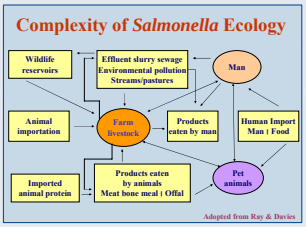
Challenges and Opportunities for Utilizing Systematic Reviews in Zoonotic Public Health

Lisa Waddell[1,2], Andrijana Rajić[1,2], Jan Sargeant[2,3], Wendy Wilkins[4] and Scott McEwen[2]

[1]Policy Advice and Effectiveness Program, Laboratory for Foodborne Zoonoses, PHAC, Guelph, Ontario.
[2]Department of Population Medicine, Ontario Veterinary College, Guelph, Ontario.
[3]Centre for Zoonoses, Ontario Veterinary College, Guelph, Ontario.
[4]Western College of Veterinary Medicine, Saskatoon, Saskatchewan.

ZOONOTIC PUBLIC HEALTH

Zoonotic public health (ZPH) spans multiple scientific disciplines and a variety of stakeholders. Examples include avian influenza, antimicrobial resistance, and transmissible spongiform encephalopathy. These issues are often inherently complex with primary research resulting in contradictory findings and recommendations to policy makers.



SYSTEMATIC REVIEWS IN ZPH

Systematic reviews (SR) have been utilized to a limited extent in ZPH. The Policy Advice and Effectiveness Program, Public Health Agency of Canada (established in 2004), together with academic collaborators, developed a guide[1] for conducting SRs in this area and published several SRs and meta-analyses (MA) addressing ZPH questions.

Our objective is to highlight the major challenges and opportunities experienced with the implementation of SRs on ZPH, using three already conducted SRs as examples.

CHALLENGES

Methodological: Existing SR methodology is largely designed to synthesize data from randomized control trials (RCT). Observational studies often represent important source of evidence in ZPH.

Question complexity: ZPH questions are often broad and require refinement into multiple specific focused questions. Such questions require the development and utilization of complex search strategies.

Complexity of search strategies: Lack of methodological filters; low specificity of search.

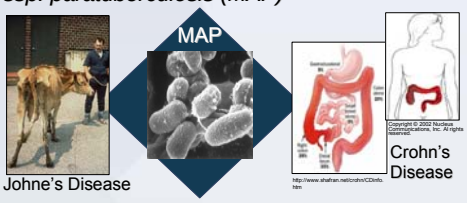
Quality of primary research:

- Lack of high quality primary research
  - Poor study design and/or poor reporting?
  - Lack of RCTs
  - Lack of power and precision within studies
- High heterogeneity often precludes MA

SPECIFIC CHALLENGES

Etiology Review

The zoonotic potential of Mycobacterium avium ssp. paratuberculosis (MAP)[2]



Wide range of scientific evidence (microbiology, human medicine, epidemiology, animal and veterinary science)

Observational studies are the source of main evidence.

Lack of standardization in study design, population (comparison groups), laboratory methods and analysis of results.

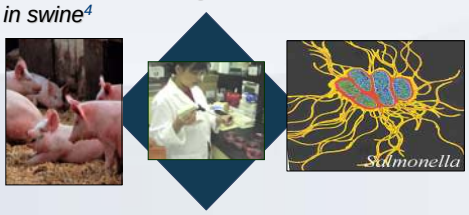
Intervention Review

Preharvest Interventions to Reduce E. coli O157 in Domestic Ruminants[3]

Main evidence comes from small clinical and challenge trials (unique to veterinary science) - often not representative of field conditions

Diagnostic Test Performance Review

Performance of diagnostic tests for Salmonella in swine[4]



Insufficient detail on test protocols.

Large variability among test protocols.

Inconsistent use of reference tests & lack of a gold standard.

Test performance estimates or raw data are not clearly reported.

OPPORTUNITIES

SRs in ZPH are useful to:

Identify effective interventions

Summarize and interpret research evidence in transparent, structured and replicable ways

Evaluate strengths and weaknesses in existing research

Identify knowledge gaps

Provide recommendations for targeting future research

Generate evidence-based inputs for further translation into

- Risk assessment
- Risk management planning
- Multi-criteria decision analysis
- Other techniques

RECOMMENDATIONS

Multiple stakeholders in ZPH increasingly require issue specific evidence-based summaries of the global knowledge base.

SR-MA are powerful methods that should be applied to larger extent in ZPH.

The Cochrane Collaboration should consider developing a working group for ZPH:

- To establish guidelines for applying systematic reviews in this area
- To co-ordinate multiple review groups in conducting SR-MA in ZPH and prevent potential duplication.

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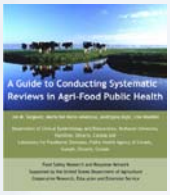

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