



***El papel de bibliotecarios y especialistas de la información en una forestería basada en la evidencia***

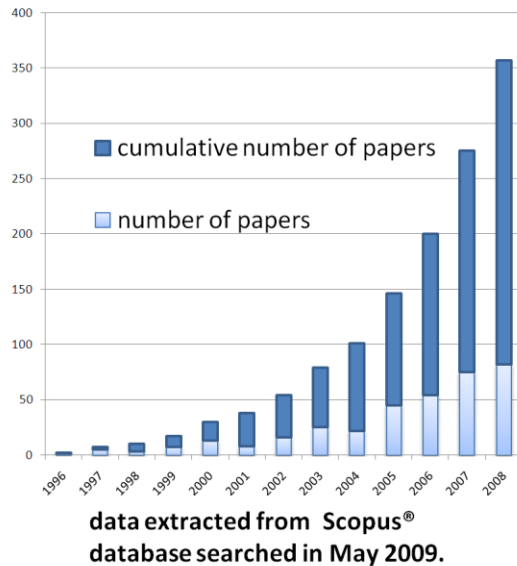
**The role of librarians and information specialists in evidence-based forestry**

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## Growth of concept 'evidence-based'

- We talk about it
- We publish papers about it
- What is it?

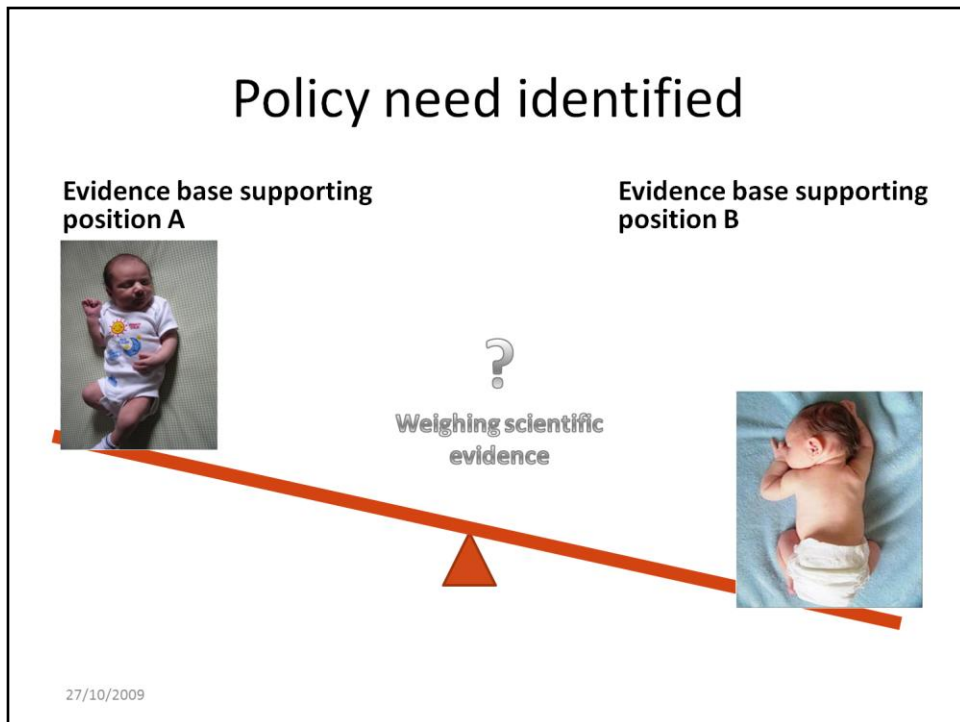


### The historical background to evidence-based decision making

The term 'evidence based medicine' was coined in the 1980s to label a clinical learning strategy, which the medical school at McMaster University, Canada had been developing for over a decade (Rosenberg & Donald, 1995). This strategy involved four steps:

- formulate a clear clinical question from a patient's problem;
- search the literature for relevant clinical articles;
- evaluate (critically appraise) the evidence for its validity and usefulness;
- implement useful findings in clinical practice.

This 'new paradigm for medical practice' stressed the importance of examining evidence from research to guide decision-making in practice. Among the new skills they insisted were necessary for practitioners was the ability to conduct efficient literature searches and the application of formal rules of evidence evaluation of the clinical literature (Evidence-Based Medicine Working Group, 1992). Critical appraisal skills were acknowledged to have critical importance. Since its adoption by medicine, the concept of evidence-based frameworks for decision-making has grown dramatically and spread to fields other than medicine. Figure 1 illustrates the growth in the number of published environmental papers since 1996 which include the phrase 'evidence-based' in the title, abstract or keywords of the paper. The data were extracted from the Scopus® database which was searched in May 2009.



