the book (it looked very different then – because most of the research into knowledge translation and implementation cited here had not yet been done). But, tragically, Anna became ill before we got much further and died a few years later, with our magnum opus barely started. Whilst the detail of what is described here is my own work, there is still a sense in which it is Anna's work too. Even in those early days, before terms like 'implementation science', 'research utilisation', 'knowledge translation' and 'evidence-into-action' became part of our vocabulary, Anna recognised that we would never be able to produce a set of evidence implementation checklists in the same way as she and I once drew up a set of critical appraisal checklists for our students.

It has taken me nearly 20 years to produce this book, partly because when Anna died, I lost a dear friend as well as a formidable intellectual sparring partner – but also because the question 'How do you implement EBHC?' is a good deal too broad for a single book. And yet, *one* book to scope the field and run a narrative through its many dimensions was exactly what was needed. I have long been convinced that whilst there are definite advantages to asking dozens of different authors, each with different views on the subject, to cover different aspects of this complex and contested field (Sharon Straus and her team did just that, and the book they edited is worth reading [1]), the EBHC community (nay, network of communities) also needs a single-author textbook whose goal is to achieve some degree of coherence across the disparate topics.

EBM and EBHC have come a long way since the 1990s. The 'campaign for real EBM', which I helped establish in 2014, has called for a broadening of EBM's parameters to include the use of social science methodologies to study the nuances of clinical practice, policymaking and the patient experience – as well as considering the political dimension of conflicts of interest in research funding and industry sponsorship of trials [2]. It is, perhaps, a reflection of the broadening of the EBM/EBHC agenda that implementation science has been established as a separate interdisciplinary field of inquiry (with much internal contestation), with its own suite of journals, research funding panels and conference circuit [3].

One important development in EBHC in recent years is the growing emphasis on value for money in the research process and an emerging evidence base on how little impact research so often has on practice and policy. This overlaps with the expectation on universities (in the United Kingdom at least, via the Research Excellence Framework) to demonstrate that the research they undertake has impact beyond publishing papers in journals read only by other academics. I have reviewed the literature on research impact elsewhere [4].

In 2014, Sir Iain Chalmers led a series in the *Lancet* that highlighted different aspects of research waste, including waste in the allocation of research funds (too often, we study questions people don't want answered and fail to study the ones they do) [5]; waste in the conduct of research (studies are underpowered, use the wrong primary endpoints and/or the wrong measurements and so on) [6]; and waste when the findings of research prove 'unusable' in practice (because the findings are not presented in ways that could be applied by practitioners or policymakers) [7]. Most recently, John Ioannidis has written a masterly review on 'Why Most Clinical Research Is Not Useful' [8]. I look at this last paper in detail in Section 9.1. The bottom line is clear: there is a huge gap between evidence and its implementation – and it's not easily explained.

The final impetus for me finishing this book was taking up a new job at the University of Oxford in 2015. My new job description included leading (along with Kamal Mahtani) the module 'Knowledge Into Action'. This was part of the popular and well-regarded MSc in Evidence-Based Health Care run by Carl Heneghan and his team from the Centre for Evidence-Based Medicine. The students on the Knowledge Into Action course were asking for a textbook. Some (the less experienced ones) were looking for checklists and formulae – but many who had worked at the interface between evidence and practice for years knew that the field was not predictable enough to be solved by such things. These more enlightened students wanted a way to get their heads round *why* implementing EBHC is not an exact science.

In sum, this book looks two ways. Looking retrospectively, it is dedicated to the memory of Anna Donald, who helped inspire it. And looking prospectively, it is dedicated to those who study the implementation of EBHC with a view to improving outcomes for patients. It also seeks to make a contribution to increasing value and reducing waste in research by increasing the proportion of good research that has a worthwhile impact on patients (the sick) and on citizens (including those of us who pay taxes and who may become sick).

