What Are Systematic Reviews, And Why Do We Need Them?

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Group Exercise 1:

How do you know ahead of time if a policy intervention works?
Group Exercise 2:

What is Evidence?
Some Features of Evidence

• Evidence is information or data that supports, or rejects, a conclusion
• Evidence is almost always probabilistic
• Often disagreement on what counts as ‘evidence’
• Evidence is always contestable/contested
• Evidence is rarely self-evident
• Evidence can be about what is generalisable – and what is particular
• Hence evidence in both quantitative and qualitative
• Not all research is of equal value/sufficient quality
• Single studies can misrepresent the balance of evidence
• Hence, the need for systematic reviews/synthesis of evidence
Why Do We Need Systematic Reviews?

Sheer amount of available evidence

“Beyond the capacity of the human mind”
What Are Systematic Reviews?

- A way of establishing the *overall balance of empirical evidence* on a topic or policy

- And separating *higher quality* from lower quality evidence

- A way of identifying what is *generalisable* and what is *context specific*
Why Do We Need Systematic Reviews?

- Single studies can:
  - Misrepresent the *balance* of research evidence
  - Illuminate only one part of a policy issue
  - Be sample-specific, time-specific, context-specific
  - Often be of poor quality
  - Consequently, give a biased view of the overall evidence
Worms.

Single study evidence

_Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities_  
Edward Miguel & Michael Kremer  
_Econometrica_, 2004

‘Deworm the world’,  
Large deworming programmes  
Kenya and India

**Systematic review evidence:** “it is probably misleading to justify contemporary deworming programmes based on evidence of consistent benefit on nutrition, haemoglobin, **school attendance or school performance** as there is simply insufficient reliable information to know whether this is so”
What Makes a Review Systematic?

- Systematic searching for studies
- Systematic critical appraisal of identified studies – separating the wheat from the chaff
- Systematic and transparent inclusion/exclusion of studies for final review
- Systematic and transparent extraction of data
- Systematic statistical testing and analysis
- Systematic reporting of findings
Searching for Evidence

Systematic Searching for Studies

- Electronic Sources
  - Databases
  - Electronic Libraries
    - Internet
- Print Sources
  - Journals
  - Textbooks
    - Handsearching
- 'Grey' Literature
  - Databases (e.g. SIGLE)
  - Conference Proceedings
  - Research Funders
Types of Systematic Review

- Statistical Meta-Analyses
- Narrative Systematic Reviews
- Rapid Evidence Assessments
- Qualitative Systematic Reviews
- Evidence Maps and Gap Maps
Statistical Meta-Analytical Reviews

- Involves data-pooling and statistical synthesis of independent studies
- And aggregating/cumulating samples and findings
- Seeks to measure and control bias
- Requires included studies to be as similar (homogeneous) as possible
Requirements for Homogeneity

Similarity of:

- **Population** (or sub-groups)
- **Intervention**
- **Comparator**
- **Outcome**

Overlapping confidence intervals
Group Exercise 3:

Speed Reading a (Summary) Systematic Review

Farmer Field Schools
Group Exercise 3:
Speed Reading a (Summary) Systematic Review
Farmer Field Schools [FFS]

Group 1 - What are FFS? – Chapters 1 and 2
Group 2 – How are FFS supposed to work – Chapters 3 and 4
Group 3 – How are FFS implemented – Chapter 5
Group 4 – What difference do FFS make? – Chapter 6
Group 5 – Are FFS cost-effective? – Chapter 7
**FFS Pesticide Use** For FFS Participants And Neighbours

### FFS Participants
- Indonesia: National IPM Training Project Phase II (FAO, World Bank, GoI)
- India: Maharashtra project (National Centre for Integrated Pest Management)
- Philippines: IPM Collaborative Research Support Program (CRSP), Nueva Ecija (USAID)
- China: FAO/EU IPM Programme for Cotton in Asia, Hubei Province
- Sudan: Gezira Scheme, FAO IPM in Vegetables
- Vietnam: FAO Programme for Community IPM in Asia
- India: FAO/EU IPM Programme for Cotton in Asia
- Zimbabwe: Cotton IPM-FFS, Sanyati district
- Pakistan: FAO/EU IPM Programme for Cotton in Asia
- Kenya: Cotton IPM project (EU & PAN-UK)
- India: FAO/EU IPM Programme for Cotton in Asia
- China: FAO/EU IPM Programme for Cotton in Asia
- Sri Lanka: IPVM Project (FAO, UNEP)
- Thailand: FAO/EU IPM Programme for Cotton in Asia
- Pakistan: National IPM Programme, Khairpur
- Indonesia: National IPM Training Project Phase II (FAO, World Bank, GoI)
- Ecuador: EcoSalud
- Pakistan: Cotton IPM programme (FAO, EU, GoP)
- Pakistan: National IPM Programme, Khairpur
- Nicaragua: Project for IPM in Central America (PROMIPAC)
- China: National IPM Training Project Phase II (FAO, World Bank, GoI)
- Ecuador: Plataformas Program (FAO)
- Uganda: East African Sub-regional Pilot Project Phase II (FAO)
- Subtotal (I-squared = 93.7%, p = 0.000)

