Immunization Costing: Where are we now?

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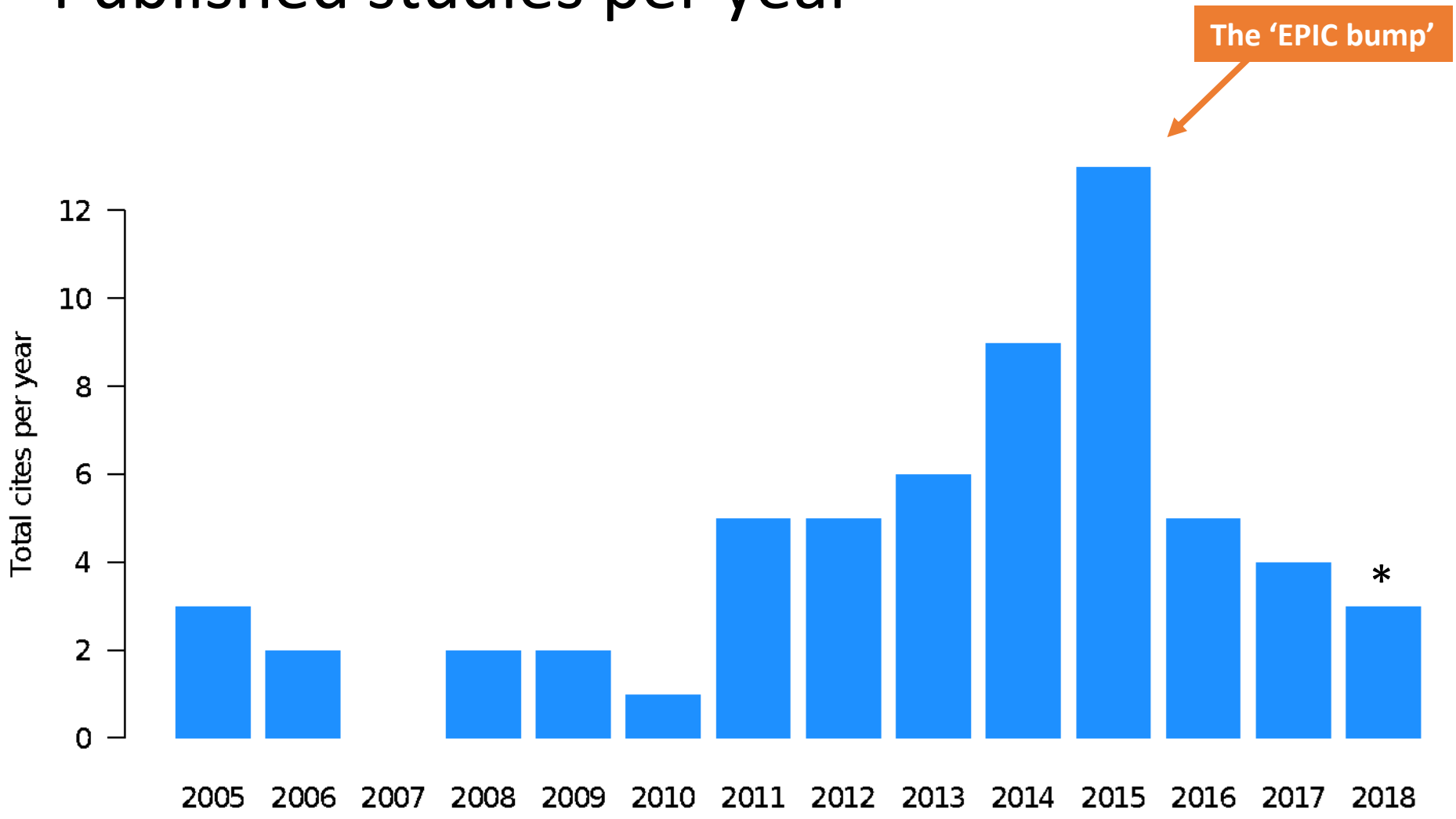
Immunization Costing: Where are we now?

More specifically, where are we now…

… on the question of what it costs to provide immunization services?

… on the question of what it costs to increase immunization coverage?

