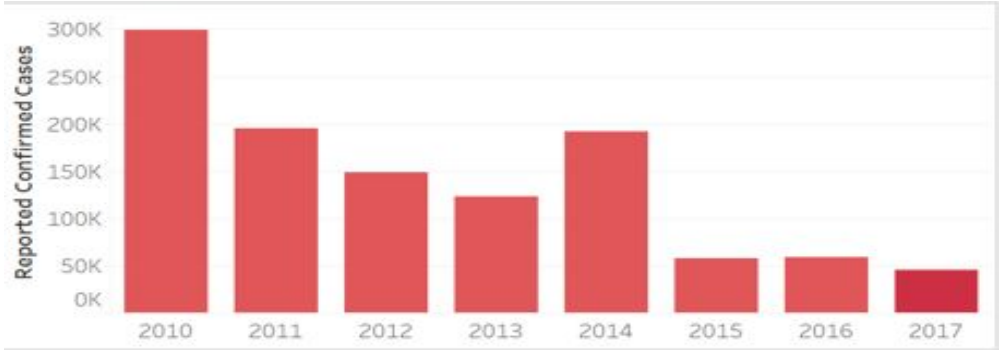
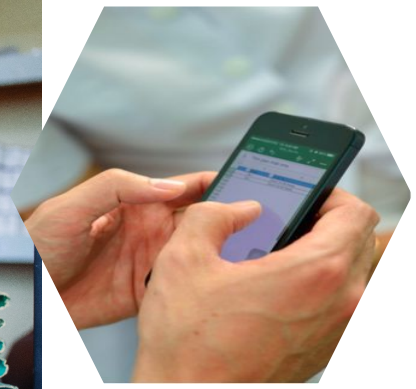
The impact of digital health interventions on data use and health outcomes

