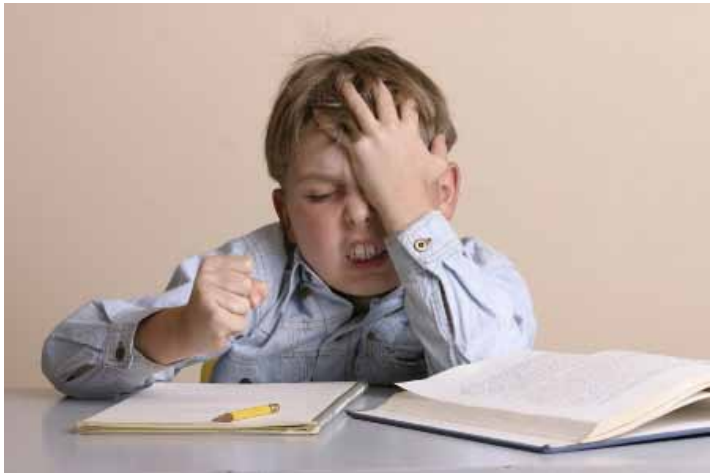
Critical Appraisal – Where Do I Start?

An Introduction to the New PHAC Toolkit



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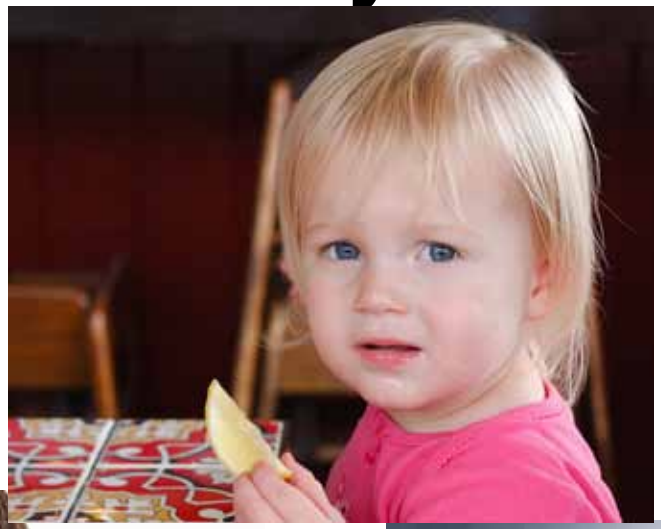
Why is Critical Appraisal of Studies Important?

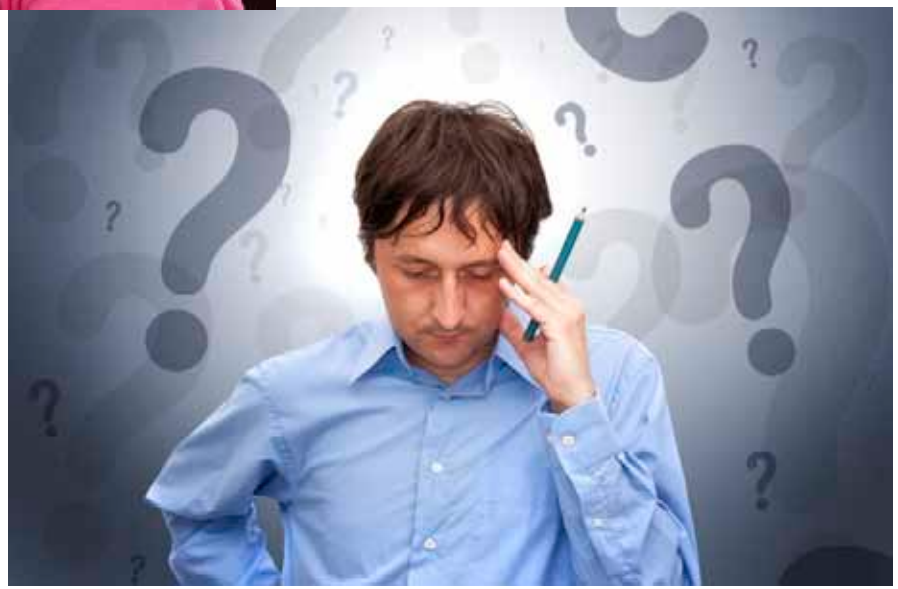
- Decisions are made based upon recommendations stemming from the studies
- These decisions often have huge far reaching implications
  - Unintended consequences for patients and staff
  - Costs and resources – finite amount available
  - Reallocation of resources away from something important to something not so important

Key Message

- Often an appraisal of a study is based on reading the discussion and conclusions.
- Your conclusions about a study should be based on your appraisal of the methods and results – NOT on the authors conclusions.
  - Authors discussion and conclusions can help identify biases , other explanations, provide context etc.