1.2 There is no tooth fairy …

This section started life as a blog on the website of the Centre for Evidence Based Health Care at the University of Oxford. I wrote it to set the scene for the Knowledge Into Action MSc module that Kamal Mahtani and I were running in 2016. Our group of students had already completed modules on critical appraisal, randomised controlled trials and other highly rigorous methodological approaches. They perhaps anticipated that 'rigorous

methodology' would get them through the implementation stage too. To get my excuses in before the course began, I penned this blog entry:

Tools and resources for critical appraisal of research evidence are widely available and extremely useful. Whatever the topic and whatever the study design used to research it, there is probably a checklist to guide you step by step through assessing its validity and relevance.

The implementation challenge is different. Let me break this news to you gently: there is no tooth fairy. Nor is there any formal framework or model or checklist of things to do (or questions to ask) that will take you systematically through everything you need to do to 'implement' a particular piece of evidence in a particular setting.

There are certainly tools available [see Appendices], and you should try to become familiar with them. They will prompt you to adapt your evidence to suit a local context, identify local 'barriers' and 'facilitators' to knowledge use, select and tailor your interventions, and monitor and evaluate your progress. All these aspects of implementation are indeed important.

But here's the rub: despite their value, knowledge-to-action tools cannot be applied mechanistically in the same way as the CONSORT checklist [2] can be applied to a paper describing a randomised controlled trial. This is not because the tools are in some way flawed (in which case, the solution would be to refine the tools, just as people have refined the CONSORT checklist over the years). It is because implementation is infinitely more complex (and hence unpredictable) than a research study in which confounding variables have been (or should have been) controlled or corrected for.

*Implementing research evidence is not just a matter of following procedural steps. You will probably relate to that statement if you've ever tried it, just as you may know as a parent that raising a child is not just a matter of reading and applying the child-rearing manual, or as a tennis player that winning a match cannot be achieved merely by knowing the rules of tennis and studying detailed statistics on your opponent's performance in previous games. All these are examples of **complex practices** that require skill and situational judgement (which comes from experience) as well as evidence on 'what works'.*

*So-called 'implementation science' is, in reality, not a science at all – nor is it an art. It is a **science-informed practice**. And just as with child-rearing and tennis-playing, you get better at it by doing two things in addition to learning about 'what works': doing it, and sharing stories about doing it with others who are also doing it. By reflecting carefully on your own practice and by discussing real case examples shared by others,*

*you will acquire not just the abstract knowledge about 'what works' but also the practical wisdom that will help you make contextual judgements about **what is likely to work** (or at least, what might be tried out to see if it works) in **this situation** for **these people** in **this organisation** with **these constraints**.*

There is a philosophical point here. Much healthcare research is oriented to producing statistical generalisations based on one population sample to predict what will happen in a comparable sample. In such cases, there is usually a single correct interpretation of the findings. In contrast, implementation science is at least partly about using unique case examples as a window to wider truths through the enrichment of understanding (what philosophers of science call 'naturalistic generalisation'). In such cases, multiple interpretations of a case are possible and there may be no such thing as the 'correct' answer (recall the example of raising a child above).

In the Knowledge Into Action module, some of the time will be spent on learning about conceptual tools such as the Knowledge to Action Framework [see Appendix A]. But the module is deliberately designed to expose students to detailed case examples that offer multiple different interpretations. We anticipate that at least as much learning will occur as students not only apply 'tools' but also bring their rich and varied life experience (as healthcare professionals, policymakers, managers and service users) to bear on the case studies presented by their fellow students and visiting speakers. Students will also have an opportunity to explore different interpretations of their chosen case in a written assignment.

I hope this blog entry has conveyed the inherent complexity and uncertainty of the field I will be exploring in this book. If you are interested in attending the Knowledge Into Action course, google 'Oxford MSc in Evidence Based Health Care' and find it on the list of modules. The residential week usually runs in late spring, when Oxford is at its glorious best – but be warned: the course usually books up several months in advance.