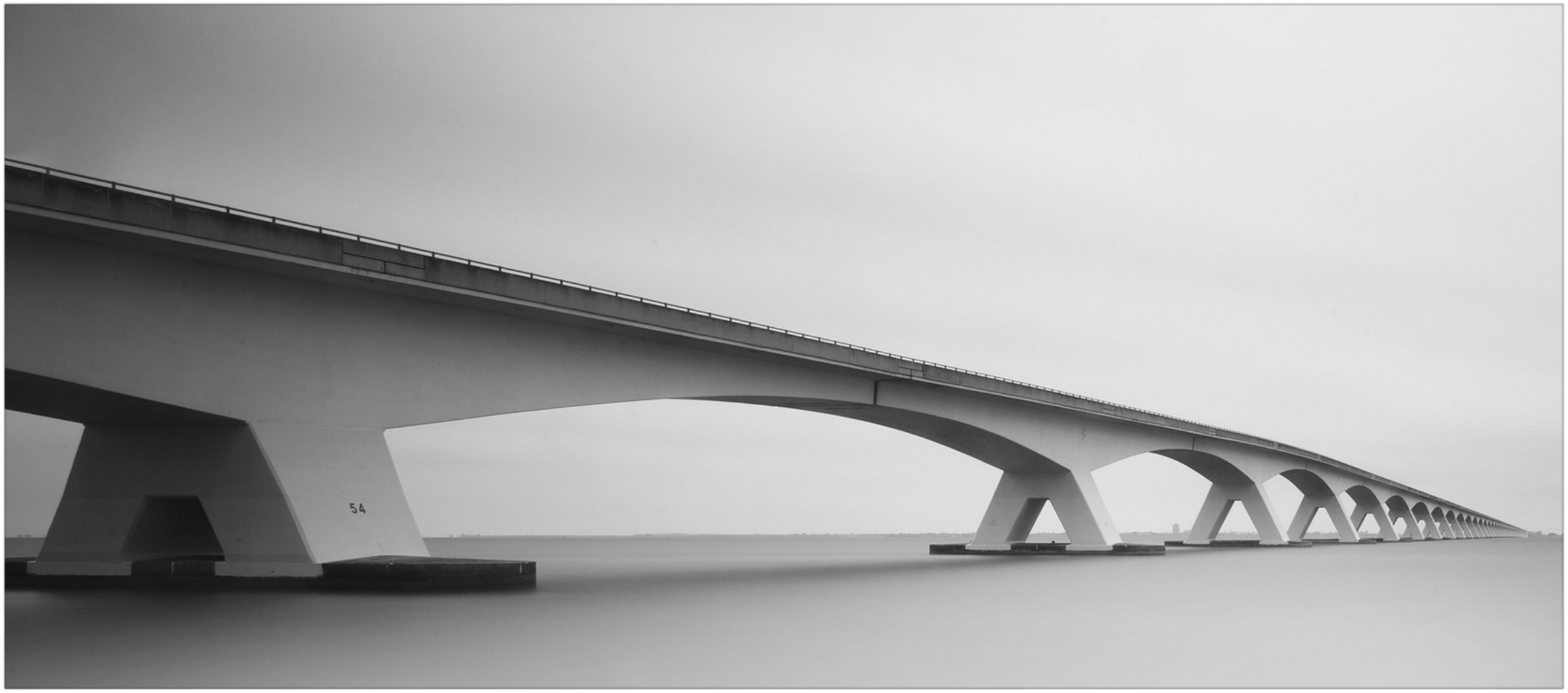
Save (quality of) lives





Save time

Save money



Data Quality in the Expanded Programme on Immunization in Low and Middle-Income Countries: A Scoping Review

Nargis Rahimi

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Shifo

Aim and Research Questions

1)What is the current quality of data in EPI programme in LMIC?

2)What factors contribute to poor/good data quality in LMIC?

3)What can be done to improve data quality?

Methods

Inclusion Criteria:

1) Primary or secondary outcome related to data quality in EPI, factors impacting data quality or proposed interventions to improve data quality.

2) Study based in a LMIC (as classified by the World Bank in February 2018).

3) Original study

4) Peer-reviewed publication

Limitations:

