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WELCOME

Measuring effective coverage and quality of care

Thursday, September 15th

8:30 AM – 10:00 AM EDT

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

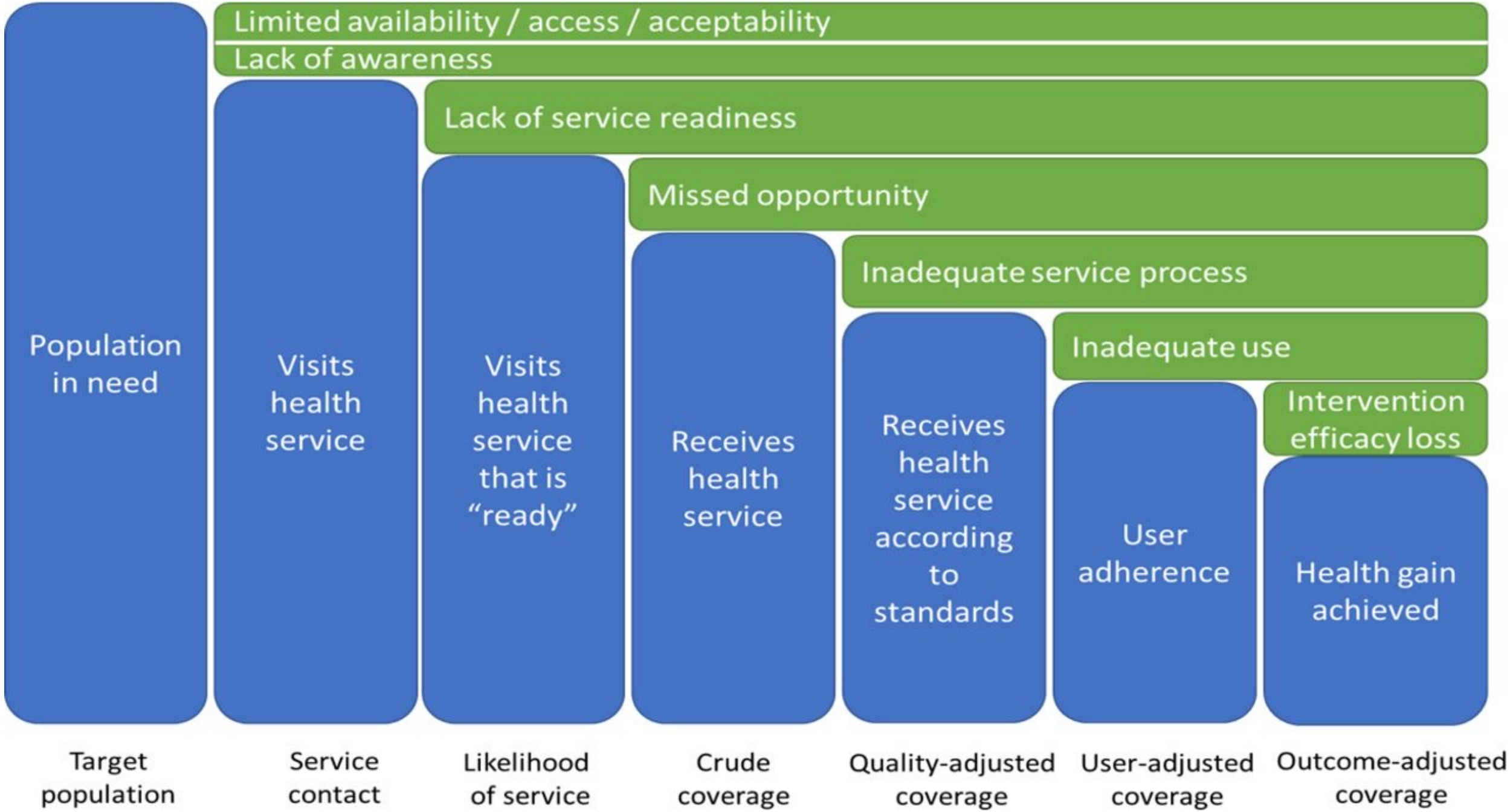
IMPROVE

Measuring effective coverage and quality of care

Melinda Munos, PhD

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



Agbessi Amouzou et al. BMJ Glob Health 2019;4:e001297

History of this collaboration

- Child Health Epidemiology Reference Group (CHERG MA 13)
- Improving Coverage Measurement (2013-2018)
- IMPROVE (2017-2022)

