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The Contribution of Systematic Reviews to Understanding School Effectiveness.

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Why Do We Need Systematic Reviews of Evidence

- Sheer amount and flow of information/research
- Variable quality of research outputs
- Need to separate the wheat from the chaff
- Problems of publication bias
- Need for the balance of evidence
- Limitations of single studies

Limitations of Single Studies

- Single studies can misrepresent the balance of research evidence
- Illuminate only one part of a policy issue
- Sample-specific
- Time-specific
- Context-specific
- Often of poor methodological quality
- Consequently, biased

Systematic Reviews

- "Attempt to discover the consistencies and account for the variability in similar-appearing studies"
- "Seeking generalisations also involves seeking the limits and modifiers of generalisations"
- Identify the contextual-specificity of available research and evidence"

(Cooper and Hedges, 1994:4).

Types of Research Synthesis

- Statistical Meta-Analyses (6-18 months)
- Narrative Systematic Reviews (6-12 Months)
- Rapid Evidence Assessments (1-3 Months)
- Evidence Maps and Gap Maps (1 Month)
- Meta-Ethnography/Qualitative Synthesis (6-12 Months)

WestEd

What works in developing nations to get children into school and keep them there: A systematic review of experimental and quasi-experimental evaluations

A REPORT FUNDED BY THE INTERNATIONAL INITIATIVE FOR IMPACT EVALUATION (3IE)

DECEMBER 2011

Background

- Education is critical to economic development and social welfare particularly in economically developing countries
- Many interventions to increase school attendance and to improve quality of education in developing countries.

But:

- *No systematic review of the evidence*

Meta-Analytical Reviews

- Involves data-pooling and statistical synthesis of independent studies
- And aggregating/cumulating samples and findings
- Seeks to measure and control bias

Objectives

- To determine the *effects of interventions* implemented in developing countries as measured by *students' enrollment, attendance, graduation, and progression.*
- To determine the *effects of interventions* on *learning outcomes* as measured by students' test scores, grades, and other achievement measures.

Methods – Inclusion Criteria

Studies that:

1. Assess the impact of an intervention that included *primary or secondary school outcomes* (Kindergarten-12th grade in the U.S. context) relevant to the primary research question;
2. Use a *randomized controlled trial*, or a *quasi-experimental* approach in baseline control on primary outcome was included;
3. Be conducted in a *country classified* as a "low or middle income nation" by the World Bank at the time the intervention being studied was implemented;
4. Include at least *one quantifiable primary outcome measure* (enrollment, attendance, dropout, or progression);
5. Be published or made available before *December 2009*, without regard to language or publication type; and
6. Include *data on participants from 1990* or beyond.

Methods – Search Strategy

- Development of keywords
  - Relevant to: developing nations, primary and secondary outcomes, RCT and QED evaluations
- Electronic searches of bibliographic databases
- Hand searches of relevant journals
- Citation tracking
- Contacting relevant authors and researchers
- Internet Searches and specialized holdings

Types of Interventions

- Economic (n=26)
  - Cash Transfers; Micro Finance; Labour Market; Tuition Relief etc.
- Educational Programs and Practices (n=19)
  - Remedial education, computers, flip charts, text books, and English language training technology and software
- Health Care and Nutrition (n=14)
  - Nutrition, treatment for asthma, malaria, vitamin A deficiency; school meals, etc
- Building Schools and Infrastructure Improvements (n=7)
  - Including new books; equipment; supplies, new roads, etc
- Providing Information or Training (n=7)
  - Livelihood skills, fertility control, parent training, community empowerment

Analysis

- Instrument designed to extract data from each study.
- Standardized mean differences effect sizes were computed for the first effect reported in each study, assuming random effects models.
- Main effects were analyzed for each outcome
- Meta-analysis was done to estimate overall mean effect size across studies, separately for different outcomes and across regions

‘Friendly Front End’ *(In Progress)*

- 10 new studies identified, screened for inclusion, assessed for quality, and analyzed as part of a modified update to the original review
- Update analysis of disaggregated/specific interventions
- Provide a clear set of policy issues and policy messages from the review
- In plain, accessible language
- With indications of what needs to be in place to achieve the positive outcomes that have been identified

Summary Results

- 73 included experiments and quasi-experiments in original review
- 10 new studies added in FFE
- Overall positive effect, on average, across all interventions

But:

- Aggregation of interventions - provides too gross a level of analysis (Type I and Type II errors are possible)
- Significant heterogeneity in effect sizes across all studies

Results

Average Effects by Broad Intervention Types

Largest Effects:

- New schools and other infrastructure interventions
- Health care and nutrition interventions