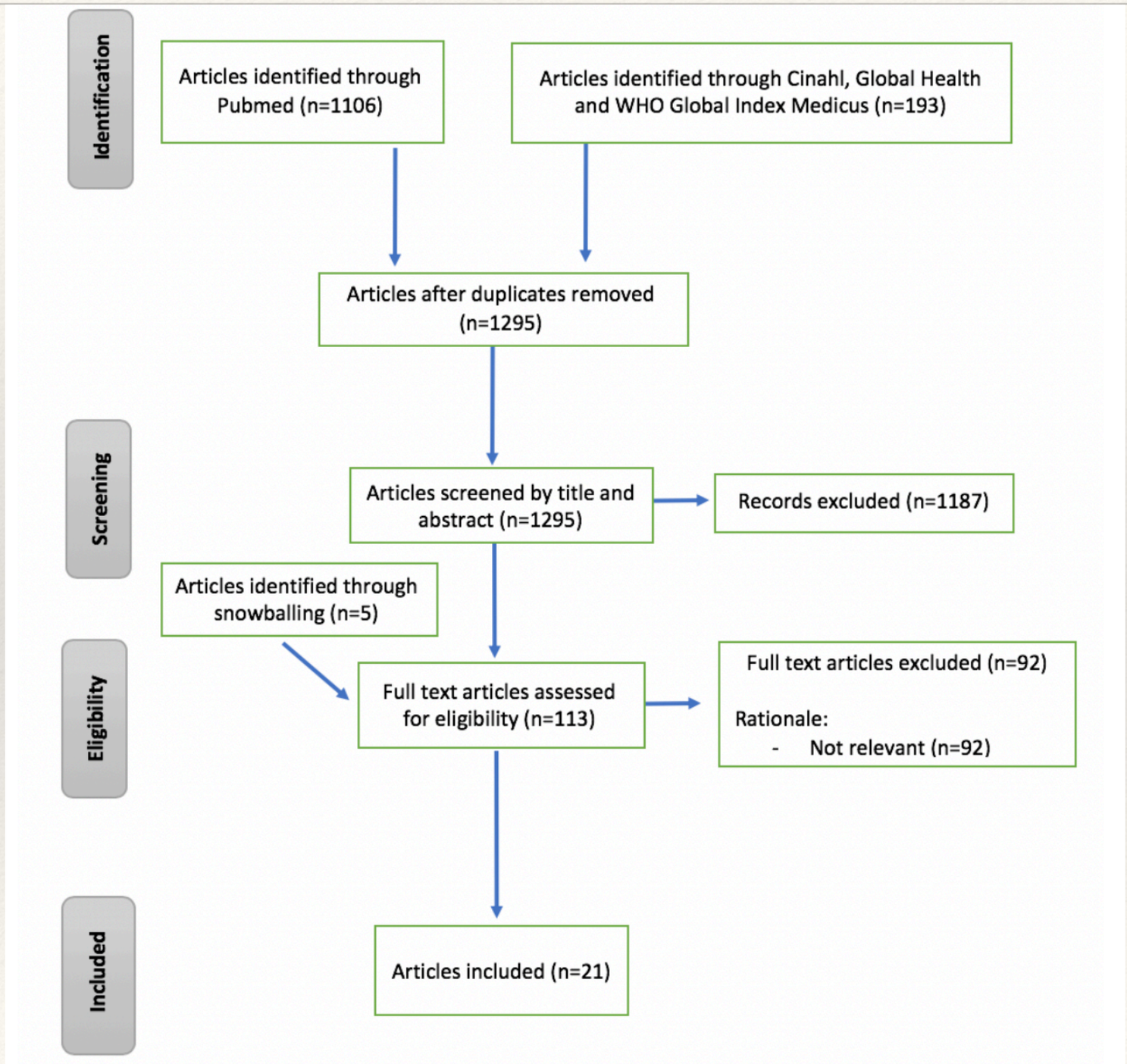
1) Grey literature not included

2) Two articles not assessed as full-text unavailable

3) No commentary on quality of research underlying the articles

4) Articles may have been missed, despite the broad reach of the search strategy

Search


Identification
Articles identified through Pubmed (n=1106)
Articles identified through Cinahl, Global Health and WHO Global Index Medicus (n=193)
Articles after duplicates removed (n=1295)
Screening
Articles screened by title and abstract (n=1295)
Records excluded (n=1187)
Articles identified through snowballing (n=5)
Eligibility
Full text articles assessed for eligibility (n=113)
Full text articles excluded (n=92)
Rationale:
- Not relevant (n=92)
Included
Articles included (n=21)

Results

Published over a 29 year period
17 since MDGs, 5 since SDGs

Predominantly descriptive
18 cross-sectional (4 supplemental qualitative data)

Standardised data quality assessment tool in 5

Geographical spread
6 cohort, 10 Sub-Saharan Africa, 4 Asia, 1 Latin America

Only 3 quasi-experimental

14 assessed data quality against DTP3

What is the current quality of data in EPI programmes in LMIC?

Scale of the problem

- Over-reporting estimates range 119-224%. (9,10)
- The higher the reported coverage, the more significant the over-reporting. (11)
- Under-reporting less frequent. (11,12)
- Particularly evident at the facility level. (10, 13-15)

DQS Assessments

- ⅓ of countries had Verification Factors (VFs) suggestive of moderate over-reporting. (14)
- ⅓ had VFs suggestive of considerable over-reporting. (14)
- Wide CIs for VFs and some incalculable due to poor quality (14,16)
- Quality Index poor across all countries evaluated. (14)

Data Quality Components

-

- Aforementioned problems with data accuracy.
- Completeness: 20% of demographic data missing. (17)
- Reliability: Poor data concordance. (15)
- Timeliness: Only 78.7% deemed timely. (9)

What different factors contribute to the data quality seen in EPI programmes in LMIC?

Contributory factors

Structural Weaknesses in HIS	Lack of standardised data processes & tools	Overreliance on targets	Inadequate training & supervision of health workers	Insufficient performance feedback
HIS fragmentation – may exclude private sector & NGO data. (11) Lack of basic data storage means e.g. filing and internet. (9,10,11,15,16,18)	Unstandardised data collection tools limit comparisons. (11) Frequent changes to tools. (11) Duplicate tools. (9,11,15) Data quality lost during report creation. (9)	Often set by high-level decision-makers. (13,19) Felt to be unrealistic. Perverse incentive of results-based financing targets. (11-13,16)	Only 59% could accurately complete a vaccination card. (14) Lack of stability. (10,15) <50% of facilities had supervisory visit in last 4m. (14) Focus rarely quality. (10)	61% countries and 23% districts give feedback. (14) Demotivating impact. (18) Feeling of an 'upward system'. (10)

What can be done to improve data quality in EPI programmes in LMIC?