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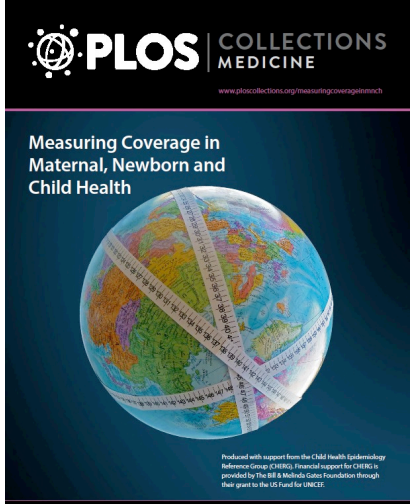
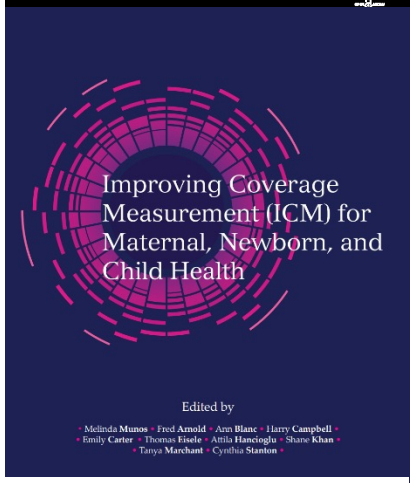
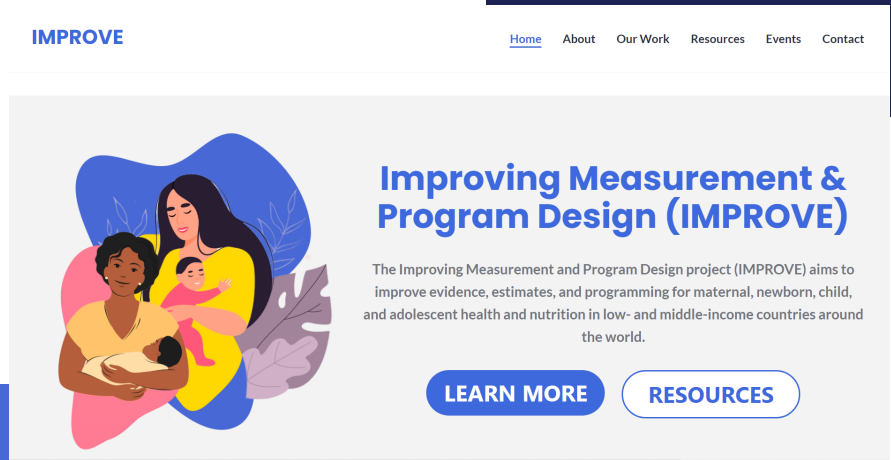






Core Group

- Fred Arnold, DHS/ICF International
- Ann Blanc, (retired) Population Council
- Harry Campbell, University of Edinburgh
- Emily Carter, CDC
- Thomas Eisele, Tulane University
- Sunny Kim, International Food Policy Research Institute
- Joanne Katz, Johns Hopkins
- Margaret Kosek, University of Virginia
- Tanya Marchant, London School of Hygiene and Tropic Medicine
- Melinda Munos, Johns Hopkins
- Jennifer Requejo, United Nations International Children's Emergency Fund
- Ashley Sheffel, Johns Hopkins
- Cindy Stanton, Stanton-Hill Research

