Introduction

The field of healthcare has undergone, and will continue to undergo, rapid change. Recent events have shown the importance of sharing and understanding data and the need to respond quickly to events. In a hyperconnected world in which a virus can spread throughout the continents in weeks, we no longer need to wait months for print journals to deliver important research findings. Fortunately, we have, in the form of the internet, a tool that enables knowledge to travel around the world at an even faster pace than even the most contagious virus. Quicker and wider access to information, alongside greater transparency in research conduct, should lead to a golden age of evidence-based practice.

However, this information must be managed. The internet is a double-edged sword, as false or dubious claims spread quickly and threaten to undermine the good work of clinicians and researchers, misleading the public and possibly practitioners too. Furthermore, when making decisions that can quite literally be a matter of life or death, it is important that those making these decisions do so using the best available knowledge and also that as knowledge changes so does policy. Acting on partial or poorly understood information can have devastating effects on communities and individuals. When considering a problem, there is always the temptation to use a search engine and read only the first study that comes up; this would not only be lazy, but risky.

The World Health Organization declared the coronavirus (Covid-19) to be a pandemic on 12 March 2020. There was a need for much new research into the control and treatment of Covid-19; but there was also a need to have a good understanding about what was already known. Wasting valuable time and resources on replicating existing knowledge is not acceptable in any circumstances, least of all in this situation. Already by 6 April 2020, one of the main control measures, that of school closures, was critically examined in a rapid systematic review of school closures and other school social distancing practices across the world [1]. Such a review is far more useful to policy-makers and the public than looking at original studies, many of which will be behind paywalls and so inaccessible to most people and who also may not understand the methodological and statistical details of the papers.
even if they did have the time and inclination to read them all. This is the role of the systematic review.

One example of what can go wrong, with devastating consequences, was with the measles, mumps, and rubella (MMR) vaccine. One ill-judged case series that suggested a link between the MMR vaccine and autism, subsequently retracted [2], was the basis for a rumour that reduced public confidence in the vaccine to such an extent that many parents refused to have their children vaccinated. As a result of this, we saw epidemics of diseases in places where they were thought well controlled. Had people been able to look not just at the one study but the entire body of literature the lack of evidence for this association, this might have been avoided. Actually, the work of the reviewer entails looking critically at the literature, in this case recognising the inherent weaknesses of the case series as a form of evidence and other clues perhaps to the veracity of any claims [3]. In pointing this out, we are not saying that the case series is a flawed methodology, just that it can never show cause and effect. To see the correct use of a case series like this, we might look at a paper in the American Morbidity and Mortality Weekly Report from 1981, which reported the cases of five apparently healthy young men with Pneumocystis pneumonia. This was interesting because this condition is very unusual, and to see so many cases in apparently healthy people was unknown. We now know that they were the first reported cases of acquired immune deficiency syndrome (AIDS). However, starting the findings, the conclusion though is appropriately measured: ‘All the above observations suggest the possibility of a cellular-immune dysfunction related to a common exposure that predisposes individuals to opportunistic infections such as pneumocystosis and candidiasis’ [4].

Because they use the entire body of literature, systematic reviews are widely regarded as the highest form of evidence by the scientific community. Rigour and replication are the bedrocks of science. In this regard, review methodologies have undergone enormous change in recent years, indeed during the period over which this book has written new tools and techniques have become available. The days of a systematic review being comprised of a few papers you have hanging around plus a quick search are long gone! As we emphasise throughout this book, a review should produce a whole greater than the sum of parts. Whether the reviewed studies are quantitative or qualitative, the output is more than a summary; a distinct contribution to knowledge is made by interpreting the weight and meaning of evidence.

The above requirements mean that writing a systematic review requires a team that usually encompasses subject experts, at least one person who is knowledgeable about literature search strategies, systematic review methodologists, someone experienced in the methods used to analyse the data and a team to write the review. Our own contributions to the systematic review literature have encompassed mental health [5, 6], infection control [7] and child health [8, 9].

It is important to stress that systematic reviews cannot be conducted on every topic, and in some areas, it is more difficult than others. It relies on the question being amenable to research; not all are. It relies on literature being available. It also relies on a sensitivity to and understanding of the difficulties of the primary
researchers. Research can be a long, frustrating and lonely business; reviewers should always remember this when reviewing the work of others.

For budding systematic reviewers, we hope that this book will inform and inspire you. We also hope that it helps experienced reviewers and academic supervisors to reconsider some of their assumptions. We are all learning all of the time, and this book is certainly not the last word, but we are confident that our guidance will keep you on the right track, heading in the right direction.

1.1 How to Read This Book

Although a systematic review has distinct parts, they only really make sense as a whole; one part informs the next. We suggest that you read each chapter as you go along. Each chapter can be used individually, but it may require some flicking back and forth between chapters. We have indicated in the text where this may be needed.

All of the references are in a Zotero Group; you can access this here: https://www.zotero.org/groups/2460528/systematicreviewbook/items/APGI5B9K/library.

Acknowledgements We would like to acknowledge all of those who have helped through education and experience in our development as nurses and scholars. In particular, Edward would like to thank Jeannine who has put up with so much and the staff and students at King’s College London and more recently City, University of London, alongside whom he has polished his reviewing skills. Niall would like to thank Catherine and the girls and all those who have supported him through thick and thin.

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