Mechanisms for monitoring data quality

01 Improved monitoring of quality will improve quality.

02 Decentralised target setting (12)

03 Independent monitoring & data verification (11,13)

04 Tools ranging from GIS to DQS proposed (11,14,20)

05 Irrespective of tool: simple, standardised & realistic for health workers to use. (12,15,21)

Training and supervision of health workers

01 Training dedicated to data collection & management (10,12,13,15,16,22,23)

02 Workshops shown to be effective mechanism (24)

03 Nominated officer for data collection & analysis (18)

04 Financial incentives for data quality (9,16)

05 Timely & relevant feedback on submitted data (9,12,24)

Discussion

Research

- Clear paucity of research.
- Inconsistent means of assessing and defining data quality.
- Need for focus upon key areas identified in this review e.g. characterisation of the difficulties faced by health workers.
- Need for further quasi-experimental/experimental studies

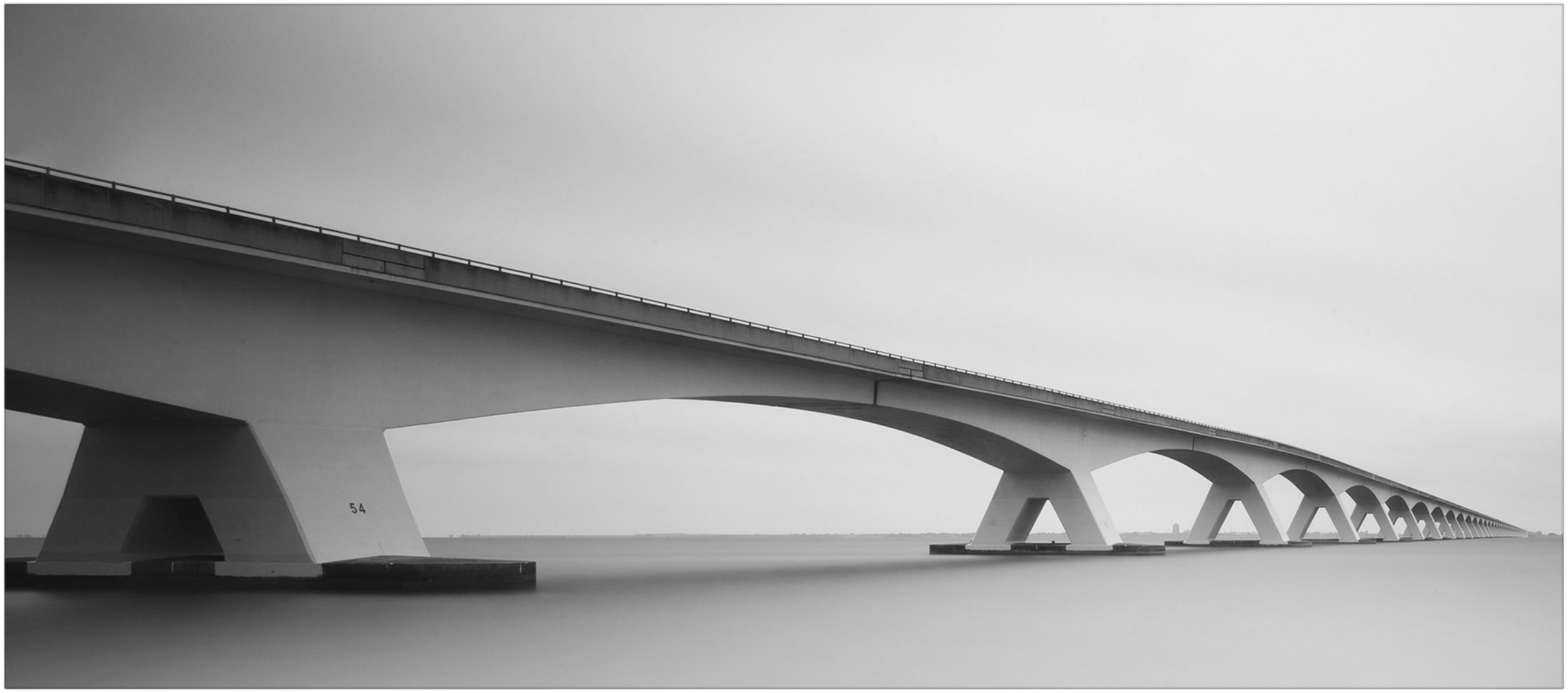
Policy

- Ensure universal availability of basic provisions e.g. tally sheets. (25)
- Simple, standardised data collection tools
- Prioritisation of capacity-building.
- Supportive, regular supervision.
- Timely and relevant performance feedback
- Engagement of health workers in the design of HIS.
- Data sharing policies and norms between different sectors.
- Clear indicators for policies e.g. GVAP 2020. (7)

Conclusions

Both the need for quality data and the magnitude of the problem faced in EPI in LMIC evident in the research identified in this scoping review.

Any proposed intervention must be sustainable and decision-makers must be mindful of the long-term cost-savings achievable with high quality data.



Thank you!

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IDEA

A realist review of what works to improve the use of routine data in immunization decision-making: evidence from low- and middle-income countries

Jessica Shearer, PhD

PATH

Global Digital Health Forum 2018

Quality Data. Better Decisions. More Impact.

Photo credit: PAHO/WHO

We think that better use of data can help save time, save resources, and save lives. How can we strengthen data use?

- ✓ Lean into what's working
- ✓ Learn from what isn't
- ✓ Invest in filling knowledge gaps

Overarching questions for realist review

1. <u>What</u> are the most effective (and cost-effective) interventions to improve the use of data for immunization decisions? What does not work?

2. <u>Why</u> do these interventions produce the outcomes that they do?

3. <u>How</u> do their effects differ by context?

Approach


Theory of change
Search strategy
Data extraction
Synthesis
Gap map

Theory of Change: Supporting data-informed decision-making for immunization programs