Published studies per year



* Partial year, includes citations indexed by April 2018

Data from ICAN IDCC (https://immunizationeconomics.org/ican-idcc)

Published studies per country

5	4	3	2	1
Tanzania	Benin Vietnam	India Ethiopia Mozambique	Bangladesh, Cameroon, China, Cote d'Ivoire, Honduras, Kenya, Moldova, South Africa, Thailand, Uganda, Zambia	Bhutan, Brazil, Burkina Faso, Chad, Colombia, Gambia, Ghana, Haiti, Indonesia, Iraq, Mexico, Pakistan, Peru, Rwanda, Senegal, Togo

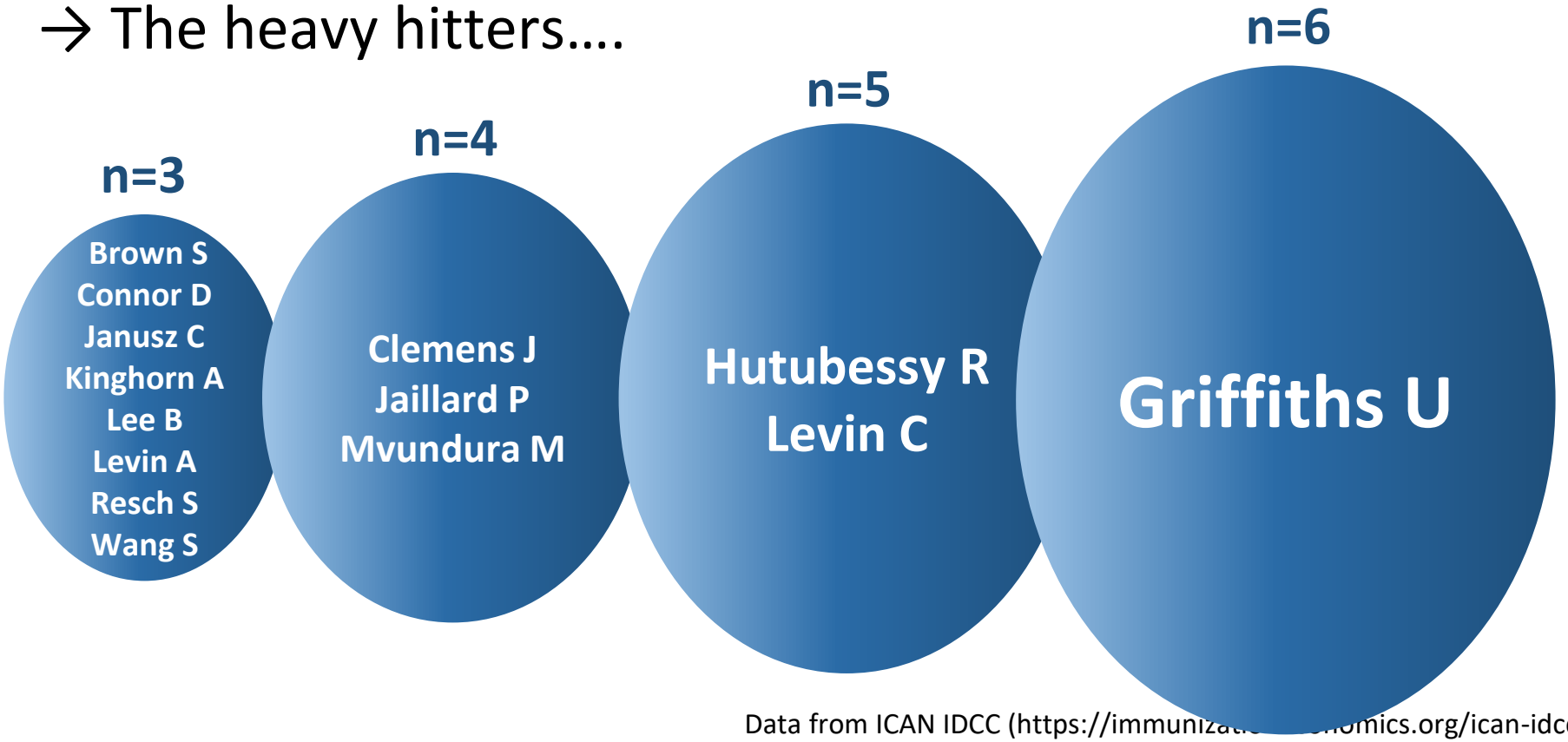
Data from ICAN IDCC (https://immunizationeconomics.org/ican-idcc)

Who is doing these studies?

