Measuring effective coverage and quality of care to improve the health of women, children, and adolescents in low and middle income countries

7th Global Symposium on Health Systems Research
1 November 2022
Welcome & Introduction
Session Overview

- Effective Coverage Methods
- Family Planning Linking Analysis
- Integrated Management of Childhood Illness Linking Analysis
- Questions & Answers
- Coffee break
- Small group session
- Small group share back
- Panel discussion
- Closing

NOTE FOR VIRTUAL PARTICIPANTS:
Please send your questions for speakers and panelists in the question feature on the PheedLoop App
Housekeeping

- Hybrid section, so use the microphone for those on zoom to hear you
- We want to hear from you so have reserved a Q&A after the series of presentations
- If on zoom, you may use the chat for questions
- On zoom, please mute your microphone
Countdown to 2030
Women’s Children’s & Adolescent’s Health

MISSION
Provide evidence for advocacy, planning and accountability to enhance RMNCAH & nutrition: global, regional, country
Strengthen analytical capacity in countries
Focus: coverage, equity and drivers, and “let the data speak”
History of Improve

- Child Health Epidemiology Reference Group (CHERG MA 13)

https://improvecoveragemeasurement.com/
Countdown monitors coverage of interventions across the Continuum of Care in LMICs

Many coverage measures don’t account for the quality of interventions or program received and overestimate the expected health gain.

Hence the need for Effective Coverage measures.

Source: Every Woman Every Child. Progress report 2022
The coverage cascade helps understand the loss of coverage at each step:

- **Population in need**
  - Limited availability / access / acceptability
  - Lack of awareness
  - Lack of service readiness
  - Missed opportunity
  - Inadequate service process
  - Inadequate use
  - Intervention efficacy loss
  - Health gain achieved

- **Target population**
- **Service contact**
- **Likelihood of service**
- **Crude coverage**
- **Quality-adjusted coverage**
- **User-adjusted coverage**
- **Outcome-adjusted coverage**
Melinda Munos
Johns Hopkins Bloomberg School of Public Health
Introduction

• Intervention coverage measures are widely used for prioritization, planning, and evaluation at global, national, and sub-national levels.

• Household surveys are the primary source of data on intervention coverage.

• Service quality is not captured in a HH survey nor in traditional measures of intervention coverage.

• Effective coverage (quality-adjusted coverage) aims to incorporate quality into measures of coverage to better understand whether individuals are receiving services with sufficient quality to see a health gain.
Input- and quality-adjusted coverage take advantage of the strengths of household and facility data

• Household surveys
  • Provide reasonably valid, population-based estimates of whether care was sought, and the type of facility visited
  • Allow for equity analyses

• Facility data
  • Provide information on facility readiness, and in some cases service provision and experience of care

Input- and quality-adjusted coverage are typically estimated by “linking” household and health facility data.

Approaches to linking household and health facility data

Exact-match linking

Each care-seeking episode in a household survey is linked to information about the quality of care of the specific facility(ies) visited during that episode.

Ecological linking

Each care-seeking episode in a household survey is linked to an average quality of care score of the facilities within certain administrative or geographical boundaries, or the quality score of the nearest facility(ies).

Methods questions

1. How to link household and health facility data to obtain valid estimates?

2. How should we define facility readiness and quality of service provision?
How to link household and health facility data

- 2 studies in Côte d’Ivoire and Zambia, plus the EQUIP study in Uganda compared different ecological linking methods to exact match linking

- Ecological linking can approximate exact match linking if we account for facility type
  - Caveats: Sampling, non-facility providers


Willey et al. Linking data sources for measurement of effective coverage in maternal, newborn and child health: what do we learn from individual vs ecological linking methods? *J Glob Health* 2018; 8(1): 010601
What is the effect of facility sampling (vs. census) on validity of quality-adjusted coverage?

- In Côte d’Ivoire, compared EC estimates using true source of care, ecological linking with facility census, and ecological linking with simulated samples of HFs.
- No significant difference between quality-adjusted estimates generated using a sample of facilities vs a census of facilities.
- However, when we simulated preferential care-seeking, quality-adjusted estimates based on a sample tended to under-estimate exact-match estimates and started falling outside the confidence bounds for the exact match estimates, particularly for nearest-provider linking methods.
Non-facility providers (e.g., CHWs) are typically not included in HFAs and may or may not be represented in HMIS, depending on the context.

The impact of excluding non-facility providers depends on context.