- Generate demand for data
- Build awareness and positive attitudes toward data use
- Transform data producers into data users

Demand

- Build user-centered data collection tools
- Improve data availability
- Adapt analytic tools and systems to user information needs

Access & availability

- Improve data quality

Quality

- Build data analysis skills and knowledge
- Support transformation of data into actionable information

Skills

- Improve data use infrastructure
- Strengthen performance management and supportive supervision
- Strengthen decision-making structures and processes

Structure & process

- Improve timely and effective communication of data to decision-makers

Communication

Behavior change components

- Capability
- Motivation
- Opportunity

Timely, high-quality data are more available

Data are analyzed

Data are synthesized

Data are interpreted

Data are reviewed

Communities and health facilities:
- Know their target populations better
- Regularly collect / review data on immunization status
- Identify and follow up on unvaccinated
- Monitor vaccination coverage rates
- Monitor disease burden and respond to outbreaks
- Use data to manage vaccine supply and cold chain
- Use data to improve data quality

Health districts:
- Regularly collect and report relevant data
- Regularly review and use data to manage vaccine supply and cold chain, improve program performance, improve data quality, and monitor and prevent disease outbreaks
- Use data to manage campaigns

National program managers:
- Regularly review immunization and disease surveillance data
- Use information to monitor progress, and prioritize geographic areas and populations
- Inform vaccination strategies and policies

Increase immunization coverage and equity

Context

- Policies, leadership, and governance around data and information systems
- Human resources and continuing professional development
- Harmonized and interoperable data systems
- Electricity and Internet infrastructure

Citations: Aqil et al. 2009; Nutley et al. 2013; Langer et al. 2016; Zaiko et al. 2017; World Health Organization, Framework for Partner Collaboration to Strengthen Immunization and Surveillance Data for Decision-making (draft), 2017.

Search results

1
Theory of Change

549
Documents Reviewed

119
Published literature

+

181
Grey literature
Full text review

69
Pieces of Evidence

+

34
Promising Projects

+

Evidence Gap Map

Intervention components

- Dashboards
- Data review meetings
- Data quality assessments
- Decision support tools
- Effective vaccine management
- Electronic immunization registries and information systems
- Home based records
- LMIS
- Mentorship
- Peer learning, journal clubs, WhatsApp groups
- Supportive supervision
- Training

Photo: PATH/Trevor Snapp.