→ 347 unique authors

→ 61 authors involved in multiple studies

→ The heavy hitters….



Data from ICAN IDCC (https://immunizati…omics.org/ican-idcc)

Some studies more informative than others

If we calculate:

An observation = no. service delivery sites in study

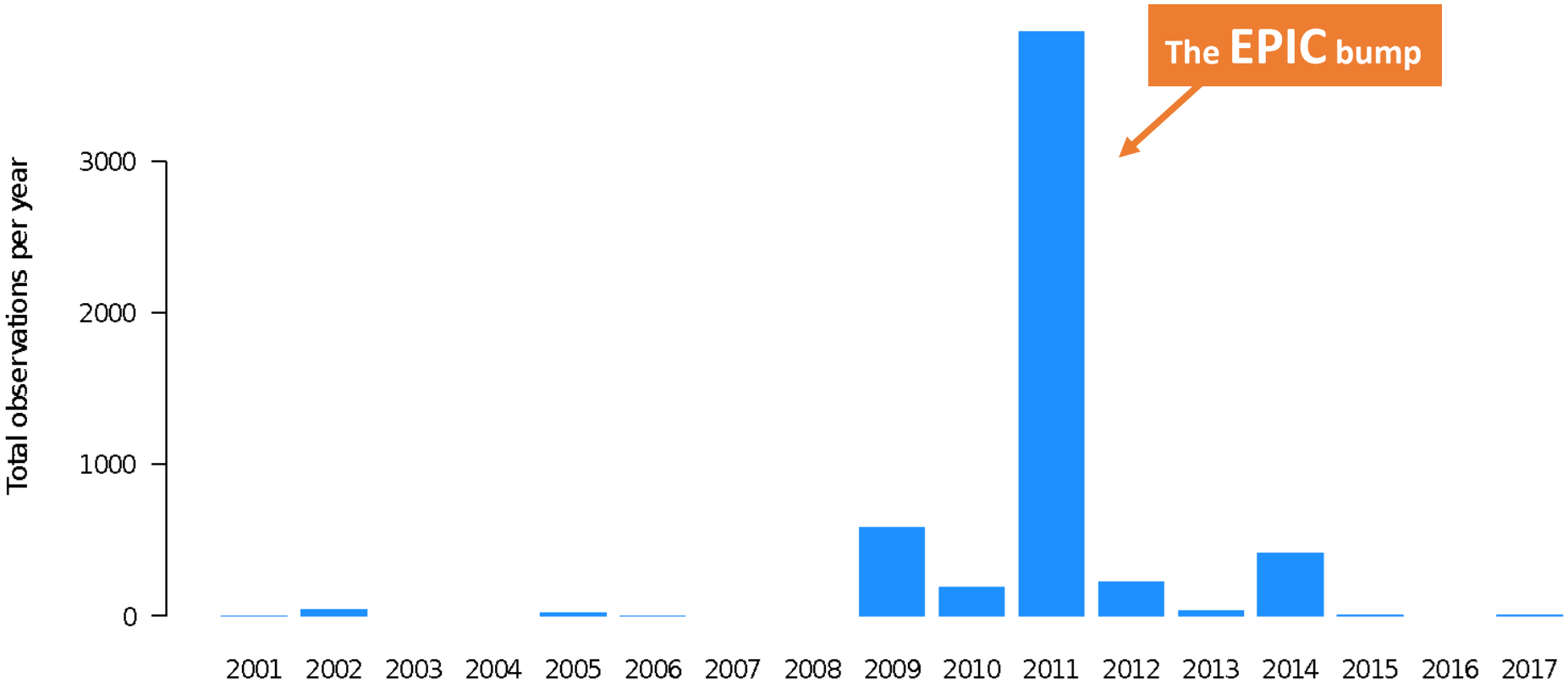
X

no. unique cost statistics reported

e.g. 20 sites, and costs reported by labor, capital, supplies

→ 20 x 3 = 60 observations

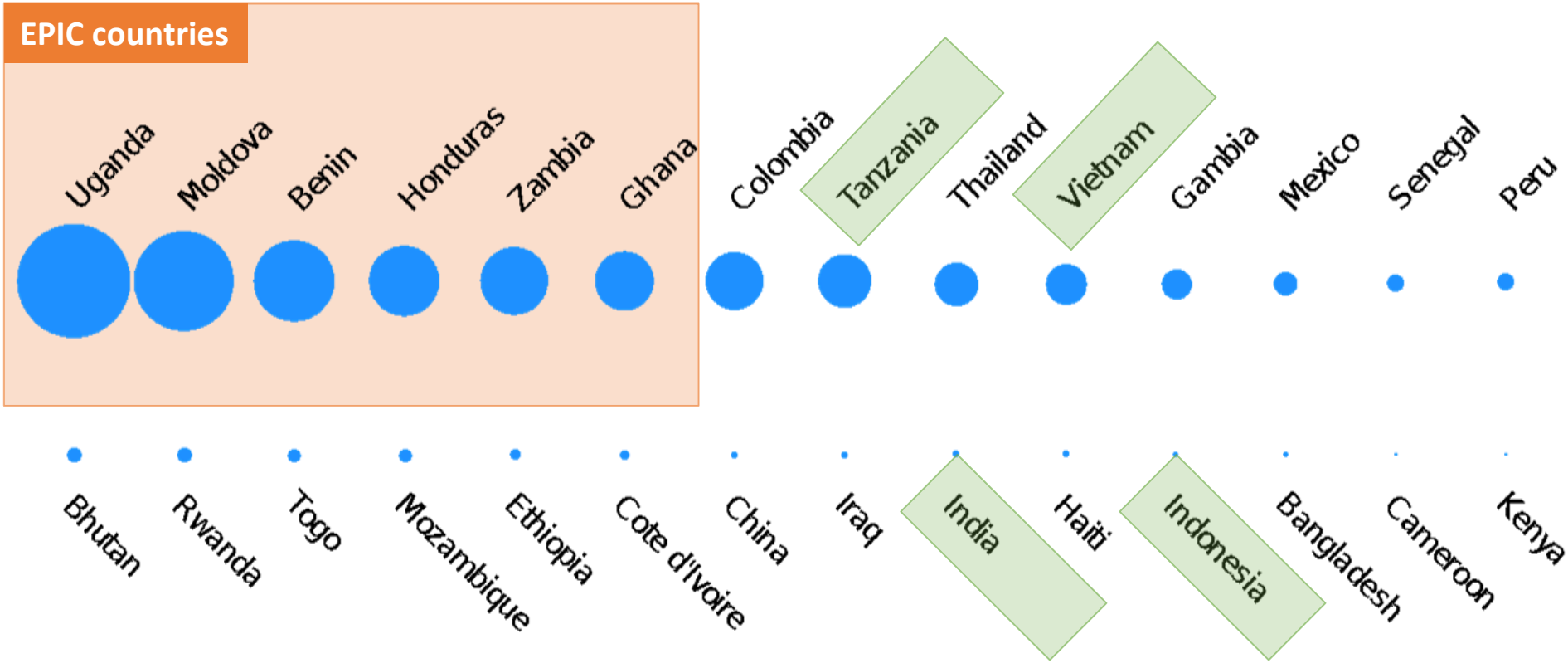
Observations collected per year*



* Now indexing by when data collected, as reported in study

Data from ICAN IDCC (https://immunizationeconomics.org/ican-idcc)

Observations per country



More data on its way! See next session

Data from ICAN IDCC (https://immunizationeconomics.org/ican-idcc)

What have we learned from these studies?

1. The current costs of providing immunization ser
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- For planning and budgeting, we want **all** countries, for **all** cost categories of interest, for the **future** rather than the past, with **high precision**
- *For now*: make the best use of the data we have → see talks by **Kelsey Vaughan** (Thinkwell/ICAN) & **Allison Portnoy** (Harvard/EPIC) in main meeting, plus discussion tomorrow!
- *For future*: consider the appropriate role and timing of large costing studies, vs. other approaches

What have we learned from these studies?