Frustration – it's like a booger you can't flick off your finger !!!





A New Tool

- A critical appraisal toolkit has been developed by PHAC to promote consistency in the appraisal of a body of evidence, grading the evidence and developing recommendations.

- Pilot of this toolkit occurred in 2009 and recently the final version has been realesed.

PHAC Critical Appraisal Toolkit

- Guides one through the process of appraising a study's design and quality and there by the strength of the evidence.
- Ideally appraisals are done by a group of people who discuss and reach consensus on conclusions
  - There is no perfect study
  - Critical appraisal is NOT an exact science

The Critical Appraisal Tool

Will guide you through a series of steps to help you determine if the evidence reviewed sufficiently demonstrates an association between the exposure and the outcome while ruling out other explanations.

Critical Appraisal Tool Contents

1. Evidence Grading System and definitions
2. Tools for naming the study design (algorithms with legends)
3. *Critical Appraisal Tool Dictionary and Critical Appraisal Tools for analytical & descriptive studies and literature Reviews*
4. Instructions for writing evidence summary tables and recommendations
5. Sample of an evidence summary table with recommendations

The Steps:

- Identify why you are reviewing the article
  - Focus on the methods and outcomes relevant to your Key Question
- Read the methods section
- Name the study design
  - Refer to the methods used for the study
  - Do not accept the authors identification of the study design unless you agree

The Steps:

- Describe the study's content related to the Key Question
- Critically appraise the study using the appropriate tool (quality of study)
- Document (using the Evidence Summary Table) for each study under the Key Question
- Summarize the studies and conclusions on the summary table to form the basis of the recommendation

Definitions of the Terms Used to Evaluate Evidence

- Strength of Study Design
  - Strong, moderate, weak
- Quality of the Study
  - High, medium, low
- Number of Studies
  - Multiple (4 or more), Few (3 or less)
- Consistency of results
  - Consistent, inconsistent, contradictory
- Directness of evidence
  - Direct, extrapolation

Strength of Study Design

- *RCT (randomized controlled study)*
- *CCT (controlled clinical trial) = controlled before-after = lab experiment*
- *Meta-analysis (depending upon strength of studies pooled)*
- *Cohort*
- *Case-control*
- *Interrupted time series with adequate baseline*
- *Cohort with non equivalent comparison group*
- *Uncontrolled before-after*
- *Interrupted time series with inadequate baseline*
- *Descriptive (cross-sectional > ecological)*

Evidence Summary Table

Key Question: Is ABHR effective for hand hygiene in health care settings?

Author, Year, Source	Participants, Intervention, Methods and Outcome Measures	Results	Conclusions and Comments: Strength of Design, Quality and Directness of Evidence
Larson (2001) AJIC	1 group: 2% CHG wash 2nd group: ABHR (61% ethanol) Measured skin condition and skin microbiology. 2 ICUs 50 volunteers (different types of HCWs) 10 working days, recorded HH and pt contact, validated diaries and HH techniques Cultures at baseline, day 1, end of weeks 2 and 4	No significant differences in log reduction between two groups but bacterial counts did decrease significantly from baseline in both groups ABHR took significantly less time than CHG Skin improvements in skin condition in ABHR group 50% reduction in material costs for ABHR group	RCT Strong design High quality Conclusion is that ABHR is not better than HW with antiseptic soap for CFU count but has other advantages They did not compare ABHR to HW with plain soap

Text Summary For Key Question:

Recommendation:

ABHR is the preferred method of hand hygiene

Evidence Grade: A1

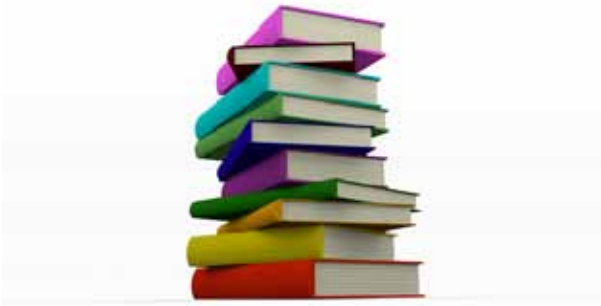
Rationale for evidence grade rating:

Multiple studies of strong design and high quality, consistent results, all directly relevant to effectiveness of ABHR in reducing hand bacterial count in clinical setting, with support from additional studies of lesser design/quality but consistency of results. Studies also support that ABHR increases HH compliance.