Smaller Effects:

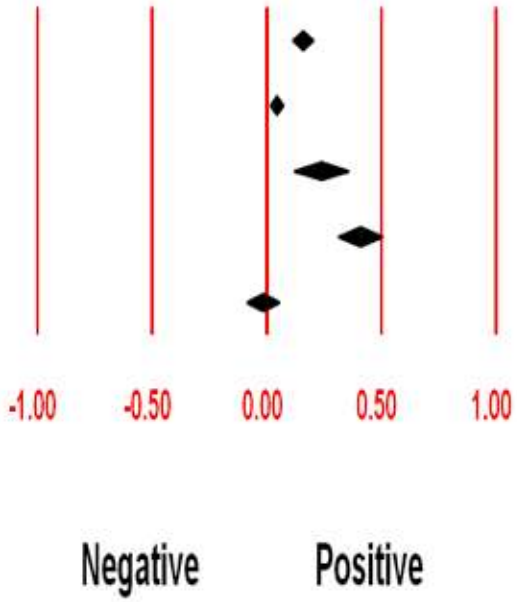
- Educational programmes
- Information giving

Results

Figure 12. Average Effects Across Broad Intervention Types

Group by Broad Intervention Type	Std diff in means	Variance	Lower limit	Upper limit
Economic (n=26)	0.158	0.001	0.113	0.204
Educational Practices/Programs (n-19)	0.043	0.000	0.015	0.071
Health Care/Nutrition (n=14)	0.236	0.004	0.118	0.354
New Schools/Infrastructure (n=7)	0.407	0.002	0.311	0.503
Providing Information/Training (n-7)	-0.017	0.001	-0.087	0.054

Statistics for each study



Results

Average Effects Across Regions

Largest Effects:

Studies that were conducted within:

- East Asia and the Pacific
- Europe or Central Asia

Smaller Effects:

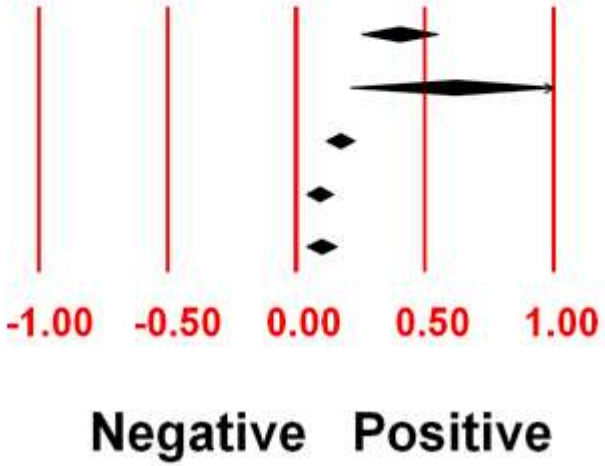
Studies that were conducted within:

- Latin America and the Caribbean
- South Asia
- Sub-Saharan Africa

Results – Across Regions

Figure 15. Average Effects Across World Bank Classification of Developing Regions

Group by Region	Std diff in means	Variance	Lower limit	Upper limit
East Asia and the Pacific (n=4)	0.400	0.006	0.253	0.547
Europe and Central Asia (n=2)	0.619	0.044	0.209	1.030
Latin America and the Carribbean (n=25)	0.170	0.001	0.115	0.226
South Asia (n=23)	0.089	0.001	0.037	0.142
Sub-Sahara Africa (n=19)	0.096	0.001	0.038	0.153



Results – Effects by WB Economic Classification

Largest Average Effect:

- Lower Middle Income Countries (LMICs)

Smaller Average Effect:

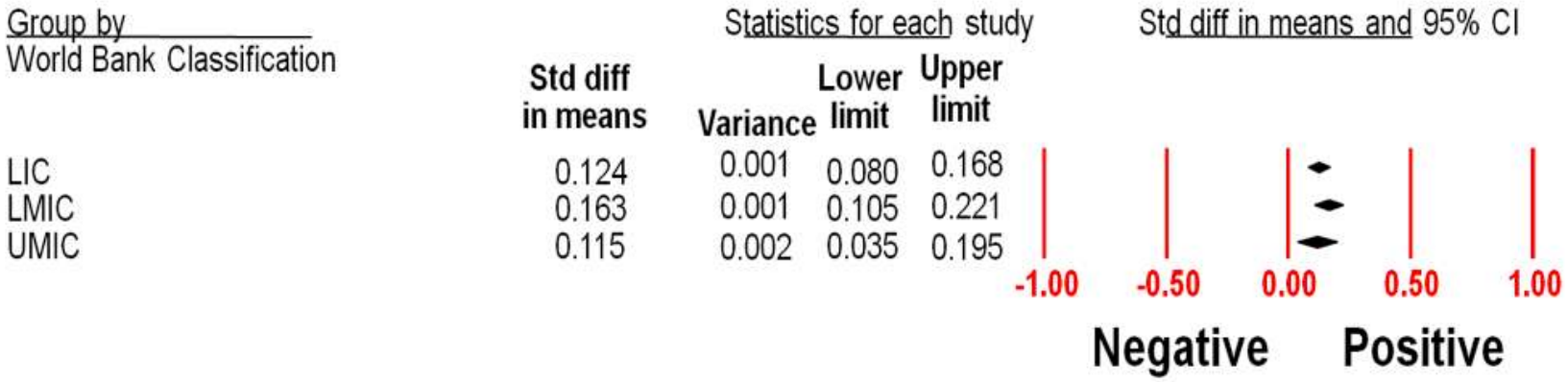
- Lower Income Countries (LICs)