2. How costs differ within programs

Robertson 1984 The Gambia (13*)	Walker 2004 Peru (19)	Ahanhanzo 2015 Ghana (50)	Ahanhanzo 2015 Benin (46)	Goguadze 2015 Moldova (50)
Doses delivered	Facility level, Urban/rural	Doses delivered, Personnel dedication , Sufficient staffing, Cold chain equip, Staff wages, Region, Facility level, Ownership, Urban/rural User fees, Volunteers	Doses delivered, Distance to vaccine collection, Personnel dedication, Sufficient staffing, Staff wages, Region, Facility level, Urban/rural	Doses delivered, Facility level, Urban/rural
Janusz 2015 Honduras (71)	**Maceira 2015 Moldova (50)**	**Schutte 2015 Zambia (51)**	**Menzies 2017 multi-country (316)**	**Chatterjee 2018 India (188)**
Doses delivered, Facility level	Doses delivered, Staff time Salaries and prices, Facility size Cold chain, Catchment population, Facility level, Distance to vaccine collection, Wastage rate	Doses delivered, Urban/rural	Doses delivered, pc GDP, Ownership, Hospital, Outreach, Management, Urban/rural, DTP3 per dose, ANC4, Wealth ratio, Province	Doses delivered, Facility level, Distance to vaccine collection, Salaries, DTP3 per dose, Sessions per week, Female literacy rate, Wealth quintile, Rurality, District

** In parentheses: number of sites included in analysis*

What have we learned from these studies?

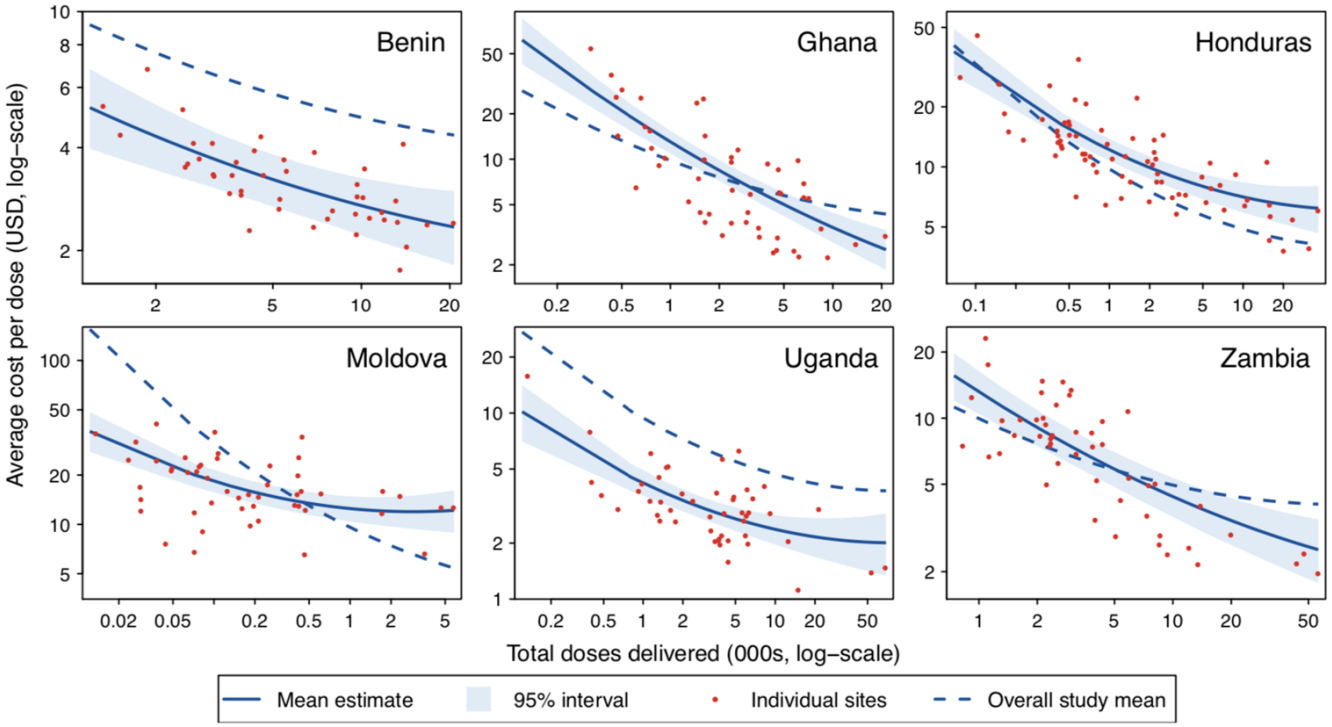
2. How costs differ within programs – *service volume*

Sites with higher service volume have lower costs per dose

This finding observed whenever it is assessed

→→→→→

Cost per dose as a function of doses delivered, EPIC countries, log-log-scale



[Menzies et al 2017, BMC Med]

What have we learned from these studies?