Top IDEA Findings

Many Parts Make a Better Whole

Build a Culture of Data

Take a Health Systems Approach

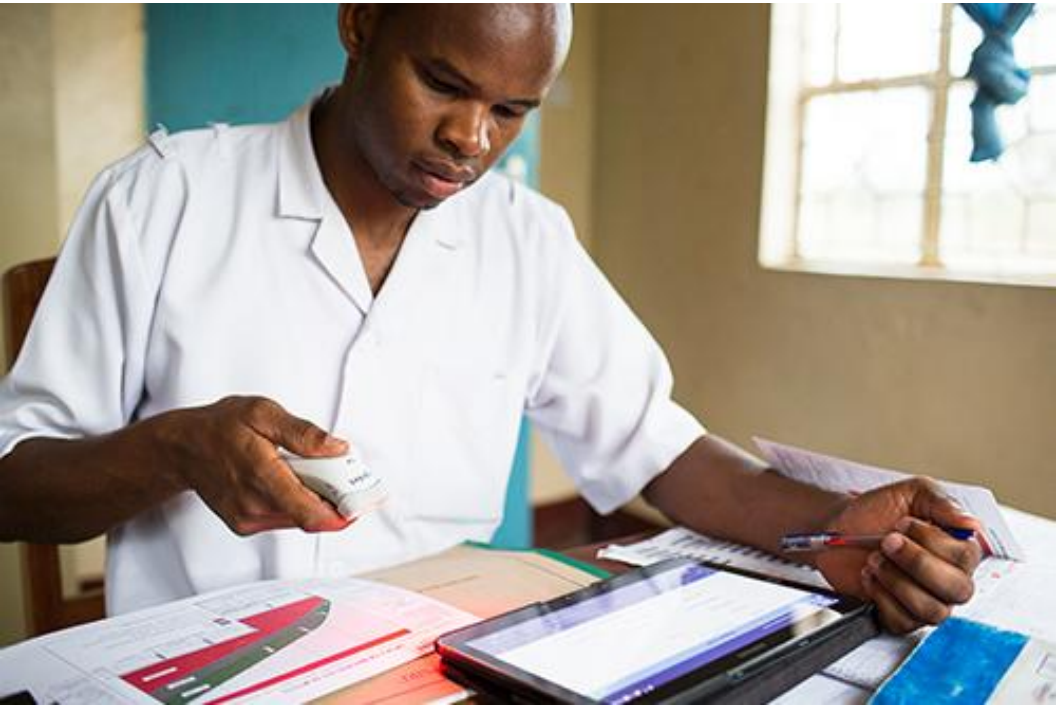
Improve Supply Chain with LMIS

Phase in Digital Systems

Interconnected Strategies Get Better Results

- Data use improved with the use of a comprehensive set of interconnected and mutually reinforcing strategies that addressed barriers to data use.
- Successful packages included strategies that addressed:
  - Skill and capacity building
  - Behavior change management
  - User-centered design principles
  - Integrating data use
  - Consideration for human resource capacity gaps
  - Measures to address workload increases
  - Mechanisms for increasing collaboration
  - Structured approaches to problem solving and decision making
  - Long-term resource commitments

Data Use Leads to Better Data



- The relationship between data quality and its use is dynamic and cyclical.
- The more data is used, the more its quality improves, and as data quality improves, health care workers are more confident about using it to guide their actions.
- There is a missed opportunity for strengthening data use at the facility level, where emphasis has been narrowly focused on data quality.

Systemizing Data Use Leads to Long-Term Success

Interventions are more likely to be successful long term if they institutionalize data use through:

- Dedicated staff positions for data management
- Routine data review meetings
- Training and guidelines for front-line staff