Improve Coverage Objectives

1. Increased availability of evidence for the validity of existing and new MNCAH & Nutrition coverage indicators and questions collected through household surveys
2. Availability of evidence-based tools and protocols for routine national-level linkage of data on care-seeking from household surveys with results from service provider assessments

Webinar Outline

Time	Topic	Presenter
08:30am EDT	Welcome & Introduction	Melinda Munos
08:35-08:50am EDT	What have we learned about effective coverage methods?	Melinda Munos
08:50-09:10am EDT	Effective coverage cascades for ANC	Ashley Sheffel
09:10-09:50am EDT	Panel discussion	Moderated by Cindy Stanton Aniqa Hossain Seblewengel Lemma Tanya Marchant Jennifer Requejo
11:25-11:30am EDT	Closing	Allisyn Moran

Presenters

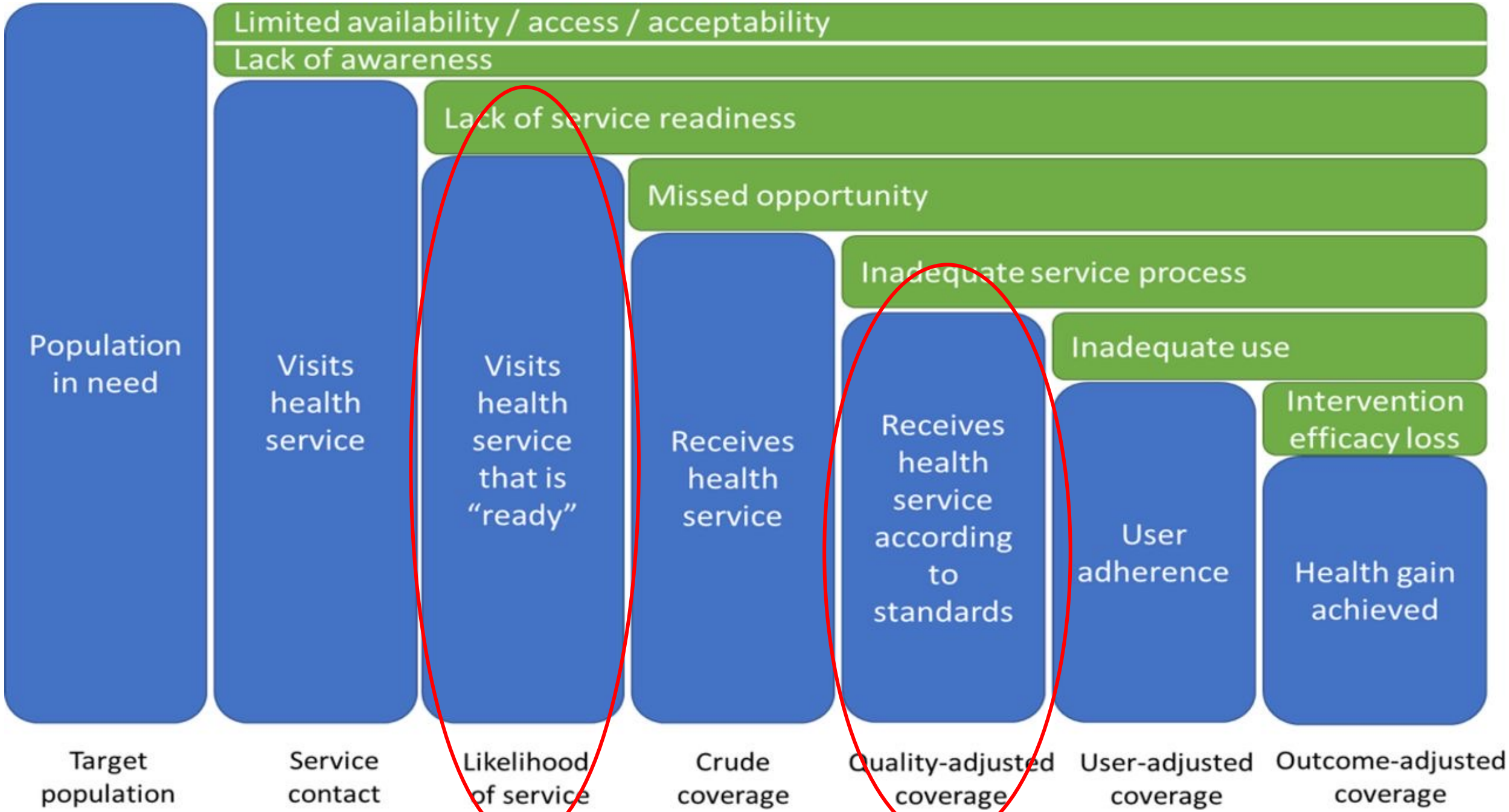
Melinda Munos
Johns Hopkins University

Ashley Sheffel
Johns Hopkins University

Moderator
Cindy Stanton
Stanton-Hill Research

What have we learned about how to estimate effective coverage?

Melinda Munos, PhD



Agbessi Amouzou et al. BMJ Glob Health 2019;4:e001297

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.

Do et al. Linking Household and Facility Data for Better Coverage Measures in Reproductive, Maternal, Newborn, and Child Health Care: A Systematic Review. *J Global Health* 2016; 6(2).

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)

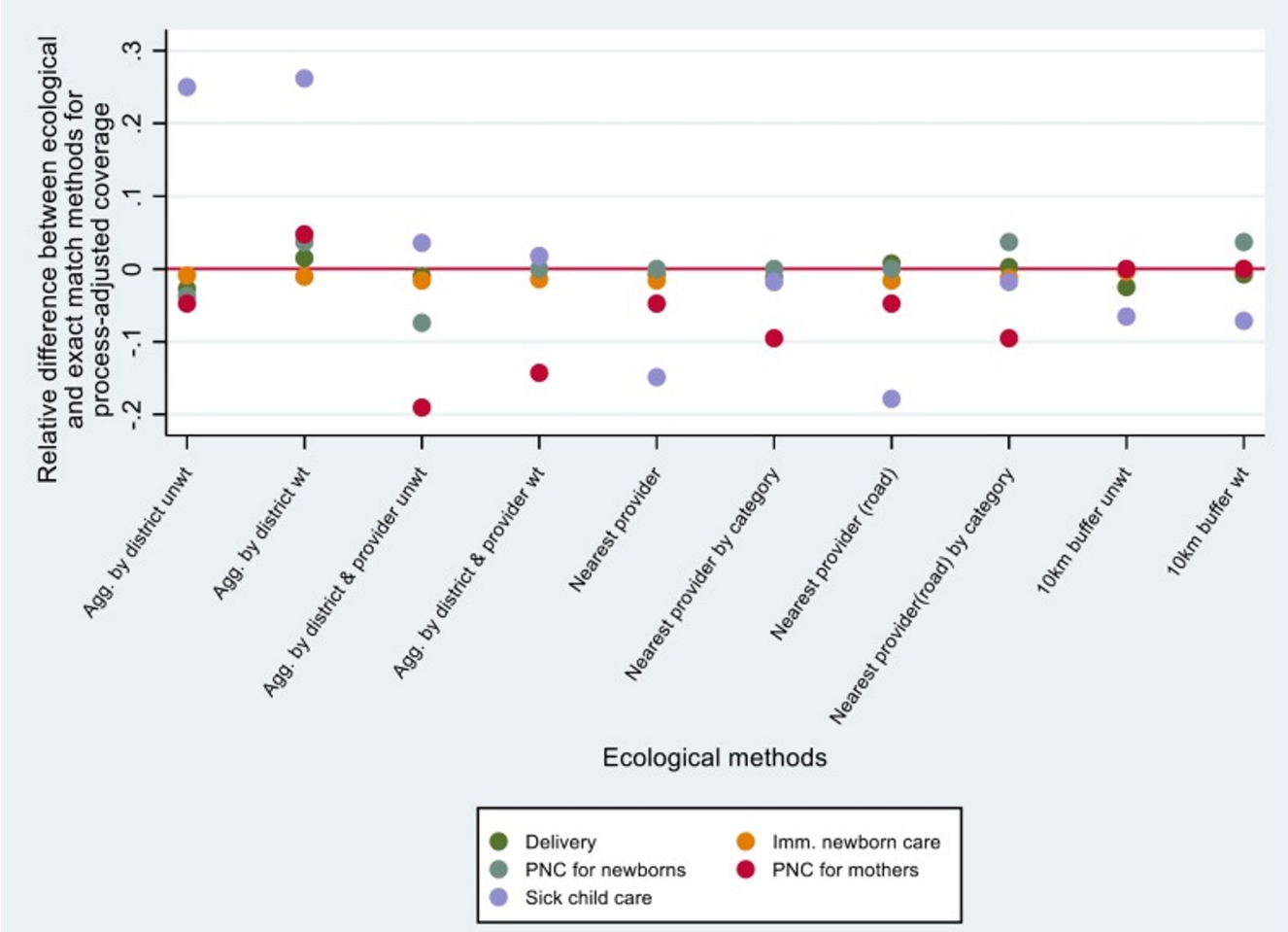
Do et al. Linking Household and Facility Data for Better Coverage Measures in Reproductive, Maternal, Newborn, and Child Health Care: A Systematic Review. *J Global Health* 2016; 6(2).