In Zambia, where CHWs represent an important source of care for sick children, conducting the linking analysis without accounting for care-seeking from CHWs under-estimated quality-adjusted coverage by 9 to 22 percentage points.

In Côte d’Ivoire, where CHWs were not an important source of care, no effect from excluding CHWs.


How accurate is geographical linking when true location of household is unknown?

- In Zambia, compared EC estimates generated by linking using geographic proximity from household location vs simulated cluster/EA location.

- Imprecise HH location and choice of linking method can bias estimates if high variability in quality or preferential care-seeking.

Defining service readiness and quality

- Limited guidance on summary measures of readiness and quality.
- Needed a process to develop summary measures of readiness and quality from available data.
- Four step process for each service area:
  1. Identified globally recommended interventions.
  2. Extracted facility readiness and provision of care items from intervention-specific clinical and service implementation guidelines.
  3. Mapped the identified items from the guidance documents to available data in health facility surveys.
  4. Developed indices informed by QoC frameworks, clinical guidelines, and data availability.
- This process highlighted data gaps in particular service areas (nutrition, newborn) and domains (skilled, motivated staff).

How do readiness and quality relate? (Is readiness a proxy for quality?)

- Readiness is easier to measure in an HFA, and more common than provision of care/service quality.
- We examined the association between readiness and quality within ANC and sick child care in 5 countries, adjusting for facility-, provider-, and patient-level factors.
- **Significant but limited association** between readiness and quality.
  - For every 10 percentage point increase in ANC readiness, 0.6 to 2.5 percentage point increase in quality.
  - For every 10 percentage point increase in sick child readiness, 0.7 to 1.2 percentage point increase in quality.
  - Readiness explains ~10% of variation in quality for sick child care.
  - For ANC, evidence of a minimum threshold of facility inputs required for health care workers to deliver high quality services.
Recommendations for linking household and facility data (1)

• Recommend using ecological linking by stratum
  • Performed consistently well, easy to implement consistently, and not affected by displacement of HH survey clusters.
  • Define strata based on facility type, managing authority, and administrative area (i.e., region / district)
    • E.g., a woman who reported receiving ANC from a public first level facility in Sylhet division (Bangladesh) would be linked to an average readiness score calculated across all public first-level facilities in Sylhet.
  • Use finest available strata in order to link care-seeking episodes to facilities that are similar to the one visited.

• Decisions about how to handle care-seeking from non-facility providers are context-specific and should be based on the utilization and service quality of these providers in your context.
• Where possible, weight quality scores by facility caseload.
• Readiness and quality (service provision) are complex constructs not usually summarized in a single measure. Development of summary measures needs to account for this complexity.
• EC measures should specify whether they are readiness-adjusted or quality-adjusted.
• While readiness is important in itself, readiness alone cannot tell us whether service quality is likely to be high.
• Efforts are needed to address data gaps in service readiness and quality, particularly for service quality; nutrition and newborn health services; and in the human resources domain.


Speakers

Elizabeth Hazel
Johns Hopkins Bloomberg School of Public Health

Abdoulaye Maïga
Johns Hopkins Bloomberg School of Public Health

Rose Muthee
Ministry of Health, Kenya

Helen Kiarie
Ministry of Health, Kenya
Effective coverage:
Contraceptive care in Kenya
Coverage Cascade

- Population in need
  - Limited availability / access / acceptability
    - Lack of awareness
  - Visits health service
    - Lack of service readiness
  - Visits health service that is “ready”
    - Missed opportunity
    - Inadequate service process
    - Inadequate use
  - Receives health service
    - Receives health service according to standards
  - User adherence
  - Health gain achieved

- Target
- Service
- Likelihood
- Crude
- Quality-adjusted
- User-adjusted
- Outcome-adjusted
<table>
<thead>
<tr>
<th>Indicator type</th>
<th>Indicator for effective coverage of contraceptive services</th>
</tr>
</thead>
</table>
| **Target population**          | - Women with mistimed pregnancy/birth in the previous two years; OR  
|                                | - Wants to limit or delay childbirth for the next 2 or more years; OR  
|                                | - Currently using any contraceptive                         |
| **Service contact**            | - Currently using a modern method OR;                      
|                                | - Was met by health worker discussed FP in previous 12 months |
| **Likelihood of service**      | *Not relevant for use/contact crude indicators*            |
| **Crude coverage**             | Currently using modern contraceptives obtained from any source (health facility, shops, private pharmacy, etc) |
| **Crude coverage, facility-based** | Currently using modern contraceptives obtained from facility |
| **Quality coverage**           | Currently using contraceptives source from health facility equipped to provide contraceptive services and received contraceptives with complete counseling |
| **User adherence**             | *Contraceptive continuation: difficult to link in cross-sectional survey* |
| **Outcome**                    | *Same as above*                                            |
Kenya