*What is it? Why did the medics invent evidence-based medicine? A story illustrates: In a sense we are all lucky to be sitting in this room. We are all survivors of a policy which was not grounded in science. The inspiration for my research came from a man I met some years ago who told me that he'd been responsible for the deaths of more babies than he cared to count. As a young doctor, he had followed the advice of the eminent paediatrician, Dr. Benjamin Spock, whose advice was to lay babies to sleep on their stomachs.*

- Spock thought there was a danger of choking if the baby vomits while asleep on his back. This advice was published in 'Baby and Child Care' by Dr Benjamin Spock - 1956 & 1958 versions of his book. It became a highly influential book, bought by millions around the world and was thus hugely influential not only to parents, but also to those writing advisory books on child care for some decades afterwards.

- From 1954 until 1988, a substantial proportion of texts consistently favoured front sleeping. Many authors repeated the arguments put forward by Spock, but apart from one text in 1990, the back position was not consistently advocated until 1995. Policy was therefore actively to encourage parents to put babies to sleep on their fronts from the mid 1950's up until 1995 when the link between sleeping on the front and Sudden Infant Death Syndrome (SIDS) was firmly established.

*Not a very surprising thing you might say, either in science or in medicine; science advances, new discoveries are made and policies change to reflect these new findings. However, a systematic review of the science was undertaken in 2005 by Ruth Gilbert and her team, who did establish the strong link between prone sleeping and SIDS.*

- **"Infant sleeping position and the sudden infant death syndrome: systematic review of observational studies and historical review of recommendations from 1940 to 2002"** Ruth Gilbert et al. *International Journal of Epidemiology* 2005;**34**:874–887

# Policy need identified

Evidence base supporting position A



Evidence base supporting position B



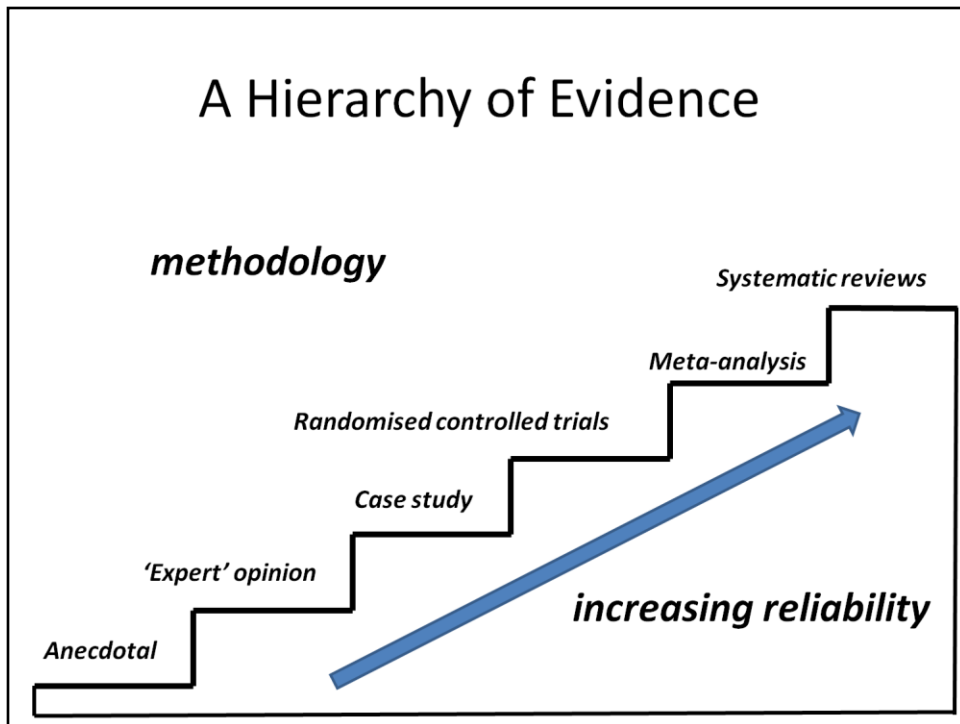
“your teachers have tried to give you a good opportunity to learn and to offer you information which the evidence indicated to be accurate. Nevertheless, probably half of what you know is no longer true. This troubles me, but what troubles me more is that I don't know which half it is.” (Pickering, 1956)



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*However, they also discovered that:*

- Advice to put infants to sleep on the front for nearly half a century was contrary to evidence available from 1970 that this was likely to be harmful. Systematic review of preventable risk factors for SIDS from 1970 would have led to earlier recognition of the risks of sleeping on the front and might have prevented over 10 000 infant deaths in the UK and at least 50 000 in Europe, the USA and Australasia.
- The science had been available; it had not found its way out of the domain of researchers into practitioners who were therefore advocating a very flawed policy.
- The policy was based on ‘expert’ opinion – who better as an expert on paediatrics than Spock? – And the experts had not looked at the **whole** evidence.