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?

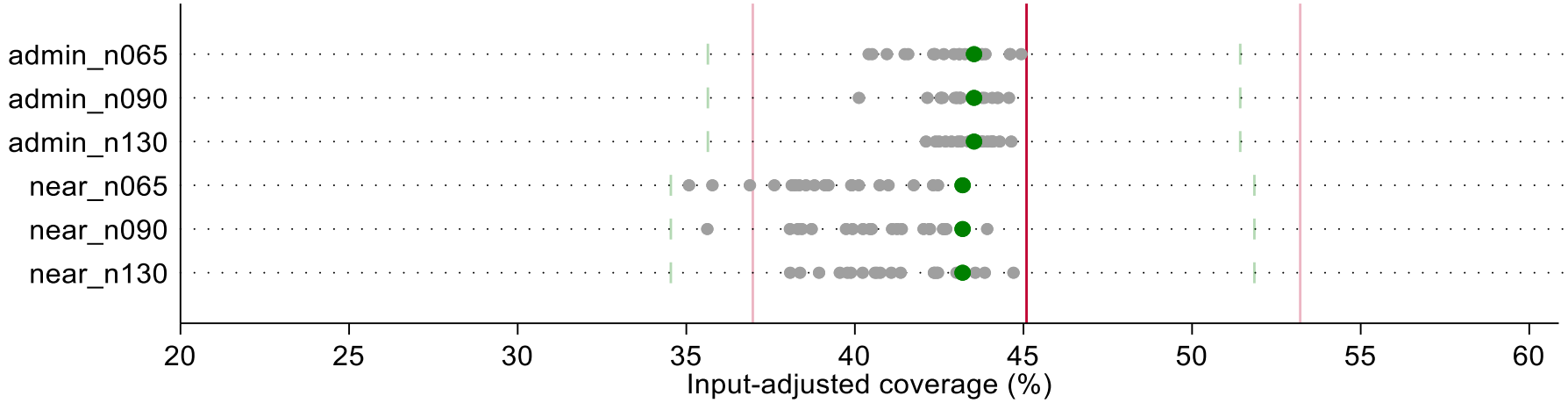
How to link household and health facility data