- 2018 HFA and 2014 DHS
  - Process quality not available in 2018 HFA
- Using facility type, managing authority and geographic area as the unit of linking between DHS and HFA.
- Examine crude, readiness and quality adjusted coverage indicators.
# Service readiness information in the HFA 2018

<table>
<thead>
<tr>
<th>Readiness score</th>
<th>Availability</th>
<th>Facility provides/refers for all modern methods: pills, injectables, implants, condoms, IUD, ECPs, sterilization and SDM.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff and guidelines</strong></td>
<td>Guidelines on FP</td>
<td><em>N/A</em></td>
</tr>
<tr>
<td></td>
<td>FP checklists or job aids</td>
<td><em>N/A</em></td>
</tr>
<tr>
<td></td>
<td>Staff trained in FP</td>
<td><em>N/A</em></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
<td>BP cuff</td>
<td>BP cuff observed/functioning anywhere in facility</td>
</tr>
<tr>
<td><strong>Medicine and Commodities</strong></td>
<td>COC stocks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Progestin OC</td>
<td>At least 1 valid dose observed available on the day of assessment</td>
</tr>
<tr>
<td></td>
<td>Injectable contraceptives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Condoms</td>
<td></td>
</tr>
</tbody>
</table>
Service readiness component scores

- Total score: 0.7
- Availability of modern methods: 0.6
- Funx BP cuff anywhere in clinic: 0.9
- All four stocked: 0.5
- COC stocked/valid: 0.7
- Prog only pill stocked/valid: 0.6
- 3m injectable stocked/valid: 0.7
- Male condom stocked/valid: 0.8
## Linking DHS & HFA: facility type and managing authority

<table>
<thead>
<tr>
<th>DHS 2014 – FP source</th>
<th>HFA 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government hospital</td>
<td>Public hospital</td>
</tr>
<tr>
<td>Government health center</td>
<td>Public center</td>
</tr>
<tr>
<td>Government dispensary</td>
<td>Public clinic</td>
</tr>
<tr>
<td>Other public sector</td>
<td>Public clinic</td>
</tr>
<tr>
<td>Private hospital, clinic</td>
<td>Private clinic/hospital</td>
</tr>
<tr>
<td>Nursing/maternity home</td>
<td>Mission clinic</td>
</tr>
<tr>
<td>Faith based, church, mission hospital</td>
<td>Mission hospital</td>
</tr>
<tr>
<td>Family options/fhok clinic</td>
<td>Mission clinic</td>
</tr>
<tr>
<td>Mobile clinic</td>
<td>Public clinic</td>
</tr>
<tr>
<td>Community-based distributor</td>
<td>Public clinic</td>
</tr>
<tr>
<td>Community health worker</td>
<td>Public clinic</td>
</tr>
<tr>
<td>Shop, friend, Other private, pharmacist</td>
<td>Assume quality=0</td>
</tr>
</tbody>
</table>
Defined linking units

Readiness score by linking unit

<table>
<thead>
<tr>
<th>Linking Unit</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban, public hosp</td>
<td>0.81</td>
</tr>
<tr>
<td>Urban, public center</td>
<td>0.74</td>
</tr>
<tr>
<td>Urban, public clinic</td>
<td>0.68</td>
</tr>
<tr>
<td>Urban, mission all</td>
<td>0.67</td>
</tr>
<tr>
<td>Urban, private all</td>
<td>0.64</td>
</tr>
<tr>
<td>Rural, public hosp</td>
<td>0.75</td>
</tr>
<tr>
<td>Rural, public center</td>
<td>0.67</td>
</tr>
<tr>
<td>Rural, public clinic</td>
<td>0.65</td>
</tr>
<tr>
<td>Rural, mission all</td>
<td>0.59</td>
</tr>
<tr>
<td>Rural, private all</td>
<td>0.64</td>
</tr>
<tr>
<td>Nairobi, non-private all</td>
<td>0.79</td>
</tr>
<tr>
<td>Nairobi, private all</td>
<td>0.80</td>
</tr>
</tbody>
</table>