1.3 Outline of this book

As you can see from the list of chapter titles, each chapter looks at a different level of analysis. Separating the world out into different levels is a useful analytic technique but is in danger of introducing an artificial sense of order. Any attempt to implement EBHC in real life will require you to consider the material from more than one chapter (and ideally all the chapters) in combination.

Chapter 2 looks at evidence. It begins by problematising the very word 'evidence' and encourages you to question the provenance, completeness, relevance and ways of interpreting a piece of evidence – even when it is a randomised controlled trial or systematic review that appears to tick all the right methodological boxes. It also explains the term 'knowledge translation' and reminds you that different users of evidence (researchers, policymakers, practitioners, managers, patients, citizens) come from different cultural 'worlds' and have different values and expectations. It also considers the attributes of evidence (a guideline, for example) that tend to promote its adoption in practice. I offer some tips for generating the kind of evidence that potential users are likely to find useful.

Chapter 3 is about people – all people, since it covers the discipline of psychology, but mainly clinicians, since it relates to the adoption and non-adoption of evidence-based guidelines. I offer a highly eclectic selection of theories of human behaviour, notably 'fast' and 'slow' thinking and the science of heuristics (Kahneman, Gigerenzer); the theory of planned behaviour (Ajzen and Fishbein) and critiques thereof; learning domains of knowledge, skills and attitudes (Bloom); adult learning theory (Kolb, Knowles); social learning theory and self-efficacy (Bandura); and dynamic or staged theories (e.g. Prochaska and DiClemente's stages of change, Rogers' stages of adoption). I also summarise some reviews and empirical studies of why clinicians do not always follow evidence-based guidelines, including work by Michael Cabana, Susan Michie and Richard Grol. I consider empirical evidence from interventions intended to change clinician behaviour – including interventions that prompt, reward or feed back on behaviour; interventions that seek to improve knowledge; interventions that promote the use of heuristics; interventions that promote adult (on-the-job) learning; interventions that promote social influence; and interventions aimed at influencing the stages of change. In a final section, I offer some tips for those who seek to change clinicians' behaviour.

Chapter 4 is about groups and teams. It emphasises the team-based nature of much clinical care these days, and presents evidence on what makes a group or team effective (and, by implication, what may make one ineffective). I contrast different models of leadership – including hierarchical, democratic and distributed; and I suggest, provocatively perhaps, that there are 'male' and 'female' leadership styles (although the former can be adopted by women and the latter by men). I emphasise the importance of facilitation, and introduce organisational learning theory (Argyris and Schön). I give some examples of empirical studies of leadership and facilitation. By way of a summary, I offer tips for leading and facilitating your team to implement best evidence.

Chapter 5 considers organisations. Most of the chapter summarises a systematic review my team published in 2004–05 on the diffusion of innovations in healthcare organisations, which has been widely cited and used.

I introduce various components of our diffusion of innovations model in turn, including structural features of the organisation, its propensity to take up new knowledge (*absorptive capacity*) and the presence or not of a *receptive context for change* (including things like organisational culture and climate); the organisation's readiness to adopt a particular innovation (including innovation-system fit); the process of assimilation (i.e. the organisation's initial efforts to take up the innovation); how the innovation is implemented within the organisation; the external ('outer') context, including the behaviour of other organisations in the same sector; and the dynamic linkage between all these elements. The chapter also includes the findings from a later update to our original diffusion of innovations review, covering the routinisation and sustainability of complex service-level innovations. I suggest some tips for promoting organisational innovativeness.

Chapter 6 looks at citizens – that is, lay people who are not currently patients. This chapter is about the involvement of citizens in the research process: why it is a good idea to involve them (and why it will help the implementation of best practice); how to avoid tokenism; how to 'co-create' research with citizens and communities; and how to communicate the findings of research to a lay audience. I summarise with some tips on how to improve patient and public involvement in your own research.