Smallest Average Effect:

- Upper Middle Income Countries (UMICs)

Results – Effects by WB Economic Classification

Figure 14. Average Effects Across World Bank Classification of Economies



Heterogeneity statistics indicate that this is not a significant moderator (Q=1.39, df=2, p=.49).

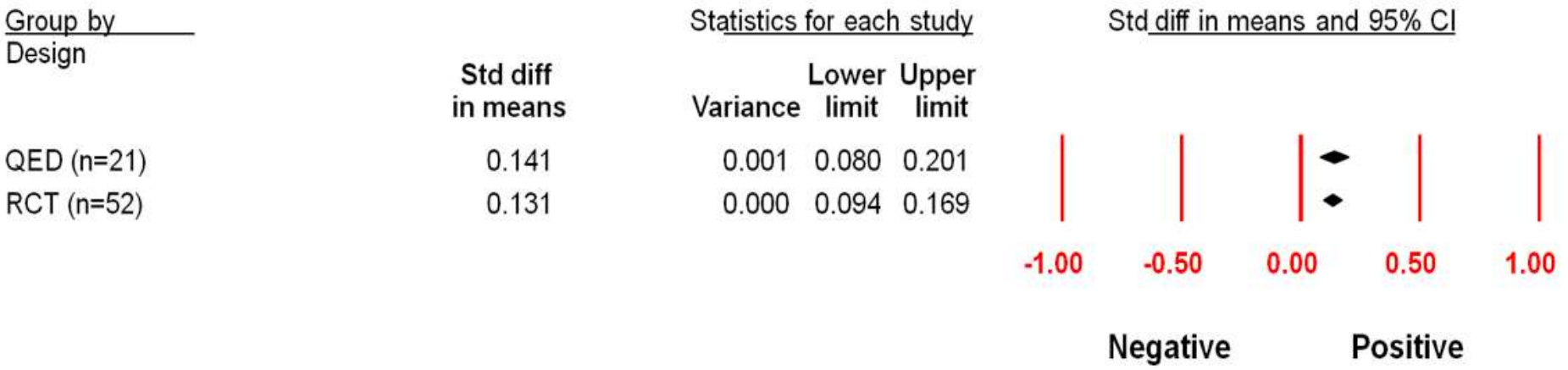
Results – Effects on Primary and Secondary Outcomes

TABLE 4. SUMMARY OF AVERAGE EFFECT SIZES FOR OVERALL INTERVENTION EFFECTS		
Outcome	Standardized Mean Effect (d)	BESD (Percentage Improvement in Treatment Over Control)
PRIMARY :		
Enrolment	.18	9%
Attendance	.15	8%
Dropout	.05	3%
Progression	.13	7%
SECONDARY:		
Math	.16	8%
Language	.18	9%
Global Test Scores	.06	3%
Other Achievement	.05	3%

BESD = Binomial Effect Size Display (Rosenthal and Rubin, 1982)

Effects Across Evaluation Designs

Figure 16. Average Effects for Different Evaluation Designs



- There was very little difference in these average effects (*d*=.13 for RCTs, *d*=.14 for QEDs).

Implications for Policy and Practice

- Interventions that address school enrollment, attendance, progression and dropouts have, on average, positive effects
- There are also positive effects on learning outcomes
- Effectiveness of interventions is *context specific*, and policy and practice should be implemented accordingly
- This requires a *theory of change analysis* – what activities, mechanisms, people, resources, and outputs are required
- And *disaggregated analysis* of specific interventions, countries and contexts
- Using qualitative and quantitative methods
- And cost-benefit/cost-effectiveness data and analysis

Thank you

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