2. How costs differ within programs – *service volume*

This is not a new nor surprising finding.

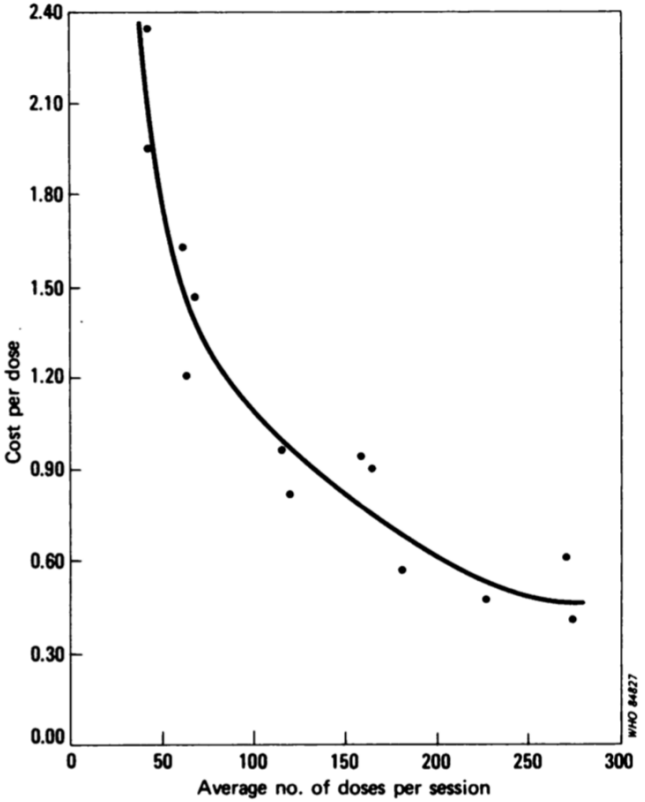


Fig. 1. Average cost in US dollars per dose, excluding cost of expatriate personnel, in relation to the average number of doses per session (service volume) for the 13 field units, from 1 July 1980 to 30 June 1981.

[Robertson et al 1984, Bull WHO]

What have we learned from these studies?

2. How costs differ within programs – *service volume*

But it matters!

Clarke E et al. Estimators used in multisite healthcare costing studies in low- and middle-income countries: a systematic review and simulation study. *Value in Health, in press*

- ➢ Different approaches to calculating the average cost per dose can produce very different estimates
- ➢ An example: with a sample of 50 sites, the simple average (mean of site-level cost per dose) will be outside 50-150% of the true value a **large fraction** of the time

See Emma Clarke's Tuesday presentation for this number! (July 16th, 10.30am -- 12.00pm)

What about the costs of increasing coverage?

- Four reviews conducted on the subject:

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Vaccine

The effects and costs of expanding the coverage of immunisation services in developing countries: a systematic literature review

Elisabetta Pegurri, Julia A. Fox-Rushby*, Walker Damian

Abstract

1. Introduction

2. Methods

Pergurri et al 2005

- Published literature up to Dec 2001
- Able to calculate ICERs for 3 studies
- Requests more methodological consistency
- Requests costing alongside planned interventional trials

What about the costs of increasing coverage?

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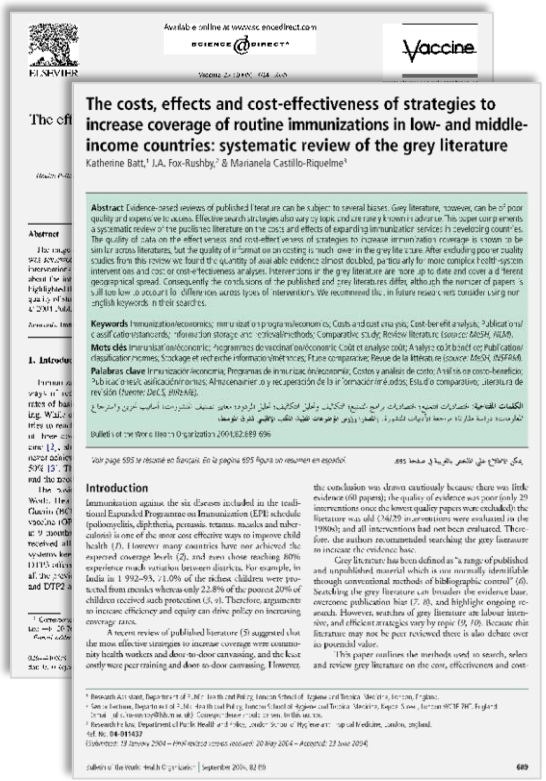