- Collapsed all private-for-profit facilities into one category to match DHS
- Collapsed units if less than 20 facilities per unit
  - All Nairobi non-private
  - Rural Mission hospital/center
  - Urban mission, all facilities
Contraceptive method use and source for modern method (K-DHS 2014)

Source for modern method, current use

- Injections: 44%
- Implants/Norplant: 17%
- Pill: 13%
- Condom (male): 8%
- Traditional: 8%
- Sterilization: 5%
- IUD: 5%

- Nairobi, private all: 5%
- Nairobi, non-private all: 6%
- Rural, private all: 12%
- Rural, mission clinic: 0%
- Rural, mission hosp/center: 1%
- Rural, public clinic: 23%
- Rural, public center: 12%
- Rural, public hosp: 10%
- Urban, private all: 10%
- Urban, mission all: 1%
- Urban, public clinic: 5%
- Urban, public center: 4%
- Urban, public hosp: 10%
Contact with services
- Currently using a modern method OR;
- Was met by a health worker at facility for other care or field worker who mentioned FP in previous 12 months

Crude coverage
- Demand for FP satisfied using a modern contraceptive, any source

Crude coverage, facility source
- Demand for FP satisfied using a modern contraceptive, sourced at a health facility (excludes private pharmacy, shops, etc).

Quality-adjusted coverage:
- Currently using modern contraceptives obtained at health facility equipped to provide contraceptive services

Note: where process quality is available, we would continue with quality coverage
Cascade by geographic area

- Contact with services
- Crude coverage (mDFPS)
- mDFPS, sourced at HF
- Readiness-adjusted mDFPS

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
<th>Nairobi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion</td>
<td>78</td>
<td>84</td>
<td>82</td>
</tr>
<tr>
<td>Crude coverage (mDFPS)</td>
<td>71</td>
<td>78</td>
<td>82</td>
</tr>
<tr>
<td>mDFPS, sourced at HF</td>
<td>63</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>Readiness-adjusted mDFPS</td>
<td>37</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
Cascade by women’s age

Contact with services  Crude coverage (mDFPS)  mDFPS, sourced at HF  Readiness-adjusted mDFPS

<table>
<thead>
<tr>
<th>Women age</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-17</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
<tr>
<td>18-24</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>36</td>
</tr>
<tr>
<td>25-34</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>47</td>
</tr>
<tr>
<td>35-49</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>
Cascade by household wealth

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Poorest households</th>
<th>Wealthiest households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with services</td>
<td>64</td>
<td>84</td>
</tr>
<tr>
<td>Crude coverage (mDFPS)</td>
<td>51</td>
<td>81</td>
</tr>
<tr>
<td>mDFPS, sourced at HF</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>Readiness-adjusted mDFPS</td>
<td>35</td>
<td>39</td>
</tr>
</tbody>
</table>
• Differences in readiness scores by facility type, managing authority and geographic areas.

• Nationally, there were two coverage cascade declines
  74% -> 63%, indicating those women are accessing contraceptives through private pharmacies, shops or another informal sector source.
  63% - 42% indicating women are accessing health facilities with low readiness for contraceptive care. They are still able to access but these facilities have lower method availability and inconsistent stocks.

• Lower readiness in rural areas compared to urban and major metropolitan areas.

• Poorer readiness-adjusted quality for younger women and adolescents also are accessing contraceptives from the informal sector.

• Poorer women have less contact with services, lower demand satisfied, and lower sourcing from health facilities compared to women from the wealthiest households.
Reflections

- Coverage cascade model helpful to understand gaps in access, coverage and quality.

- Assumes facility readiness is linked with quality of services
  - Continual stocks is a proxy that facility is well-managed and organized
  - Better method availability enables women’s agency in method choice.

- Can explore other readiness score formulas and determine link with quality of care.
Effective coverage of integrated management of childhood illness (IMCI): Readiness- and process quality-adjusted coverage

Tanzania case study
Objectives

- To calculate health facility readiness in providing integrated management of childhood illnesses (IMCI) service
- To calculate the quality of IMCI intervention according to standard protocols
- To compute IMCI effective coverage cascades accounting for quality of care
### Sick child coverage cascades indicators