Chapter 7 is about patients – that is, all of us when we are sick or in need of care, or believe ourselves to be so. I take a hard look at whether the EBHC community is (or ever has been) 'biased' against patients – in the sense that it has (with the best of intentions) served a researcher or clinician agenda at the expense of the needs of the sick patient. I look at the evidence on implementing evidence with patients in the clinical encounter ('shared decision-making'), drawing heavily on the work of Glyn Elwyn. I also look at the literature on self-management of chronic illness and consider two framings of such management ('biomedical' and 'lifeworld'). I look at patient involvement in service improvement efforts. I then offer some tips for improving evidence-based patient care.

Chapter 8 addresses technology. It begins by trying to bust the myth of technological determinism (i.e. by explaining why technologies do not, in and of themselves, *cause* change). It looks at the expanding industry of medical apps (downloadable pieces of software intended to help the clinician and/or the patient implement evidence in clinical care). Acknowledging that a high proportion of technology projects in healthcare fail, I spend a lot of time discussing the non-adoption and abandonment of technologies by both patients and clinicians. I finish with some tips for using technologies to implement evidence.

Chapter 9 is about policy. I take issue with the research tradition of identifying barriers and facilitators to the use of research evidence in policy, arguing that we first need to understand what policymaking *is*. I describe some

theories of how policymaking actually happens (I like to define it as the struggle over ideas). I introduce Carol Weiss's taxonomy of how evidence is used in this struggle – including the instrumental and tactical use of evidence in the rhetorical game of influencing significant stakeholders. Much of this game is about the use of language and 'social drama'. I introduce the terms 'value based healthcare' (Sir Muir Gray) and 'values based healthcare, (Mike Kelly and colleagues), and propose that facts and values are not (as is some-times assumed in the EBHC world) separate and separable. Rather, the 'facts' of EBHC are irredeemably value-laden. I end with some tips for getting closer alignment between research and policy.

In Chapter 10, I talk about networks. Networks are important because knowledge is more social and more fluid than we often assume. Knowledge (both explicit and tacit) is generated, negotiated, refined and circulated in networks of various kinds. Specifically, I consider social networks and social influence (beginning with Coleman et al.'s classic 1964 study of how Pfizer discovered the power of social influence in drug prescribing); professional communities of practice (and the concept of clinical 'mindlines' developed by John Gabbay and Andrée Le May); and patient communities (especially online support groups for chronic illness). I give some tips for improving networks and networking.

Chapter 11 is about systems. It introduces the concept of complex adaptive systems (which Paul Plsek and I wrote about in a *BMJ* series some years ago). Complex systems are unpredictable and emergent, so they do not lend them-selves well to rational planning and rigid milestones. Rather, they need an emergent approach in which there is careful collection of, and response to, emerging data. In this chapter, I also cover realist evaluation and review actor-networks and multi-stakeholder health research systems. My final tips are for working effectively with complex systems.

With practical applications in mind, Appendix A provides an overview of frameworks, tools and techniques, including driver diagrams, process mapping, stakeholder mapping, plan–do–study–act cycles and many more. Appendix B details many (although not all) of the different psychological theories of behaviour change.

One final introductory point: this book is not a comprehensive overview of every aspect of implementing EBHC (any more than a manual on child-rearing could possibly cover every challenge a parent might face). Different authors would have put different things in – and left different things out – from the topics I selected. The ones I cover in this book are the ones I personally think are important and the ones I feel confident to cover. I write it as an introduction to a complex, interdisciplinary and rapidly expanding field of inquiry on which there is (thankfully) no firm consensus. If you want

to go beyond one person's perspective on this field, I recommend that you explore beyond the topics covered in this book. A good place to start might be the journal *Implementation Science* (www.implementationscience. biomedcentral.com), which is freely available online, or two key books *Knowledge Translation in Health Care*, edited by Sharon Straus and colleagues [1] and *Improving Patient Care: The implementation of Change in Healthcare* [9].

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