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Vaccine

The costs, effects and cost-effectiveness of strategies to increase coverage of routine immunizations in low- and middle-income countries: systematic review of the grey literature

Katherine Batt,[1] J.A. Fox-Rushby,[2] & Marianela Castillo-Riquelme[3]

Abstract Evidence-based reviews of published literature can be subject to several biases. Grey literature, however, can be of poor quality and expensive to access. Effective search strategies also vary by topic and are rarely known in advance. This paper complements a systematic review of the published literature on the costs and effects of expanding immunization services in developing countries. The quality of data on the effectiveness and cost-effectiveness of strategies to increase immunization coverage is known to be similar across literatures, but the quality of information on costing is much lower in the grey literature. After excluding poor quality studies from this review we found the quantity of available evidence almost doubled, particularly for more complex health-system interventions and cost-effectiveness analyses. Interventions in the grey literature are more up to date and cover a different geographical spread. Consequently, the conclusions of the published and grey literatures differ, although the number of papers is still too low to account for differences across types of interventions. We recommend that, in future reviews, researchers consider using non-English keywords in their searches.

Keywords Immunization/economics; Immunization programs/economics; Costs and cost analysis; Cost-benefit analysis; Publication and classification standards; Information storage and retrieval/methods; Comparative study; Review literature (source: MeSH, NLM).

Mots clés Immunisation/économie; Programmes de vaccination/économie; Coût et analyse coût; Analyse coût bénéfice; Publication/classification normes; Stockage et recherche informatisée; Revue comparative; Revue de la littérature (source: MeSH, INSERM).

Palabras clave Inmunización/economía; Programas de inmunización/economía; Costos y análisis de costo; Análisis costo-beneficio; Publicación/clasificación normas; Almacenamiento y recuperación de la información/métodos; Estudio comparativo; Literatura de revisión (fuente: DeCS, BIREME).

Bulletin of the World Health Organization 2004;82:889-896

Introduction

Immunization against the six diseases included in the traditional Expanded Programme on Immunization (EPI) schedule (poliomyelitis, diphtheria, pertussis, tetanus, measles and tuberculosis) is one of the most cost effective ways to improve child health (1). However, many countries have not achieved the expected coverage levels (2), and even those reaching 80% experience much variation between districts. For example, in India in 1992–93, 21.0% of the richest children were protected from measles whereas only 22.8% of the poorest 20% of children received such protection (3, 4). Therefore, arguments to increase efficiency and equity can drive policy on increasing coverage rates.

A recent review of published literature (5) suggested that the most effective strategies to increase coverage were community health workers and door-to-door canvassing, and the least costly were peer training and door-to-door canvassing. However, the conclusion was drawn cautiously because there was little evidence (60 papers); the quality of evidence was poor (only 29 interventions once the lowest quality papers were excluded); the literature was old (24/29 interventions were evaluated in the 1980s); and all interventions had not been evaluated. Therefore, the authors recommended searching the grey literature to increase the evidence base.

Grey literature has been defined as "a range of published and unpublished material which is not normally identifiable through conventional methods of bibliographic control" (6). Searching the grey literature can broaden the evidence base, overcome publication bias (7, 8), and highlight ongoing research. However, searches of grey literature are labour intensive, and efficient strategies vary by topic (9, 10). Because the literature may not be peer reviewed there is also debate over its potential value.

This paper outlines the methods used to search, select and review grey literature on the cost, effectiveness and cost-

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[3] Research Fellow, Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, London, England.

Bulletin of the World Health Organization | September 2004, 82 (9) 669

Batt et al 2004

- Grey literature up to May 2003
- Five studies assessed cost-effectiveness, only 3 considered in review
- More recent results, but more methodological heterogeneity
- Requests studies report disaggregated results to allow translation across settings

What about the costs of increasing coverage?