The medics in attempting to find ways of reducing bias and improving the quality of evidence have come up with a hierarchy of evidence, which can be conceptualised as a stairway leading to higher levels of scientific reliability. Of course, there is much debate about the validity of this type of classification and it is important to stress that the best expert opinion could be more valuable than the worst meta-analysis. But how do we judge expertise rationally? Systematic reviews, if done badly, can be redone. In fact MUST be redone. One of the underpinning requirements for a Cochrane-style systematic review is that it must be updated from time to time. A good definitions is:

*“[Systematic review](#) is a tool used to summarise, appraise and communicate the results and implications of a large quantity of research and information. It is particularly valuable as it can be used to synthesise results of many separate studies examining the same question, which may have conflicting findings.*

*The purpose of a [systematic review](#) is to provide the best available evidence on the likely outcomes of various actions and, if the evidence is unavailable, to highlight areas where further original research is required. It is, therefore, a tool to support decision-making by providing independent, unbiased and objective assessment of evidence; it is not designed to make decisions on behalf of the user-community”*

They have been described as ‘critical links in the great chain of evidence’ which are not satisfied with finding part of the truth, but look for ‘the whole truth’ (Mulrow, 1994).

## Systematic reviews debunk policy myths

- ***Education***



- In her address at the opening of the Nordic Campbell Center, Copenhagen, Merete Konnerup, the Director, gave examples showing how the road to hell can be paved with the best of intentions.
- First, an analysis of more than 50 studies has suggested that effective reading instruction requires phonics: promotion of the whole language approach by educational theorists during the 1970s and 1980s seems likely to have compromised children's learning.

## Systematic reviews debunk policy myths

- ***Road accidents***



- Second, a systematic review of controlled assessments of driver education programmes now being promulgated in British schools fails to provide any support for the theory that these programmes will reduce the number of crashes involving teenagers; indeed, because the programmes prompt young people to start driving at an earlier age, they may well increase the number of such crashes.

- These were examples of policies introduced by 'experts' on the basis of 'belief' rather than scientific evidence. The perceived benefits of the interventions/policies were myths, easily debunked by a close examination of the evidence.

## Do we need evidence-based forestry?



There is a need to ensure that both primary research and applied research in practice and policy is based on the firmest scientific foundation which has systematically collated, assessed and analysed the available research. While medicine and social policy have adopted robust methods for synthesizing research in multi-disciplinary, international groups, this is not happening on anything like the scale which it could be in forestry.

## Do we need evidence-based forestry?



There are very few systematic reviews which have been undertaken, though there is an innovative project to undertake a systematic review on methods of carbon assessment and measurement under the UN REDD programme being led by FAO (<http://www.environmentalevidence.org/SR77.html>) and plans to develop a European network of information nodes to support evidence-based forestry led by the UK's Forestry Commission and University of Oxford.

Systematic reviews are widely recognized as powerful tools for making sense of the enormous volume of published and unpublished literature. Their role in reducing the bias inherent in reviews or primary studies is well documented.

# Do we need evidence-based forestry?



## Systematic reviews reduce bias compared with standard ‘narrative’ reviews

Feature	Systematic review	Narrative review
1. Review question	<i>Often a focused question</i>	Often broad in scope
2. Sources of articles to review & search strategy	<i>Comprehensive sources and explicit search strategy</i>	Not usually specified, <i>potentially biased</i>
3. Selection of articles to review	<i>Criterion-based selection, uniformly applied</i>	Not usually specified, <i>potentially biased</i>
4. Appraisal	<i>Rigorous critical appraisal</i>	Variable
5. Synthesis	<i>Quantitative summary (may be meta-analysis if there is statistical synthesis)</i>	Often a qualitative summary
6. Inferences	<i>Usually evidence-based</i>	Sometimes evidence-based

## Do we need evidence-based forestry?



It is clear that much decision-making and policy in forestry is not based on the best science which has been systematically collected and analysed. Peer review is not the same as systematic review. We owe it to future generations to get forestry policy right. We have excellent scientists and a huge body of existing knowledge available to us. Let us systematically review it according to our policy needs.