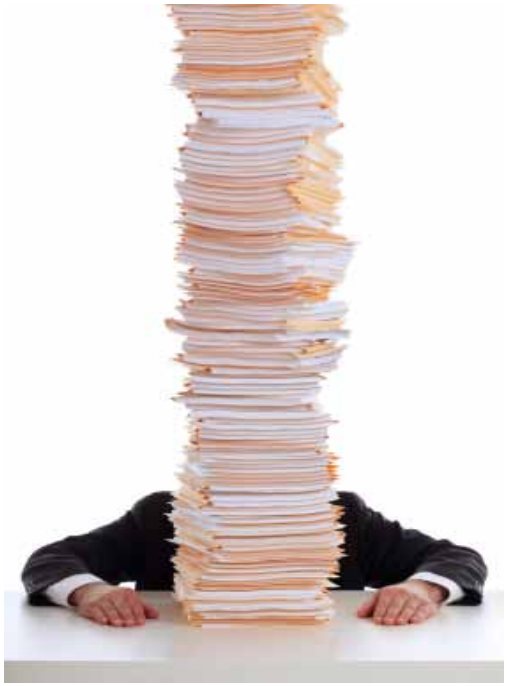
About Outbreak Reports

- Some that investigate epidemiological links include group comparison. These would be considered analytic studies.
- The majority are descriptive studies
  - Case series and case reports
- ORION Checklist for Outbreak Reports
  - 2009 ORION statement

In The IPAC World



We frequently are obliged to provide a recommendation by combining the information that is known about the organism/process/outcome along with a few weak/moderate design studies and outbreak or case reports.

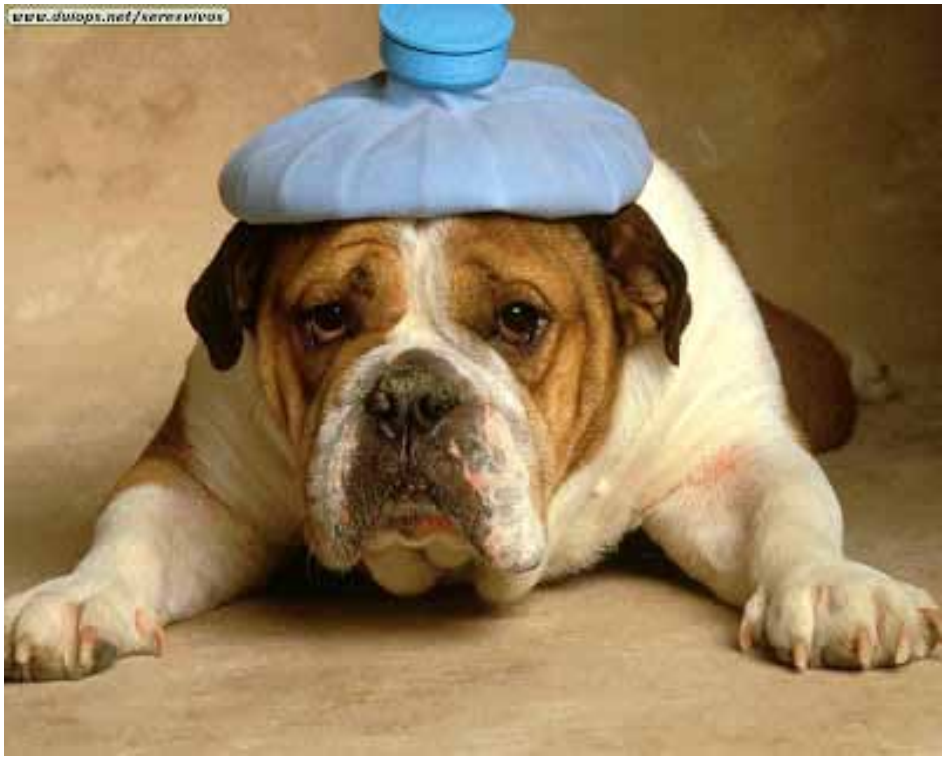


My Experience with the Toolkit

- Took a lot of brain power and concentration
- Frequent looking back and forth when appraising a study
- Length of time to go thru all the steps initially almost an hour per study
- By the end of the afternoon I wanted to poke myself in the eye with a sharp stick

