The Methodological Soundness of Literature Reviews In Zoonotic Public Health

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SUMMARY

The study objective was to evaluate the methodological soundness of literature reviews in zoonotic public health (ZPH). Review articles (n=132), published over the last five years and addressing three known zoonotic or debatable zoonotic issues, were evaluated for methodological soundness using 13 criteria and two independent reviewers. None of the reviews met more than eight criteria and two met only one criterion. Literature reviews in ZPH should adhere to structured and transparent methods that are employed in systematic reviews. These would allow their users to assess the review validity and the appropriateness of its utilization in a decision making process.

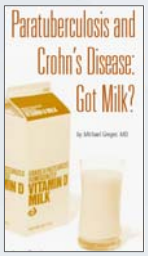
ZOONOTIC PUBLIC HEALTH

ZPH spans multiple scientific disciplines and a variety of stakeholders. These issues are often underpinned with a large amount of primary research, often resulting in contradictory findings and/or opposite recommendations. Literature reviews are important format for synthesising the evidence from multiple sources and informing the end-readers, such as researchers, program officials or policy makers, on the overall issue importance, potential policy options and/or knowledge gaps and future research needs.

SELECTED ISSUES

The research team selected three actual or potential zoonotic issues based on their importance to research and policy communities in medical, veterinary and agri-food fields. These were:

1. *Mycobacterium avium* ssp. *paratuberculosis* (**MAP**) as a potential cause of Crohn's disease in humans
2. The use of antimicrobials in animals as a risk factor for the development of antimicrobial resistance (**AMR**) in human pathogens
3. The potential zoonotic risk of transmissible spongiform encephalopathies (**TSE**)
   (e.g. bovine spongiform encephalopathy in cattle)



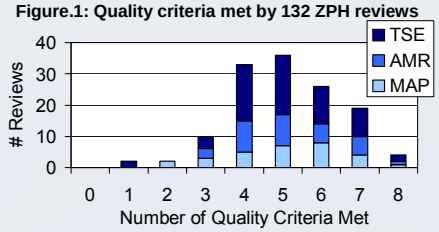
METHODS

Issue-based search algorithms were developed and pretested. Searches were implemented in August 2006 in five major electronic databases (e.g. Pubmed) using a "literature review" search filter. Two reviewers independently screened citations for relevance. Review articles were obtained and verified as literature reviews in English. The reviews were evaluated using 13 *pretested* criteria, 10 of which were previously validated. [M,A,S]

RESULTS

Among 132 assessed reviews, 73, 31, and 28 were published in journals from human medicine and public health, veterinary and animal science and microbiology and food science fields, respectively. The zoonotic aspect of the issue was focus in 59 reviews; in 73 reviews this aspect was covered in a subsection of the review. None of the reviews met all criteria (Figure 1). Detailed results on methodological soundness of the reviews are shown in Table 1. Most reviews had appropriate conclusions for evidence presented in the review, however in many reviews discussion on heterogeneity between studies and recommendations for future research were not provided.

Figure.1: Quality criteria met by 132 ZPH reviews



Conclusions

- Literature reviews in ZPH are methodologically of poor quality
- Structured and transparent methods should be routinely utilized for synthesising issue related reviews
- Expert-based reviews should be published as commentaries

TABLE 1: METHODOLOGICAL SOUNDNESS OF 132 LITERATURE REVIEWS

Criteria	Answer	MAP	AMR	TSE	Overall
The review stated a focused question. †, M, A, S	Yes/No	26/7	26/10	39/27	**88/44**
The method of locating evidence was described.†, M, A, S	Yes/No	2/28	0/36	0/66	**2/130**
Explicit criteria were stated or used to select studies.†, M,A, S	Yes/No	2/28	0/36	0/66	**2/130**
The validity or quality of studies was assessed and the process was reproducible. †,M,, A, S	Yes/No	0/30	0/36	0/66	**0/132**
Sources of heterogeneity in existing evidence for the zoonotic aspect of the issue was referred to or addressed. †,M, A, S	Yes/No	14/16	14/22	23/43	**51/81**
The author(s) position on the evidence for the zoonotic association. A	Yes/No	9/4	30/0	49/2	**88/6**
	Inc/ND	17/0	5/1	13/2	**35/3**
The author(s) position on the evidence for a zoonotic risk to public health.	Yes/No	6/6	27/0	55/1	**88/7**
	Inc/ND	18/0	5/4	7/3	**30/7**
The author(s) attempted to express the magnitude of zoonotic risk through a measure of effect.	Yes/No	0/30	1/35	3/63	**4/128**
Quantitative synthesis of evidence on the zoonotic risk was included in the review by the author. †, M, A, S	Yes/No	0/30	0/36	2/64	**2/130**
Human health outcomes associated with the issue were mentioned. †, A, S	M+M/CTT/NA	11/0/19	17/2/17	40/4/22	**68/6/58**
The conclusions of the review were supported by the information presented in the review. †, M, S	Yes/No	23/7	33/3	62/4	**118/14**
The directives for future research (identifying gaps in knowledge) initiatives were stated. †, M, A, S	Yes/No	14/16	19/17	31/35	**64/68**
The cost or economic aspects of the zoonotic issue were mentioned. †, A	Yes/No	3/27	3/33	4/62	**10/122**

Inc, inconclusive; **ND**; not discussed; **M+M**, Author indicated increased morbidity and mortality; **CTT**, author indicated increased cost to treat; **N/A**, not applicable. † Quality Criteria.

Criteria previously used by (references);
M Mulrow, C.D. 1987, The medical review article: state of the science, Ann Intern Med **106**, 485-8.
A McAlister, F.A., H.D. Clark, C. van Walraven, S.E. Straus, F.M. Lawson, D. Moher, and C.D. Mulrow. 1999, The medical review article revisited: has the science improved?, Ann Intern Med **131**, 947-51.
S Sargeant, J.M., M.E. Torrence, A. Rajić, A.M. O'Connor, and J. Williams. 2006, Methodological quality assessment of review articles evaluating interventions to improve microbial food safety, Foodborne Pathog Dis **3**, 447-56.

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