## Why systematic reviews in forestry?

### The problem:

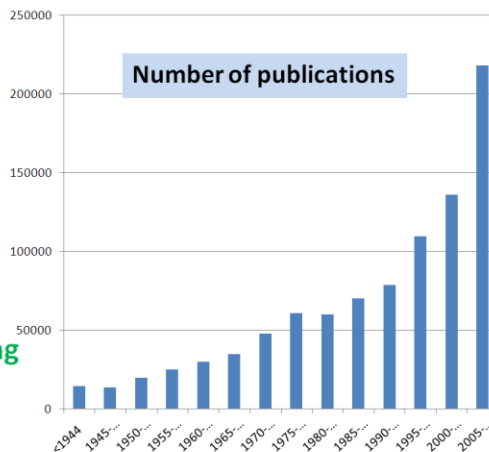
#### Information access and overload

- Exponential growth in forestry information
- Tightening subscription budgets

### The solution:

#### Sharing and consolidating

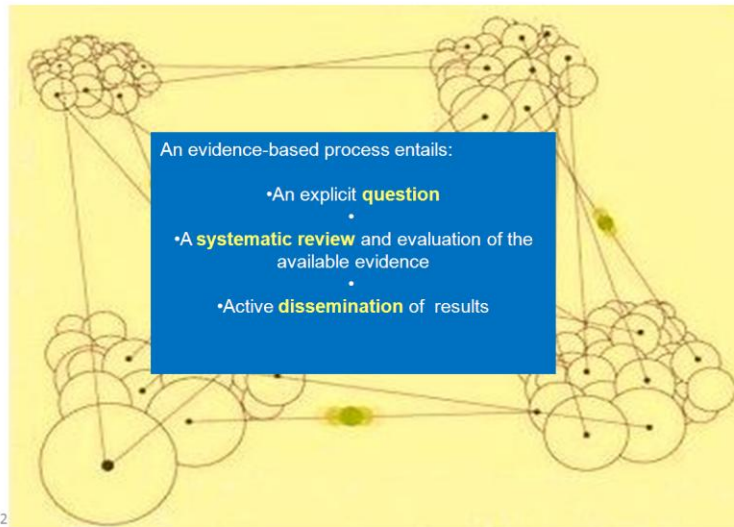
- Reliable synthesised information
- Greater networking



Data extracted from the ForestScience database (CABI) September 2009

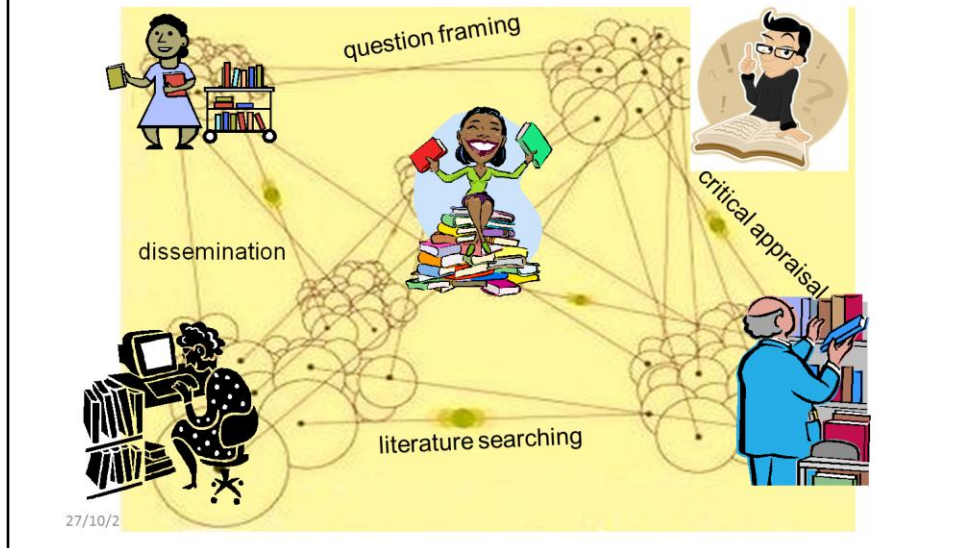
There is a long-term trend towards increased numbers of publications and increased volume of published literature. This puts an enormous strain on library budgets which rarely keep pace with the growth in publication volume (Sconul/LISU, 2009). It seems likely, therefore, that even those researchers who have reported in a recent survey (Petrokofsky et al. 2008) that they have no problem with keeping up to date with the literature are not, in reality accessing the full range of research which is available. There is great potential for bias if reviewers are selecting studies from a relatively limited range of publications.