- Four reviews conducted on the subject:

Ozawa et al 2018

- Published literature up to March 2017, not restricted to LMIC
- Estimates from 42 (!) studies included in quantitative syntheses, most from HIC
- Find higher incremental costs with higher baseline coverage
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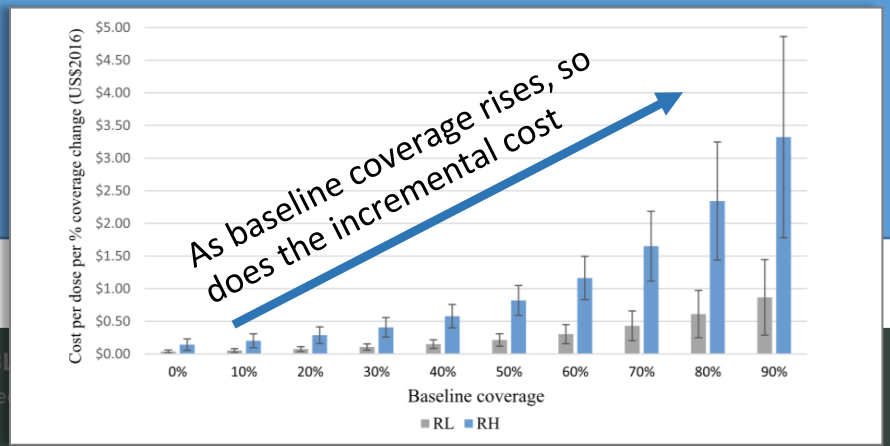

What about the costs of increasing coverage?

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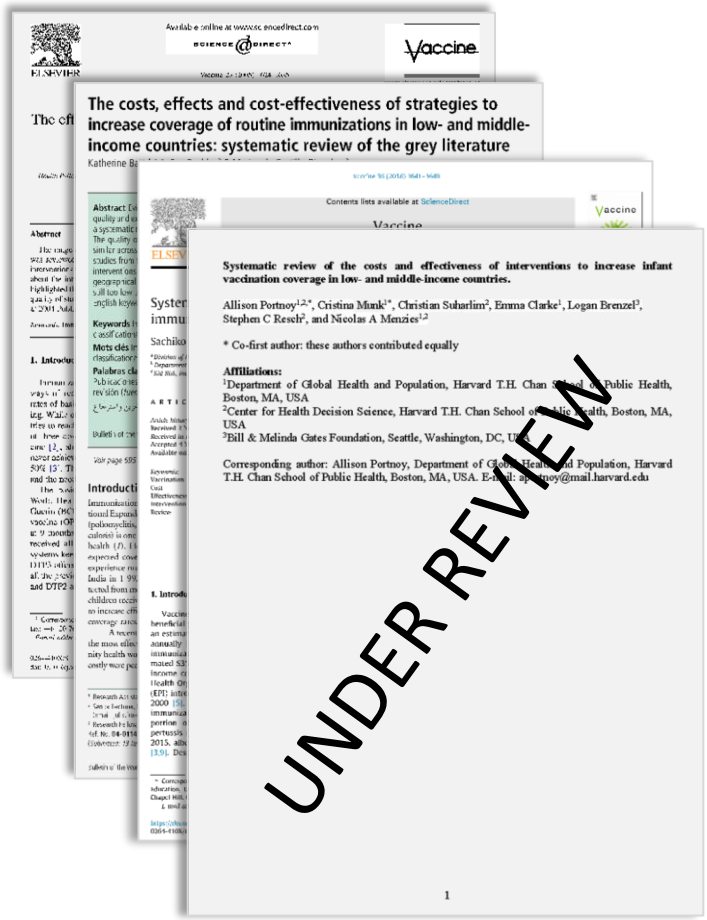

Munk, Portnoy et al

- Published and grey literature 2001-2019
- Estimates from 13 studies included in review
- Variety of settings, interventions and methods. Wide range of ICERs
- Request more standardized reporting, integration of costing studies into field trials to increase coverage

What about the costs of increasing coverage?

Conclusion:

- Despite the central importance of increasing immunization coverage, we have little information on the relative cost-effectiveness of different approaches for doing so
- For these estimates to be useful, need to focus on well-defined interventions, in well-defined contexts
- No one study will fix this, but more studies will certainly help!

See presentation on IMI in India in ~ 45mins