### FFS Neighbours
- Indonesia: National IPM Training Project Phase II (FAO, World Bank, GoI)
- China: FAO/EU IPM Programme for Cotton in Asia
- Pakistan: FAO/EU IPM Programme for Cotton in Asia
- Nicaragua: Project for IPM in Central America (PROMIPAC)
- Thailand: FAO/EU IPM Programme for Cotton in Asia
- Pakistan: National IPM Programme, Khairpur
- Indonesia: National IPM Training Project Phase II (FAO, World Bank, GoI)
- Subtotal (I-squared = 85.2%, p = 0.000)

### Cumulative Estimate of Effect
- **Response ratio**
  - **ES (95% CI)**
    - Favour FFS participants
      - 0.20 (0.01, 3.23)
      - 0.21 (0.17, 0.26)
      - 0.37 (0.18, 0.78)
      - 0.41 (0.36, 0.46)
      - 0.48 (0.31, 0.75)
      - 0.52 (0.24, 1.12)
      - 0.52 (0.30, 0.92)
      - 0.57 (0.36, 0.89)
      - 0.59 (0.41, 0.87)
      - 0.61 (0.52, 0.71)
      - 0.67 (0.46, 0.97)
      - 0.71 (0.64, 0.80)
      - 0.82 (0.74, 0.90)
      - 0.82 (0.68, 0.98)
      - 0.83 (0.75, 0.93)
      - 0.88 (0.68, 1.13)
      - 0.90 (0.75, 1.09)
      - 0.91 (0.28, 2.94)
      - 0.95 (0.39, 2.34)
      - 1.30 (1.08, 1.57)
      - 1.34 (0.99, 1.80)
      - 1.42 (1.09, 1.86)
      - 0.69 (0.57, 0.84)
    - Favour non-FFS participants
      - 0.54 (0.25, 1.15)
      - 0.67 (0.12, 3.88)
      - 0.68 (0.62, 0.76)
      - 0.78 (0.40, 1.49)
      - 0.99 (0.42, 2.33)
      - 1.15 (0.92, 1.43)
      - 1.20 (0.40, 3.53)
      - 1.30 (1.09, 1.55)
      - 0.91 (0.66, 1.26)
FFS Knowledge Outcomes for FFS Participants and Neighbours