# Collaborating to share resources and expertise



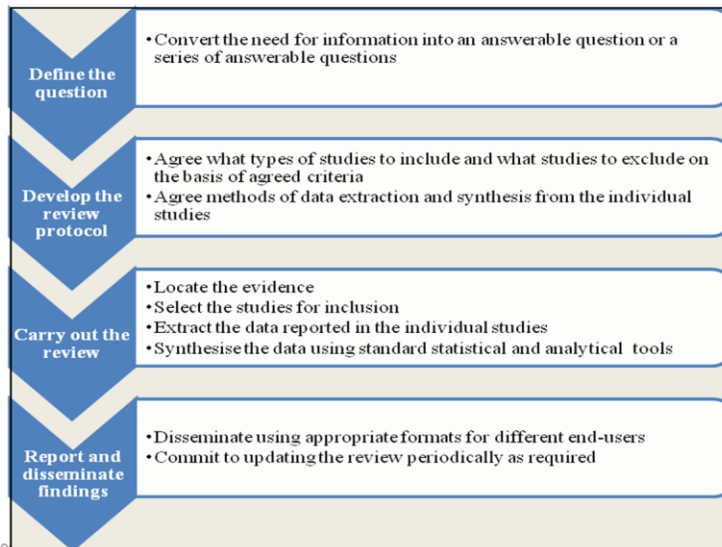
The guidelines for systematic reviews produced by the Cochrane Collaboration, the Campbell Collaboration and the Centre for Evidence Based Conservation all advocate working with librarians and information specialists to develop effective literature search strategies. Each of Cochrane's more than 50 Review Groups, which specialize in particular areas of medicine or public health (<http://www.cochrane.org/contact/entities.htm#CRGLIST>), have on their Editorial Team a Trials Search Coordinator (TSC), who is usually a professional librarian or information specialist. Many TSCs have also co-authored reviews (Swinkels, 2006).

# Collaborating to share resources and expertise



A corpus of knowledge needs first to be established on how librarians can most usefully serve the research process, which will itself come from experiment. We recommend that forestry research projects give serious consideration to the inclusion of a librarian in each research team from the outset, building the funding of such positions into the project budget, and requiring publication of the methods used and outcomes of the librarian's contributions to the project as part of standard project outputs. This would lead to a body of literature that can itself be systematically reviewed, thus allowing the spread of good practice.

# Stages in a systematic review



Forestry librarians and information specialists would appear to have a clear role to play in all stages of the systematic review process in addition to their important role as resource locators, particularly of the unpublished and 'grey' literature which is a key resource for evaluation.

This evolving role for information specialists will require specialist training and library school curricula will in due course need to be adapted to provide that

# Recommendations

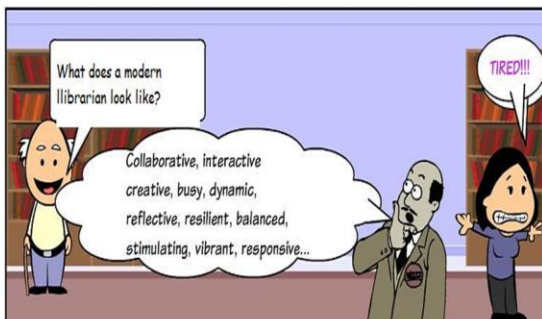
- Forum to discuss evidence-based forestry

- IUFRO 6:03/IUFRO Congress 2010
- Other networks

- Embedded librarians and information professionals

- Appropriate training in library schools

- Network of systematic review centres with librarians at the heart



**Muchas Gracias! Thank you!**

A forum is needed to discuss the practicalities of this approach and set up a pilot; this role is well suited to the International Union of Forest Research Organization's unit 6.03, *Information Services and Knowledge Organization*, and could be taken forward at the IUFRO Congress in 2010. The role of librarians is changing in many fields, and the advantage of embedding information professionals in research teams is increasingly widely recognized (Schumacher, 2007), particularly in the biosciences and particularly in the USA. The massive amounts of new data which many projects accumulate present huge challenges both in curation and exploitation (Brown, 2006), and need to be linked to existing knowledge in reliable and accessible ways that will be of practical use in decision making. Embedded librarians can bring both technical understanding and knowledge of the existing literature to the research management process, and by working alongside research staff on specific projects will gain enhanced understanding of the day-to-day challenges actually faced by researchers and help to develop targeted solutions that are relevant and cost-effective. This in turn can influence software designers and database providers to ensure that their products are closely matched to needs (Schuck, 2007).

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