<table>
<thead>
<tr>
<th>Cascade level</th>
<th>Diarrhea</th>
<th>Fever</th>
<th>Pneumonia</th>
<th>IMCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in need</td>
<td>Child had diarrhea</td>
<td>Child had fever</td>
<td>Child had symptoms of pneumonia</td>
<td>Child had diarrhea, fever or symptoms of pneumonia</td>
</tr>
<tr>
<td>Care-seeking (any)</td>
<td>Care sought from any sources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service contact (health facility or provider)</td>
<td>Care sought from a health facility or provider</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood of service readiness</td>
<td>Care sought from provider ready to manage illness in line with IMCI guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude coverage of intervention</td>
<td>ORS</td>
<td>Any ACT, antimalarial/malaria test</td>
<td>Service contact</td>
<td>ORS, antimalarial, service contact ARI</td>
</tr>
<tr>
<td>Quality-adjusted coverage</td>
<td>Intervention delivered according to standards</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Child illness and care seeking

Child illness

Sources of IMCI careseeking

Diarrhea | Fever | ARI | IMCI (Diarrhea, fever, ARI) |
---|---|---|---|
12 | 18 | 4 | 26 |

Public hospital | Public health center | Private hospital | Private health center | Pharmacy/depot | CHW/spec. voluntary | Non-specified |
---|---|---|---|---|---|---|
4 | 33 | 1 | 7 | 35 | 5 | 3 |
Sick child readiness and process quality domains
Sick child service readiness

Sick child Score - Service availability, Supplies, Diagnostics, Medicines, Training/Supervision and Readiness scores

Mean score for various components such as Service, Supplies, Diagnostics, Medicines, Training/Supervision, and Readiness by category of health facility.
Sick child service quality

Sick child Score - Health assessment, Physical exams, Counseling, Treatment and Process quality

- Health assessment
- Physical exam
- Counseling
- Treatment
- Process quality

Mean score

Component Process Quality

Public hospital
Private hospital
Public health center
Private health center
Linking analysis

Type of linking
- Linking SPA - DHS
- Ecological linking by region, type of facility and managing authority

Effective coverage adjustment
- Readiness-adjusted
- Process quality adjusted
Sick child coverage cascades

Coverage cascades - Diarrhea

Coverage cascades - Fever

Coverage cascades - Symptoms pneumonia
Sick child coverage cascades

Coverage cascades - IMCI

Coverage cascades IMCI by place of residence
In conclusion

- Availability and inclusion of various readiness and quality components in the analysis.
- Limited readiness and process quality data elements (e.g., training, supervision, counseling).
- Limitation analyzing ARI and fever/malaria quality.
- Limited data on severity of illness for classification, admissions and referrals.
- Indicators defined according to IMCI guidelines.
- High proportion of non-facility care-seeking (e.g., pharmacy, Accredited Drug Dispensing Outlets/ADDO).
- Care-seeking from multiple sources for the same episode.
- Quality discrimination of lower-level facilities.
- Large gap between crude and adjusted coverage.
- No significant difference between readiness- and process quality-adjusted coverage (fever, ARI).
Questions & Answers

Virtual Participants: Please use the question feature on the PheedLoop App
Break
Ashley Sheffel
Johns Hopkins Bloomberg School of Public Health
Small group sessions & share back
Instructions

In small groups, we are going to participate in a vignette to get us thinking about how effective coverage data may be used.

Set-up groups/Assign user roles (10min)

1. Form groups of 6-8 people
   - **In-person**: Circle up chairs with 6-8 people sitting near you. We will come around to help people find groups if needed.
   - **Virtual**: We will create break-out rooms with 6-8 randomly selected individuals.

2. Your group will be assigned a data user role. Please read your role aloud within your group to understand your assigned role and purpose as data users to help frame your thinking for this exercise.
Review data (10min)

3. Your group will now receive “new analysis” which is effective coverage data. Please as a group, look at the data, interpret the data, discuss the data, etc.

Discussion (20min)

4. Now that you have looked at the data, we are going to discuss the usefulness of the data for your specific needs as a data user.

Prepare to share (5min)

5. Take a few minutes to nominate someone willing to briefly share some of your groups’ thoughts during the plenary.
Moderated group share back
Panelists

Helen Kiarie
Ministry of Health, Kenya

Tanya Marchant
London School of Hygiene and Tropical Medicine

Lara Vaz
Population Reference Bureau (PRB)

Claire-Helene Mershon
Bill & Melinda Gates Foundation

Moderator
Agbessi Amouzou
Johns Hopkins Bloomberg School of Public Health
Panel Discussion
Thank You!

We are grateful to the Bill & Melinda Gates Foundation for funding Countdown to 2030 for Women’s Children’s and Adolescents’ Health and the Improve project.