<table>
<thead>
<tr>
<th>Study</th>
<th>Standardised mean difference</th>
</tr>
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<tbody>
<tr>
<td><strong>FFS participants</strong></td>
<td></td>
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<tr>
<td>Kenya: Kenya Tea Development Agency/Lipton</td>
<td>0.03 (-0.03, 0.08)</td>
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<tr>
<td>Sustainable Agriculture Project</td>
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<tr>
<td>Peru: CIP CARE Andean FFS</td>
<td>0.14 (0.03, 0.25)</td>
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<tr>
<td>Vietnam: FAO Programme for Community IPM</td>
<td>0.17 (0.03, 0.31)</td>
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<tr>
<td>in Asia</td>
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<tr>
<td>Ghana: National Cocoa Disease and Pest</td>
<td>0.17 (0.07, 0.27)</td>
</tr>
<tr>
<td>Control Program (CODAPEC)</td>
<td></td>
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<tr>
<td>Cameroon: Sustainable Tree Crops Program</td>
<td>0.20 (0.17, 0.24)</td>
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<tr>
<td>(STCP) Phase II</td>
<td></td>
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<tr>
<td>Ethiopia: Jimma and Sidama FFS</td>
<td>0.27 (-0.06, 0.60)</td>
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<tr>
<td>Mexico: El Proyecto Manejo Sustentable</td>
<td>0.42 (0.37, 0.47)</td>
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<tr>
<td>de Laderas (PMSL)</td>
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<tr>
<td>Philippines: Central Luzon (IRRI, Phirice)</td>
<td>0.42 (-0.17, 1.01)</td>
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<tr>
<td>India: Sree Ram Sagar Project (SRSP),</td>
<td>0.45 (-0.04, 0.94)</td>
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<tr>
<td>Andhra Pradesh</td>
<td></td>
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<tr>
<td>India: FAO/EU IPM Programme for Cotton in</td>
<td>0.46 (0.18, 0.73)</td>
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<tr>
<td>Asia</td>
<td></td>
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<tr>
<td>Pakistan: Cotton IPM programme (FAO, EU,</td>
<td>0.54 (-0.22, 1.29)</td>
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<tr>
<td>GoP)</td>
<td></td>
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<tr>
<td>Ethiopia: Integrated Management of Potato</td>
<td>0.59 (0.25, 0.92)</td>
</tr>
<tr>
<td>Late Blight (CIP, IFAD)</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe: Cotton IPM-FFS, Sanyati district</td>
<td>0.67 (0.41, 0.92)</td>
</tr>
<tr>
<td>Iran: FFS programmes</td>
<td>0.79 (0.29, 1.29)</td>
</tr>
<tr>
<td>Pakistan: National IPM Programme, Khairpur</td>
<td>1.03 (0.65, 1.41)</td>
</tr>
<tr>
<td>Kenya: KARI Farmer Field School Project</td>
<td>1.14 (0.93, 1.34)</td>
</tr>
<tr>
<td>Uganda: IPM Collaborative Research</td>
<td>1.79 (1.17, 2.41)</td>
</tr>
<tr>
<td>Support Program (CRSP)</td>
<td>0.46 (0.33, 0.58)</td>
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<tr>
<td>Ecuador: unclear potato IPM (CIP)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (I-squared = 93.2%, p = 0.000)</td>
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<tr>
<td><strong>FFS neighbours</strong></td>
<td></td>
</tr>
<tr>
<td>Pakistan: National IPM Programme, Khairpur</td>
<td>-0.13 (-0.68, 0.42)</td>
</tr>
<tr>
<td>Mexico: El Proyecto Manejo Sustentable</td>
<td>-0.07 (-0.07, -0.06)</td>
</tr>
<tr>
<td>de Laderas (PMSL)</td>
<td></td>
</tr>
<tr>
<td>India: FAO/EU IPM Programme for Cotton in</td>
<td>0.05 (-0.45, 0.56)</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
</tr>
<tr>
<td>Bangladesh: National IPM Programme (FAO)</td>
<td>0.17 (-0.25, 0.59)</td>
</tr>
<tr>
<td>Ecuador: unclear potato IPM (CIP)</td>
<td>0.38 (-0.15, 0.91)</td>
</tr>
<tr>
<td>Subtotal (I-squared = 5.2%, p = 0.377)</td>
<td>-0.05 (-0.13, 0.03)</td>
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Narrative Systematic Reviews

• Provide a narrative account of what the evidence tells us
• Provide descriptive and inferential statistics
• But on each included study individually, not aggregatively
• Provide a summary analysis of what the evidence suggests
• Provide the ‘Signal’ and ‘Noise’ of evidence
Rapid Evidence Assessments – What Are They?

- Scaled down systematic reviews of existing evidence
- Timed to meet the needs of policy makers/practitioners (1-3 months)
- Strategically using the ‘three arms’ of systematic searching, but less exhaustively
- Critical appraisal of identified studies is included
- Summary of findings, with caveats and qualifications
• Not a comprehensive or exhaustive as systematic reviews;

• Hence, REAs are more likely to be subject to statistical bias than a full systematic review

• We must, therefore proceed with greater caution with REAs
• Synthesise qualitative and ethnographic evidence
• In-depth interviews, focus groups, observational studies, documentary analysis, case studies
• Seek common themes, concepts and principles across different studies
• Detailed attention to context/contextual specificity
• And stakeholders’ views
• Do not seek generalisations
Group Exercise 4

• What do you think about systematic reviews?

• What are the strengths and weaknesses of systematic reviews?

• How might you use systematic reviews for policy making, social development and research/evaluation purposes.
Thank you
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