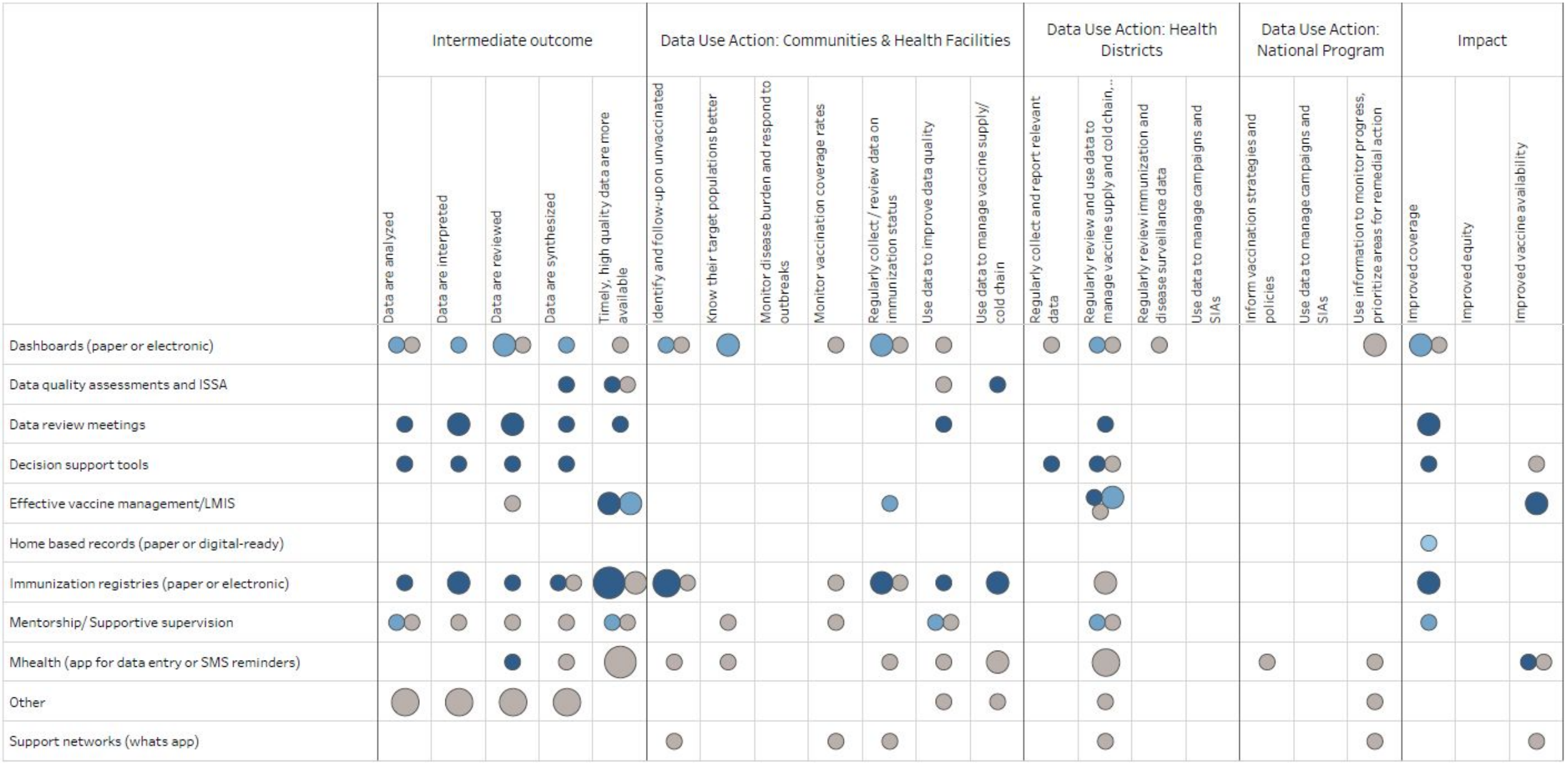
HMIS & LMIS Increase Availability of Quality Data

- Digital systems such as health management information systems (HMIS) and computerized logistics management information systems (LMIS) have made higher-quality data more available to decision-makers in real-time.
- Even greater gains in data use are achieved when digital systems are paired with other activities that reinforce data use.

Digital Systems Show Promise but Barriers Still Exist

- Although the transition from paper to digital systems has made higher-quality data more available, it has not automatically translated into greater data use.
- There is more success at the district level or higher because of fewer operational challenges than at the facility level.
- This finding points to the need for a phased approach, ensuring data use infrastructure, human resource capacity and skill building are in place before a full digital transition.

Immunization Data: Evidence for Action (IDEA) Gap Map



Questions?

For more information contact:

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Photo credit: PAHO/WHO