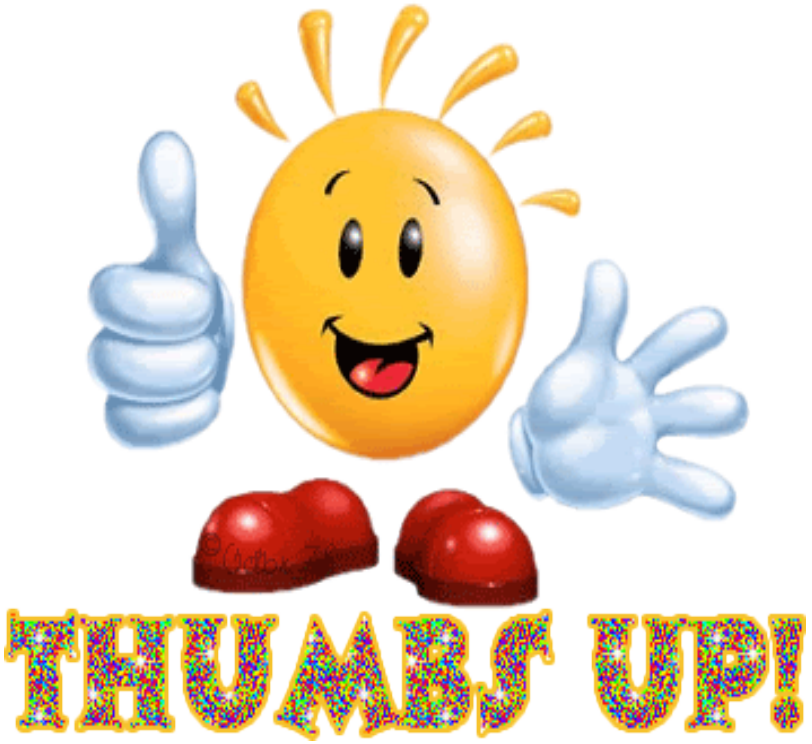
Things I Said to Myself

- You’re just dumb
- This is too hard
- My brain hurts



BUT.....

- The more I used it, the quicker it went
- I felt growing confidence with my decisions and conclusions
- This really is a very good tool!



A Very Useful Tool BUT……

Assumed a graduate student level of knowledge

Very time consuming to learn and develop skill using it.

- Concerns that this would prevent folks from discovering and using it

YET

Thirst for knowledge and skills surrounding evaluating evidence

What can I develop to assist this process?

Introduction to Critical Appraisal Toolkit

- A module to review some of the terms used in the toolkit
- Go in to further explanations about the elements of various study designs
  - Expand on the information in the toolkit and fill in the pieces where knowledge was assumed
- First experiences using the toolkit will be less frustrating, more gratifying

Introduction to Critical Appraisal Toolkit

Using IC examples:

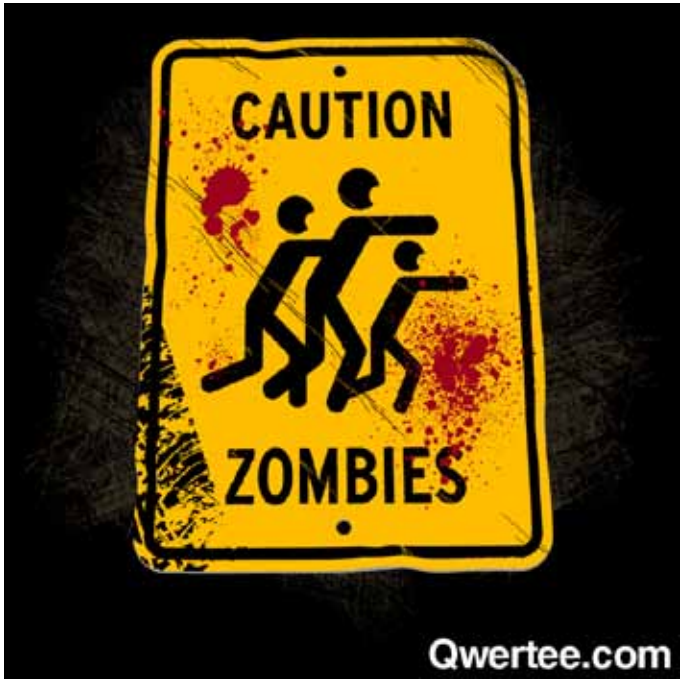
1) Research and Key questions
2) Study Designs
3) Quality of Study (bias, confounding, generalizability, reliability, validity, ethics, statistical or clinical significance, retention and follow-up).
4) Looking for folks for pilot group

Future Dreams

- Journal Club
  - Once a month teleclass that chooses 2 or 3 studies
  - Provides opportunity to discuss the study methods and key learnings/conclusions
- IPCs use their clinical experiences to influence research
  - active in developing research questions

It all starts with a Question

WARNING !!



This process will still take time, practice and patience.

Your skills will require continual nurturing