- 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



Munos et al. Linking household survey and health facility data for effective coverage measures: a comparison of ecological and individual linking methods using the Multiple Indicator Cluster Survey in Côte d'Ivoire. *J Glob Health* 2018; 8(2): 020803.
Carter et al. Evaluation of methods for linking household and health care provider data to estimate effective coverage of management of child illness: results of a pilot study in Southern Province, Zambia. *J Glob Health* 2018; 8(1): 010607.
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

Carter ED, Maiga A, Do M, Sika GL, Mosso R, Dosso A, Munos MK. The effect of sampling health facilities on estimates of effective coverage: a simulation study. *Int J Health Geogr.*

Non-facility providers

- 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 careseeking from CHWs under-estimated quality-adjusted coverage by 9 to 22 percentage points
- In Cote d'Ivoire, where CHWs were not an important source of care, no effect from excluding CHWs

Carter et al. Evaluation of methods for linking household and health care provider data to estimate effective coverage of management of child illness: results of a pilot study in Southern Province, Zambia. *J Glob Health* 2018; 8(1): 010607.
Munos et al. Linking household survey and health facility data for effective coverage measures: a comparison of ecological and individual linking methods using the Multiple Indicator Cluster Survey in Côte d'Ivoire. *J Glob Health* 2018; 8(2): 020803.

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)

King et al. Advancing nutrition measurement: Developing quantitative measures of nutrition service quality for pregnant women and children in low- and middle-income country health systems. *Matern Child Nutr*. 2022;18(1):e13279
Sheffel et al. Development of Summary Indices of Antenatal Care Service Quality in Haiti, Malawi, and Tanzania. *BMJ Open* 2019. 9:e032558

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
  - Adjusted effect sizes ranged from 0.06 to 0.25 for ANC and sick child care
  - 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 careseeking 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

Recommendations for linking household and facility data (2)

- 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

References

1. Carter ED, Maiga A, Do M, Sika GL, Mosso R, Dosso A, Munos MK. The effect of sampling health facilities on estimates of effective coverage: a simulation study. *Int J Health Geogr*
2. King SE, Sheffel A, Heidkamp R, Xu YY, Walton S, Munos MK. Advancing nutrition measurement: Developing quantitative measures of nutrition service quality for pregnant women and children in low- and middle-income country health systems. *Matern Child Nutr*. 2022;18(1):e13279.
3. Carter ED, Leslie HH, Marchant T, Amouzou A, Munos MK. Methodological considerations for linking household and healthcare provider data for estimating effective coverage: a systematic review. *BMJ Open*. 2021;11(8):e045704.
4. Carter ED, Munos MK. Impact of imprecise household location on effective coverage estimates generated through linking household and health provider data by geographic proximity: a simulation study. *Int J Health Geogr*. 2021;20(1):38.
5. Sheffel A, Zeger S, Heidkamp R, Munos M. Development of Summary Indices of Antenatal Care Service Quality in Haiti, Malawi, and Tanzania. *BMJ Open* 2019. 9:e032558.
6. Munos MK, Maiga A, Do M, Sika G, Carter E, Mosso R, Dosso A, Leyton A, Khan SM. Linking household survey and health facility data for effective coverage measures: a comparison of ecological and individual linking methods using the Multiple Indicator Cluster Survey in Côte d'Ivoire. *J Glob Health* 2018; 8(2): 020803.
7. Carter E, Ndhlovu M, Eisele T, Nkhama E, Katz J, Munos MK. Evaluation of methods for linking household and health care provider data to estimate effective coverage of management of child illness: results of a pilot study in Southern Province, Zambia. *J Glob Health* 2018; 8(1): 010607.
8. Willey B, Waiswa P, Kajjo D, Munos M, Akuze J, Allen E, Marchant T. 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.
9. Do M, Micah A, Brondi L, Campbell H, Marchant T, Eisele T, Munos MK. Linking Household and Facility Data for Better Coverage Measures in Reproductive, Maternal, Newborn, and Child Health Care: A Systematic Review. *J Global Health* 2016; 6(2).

Q&A

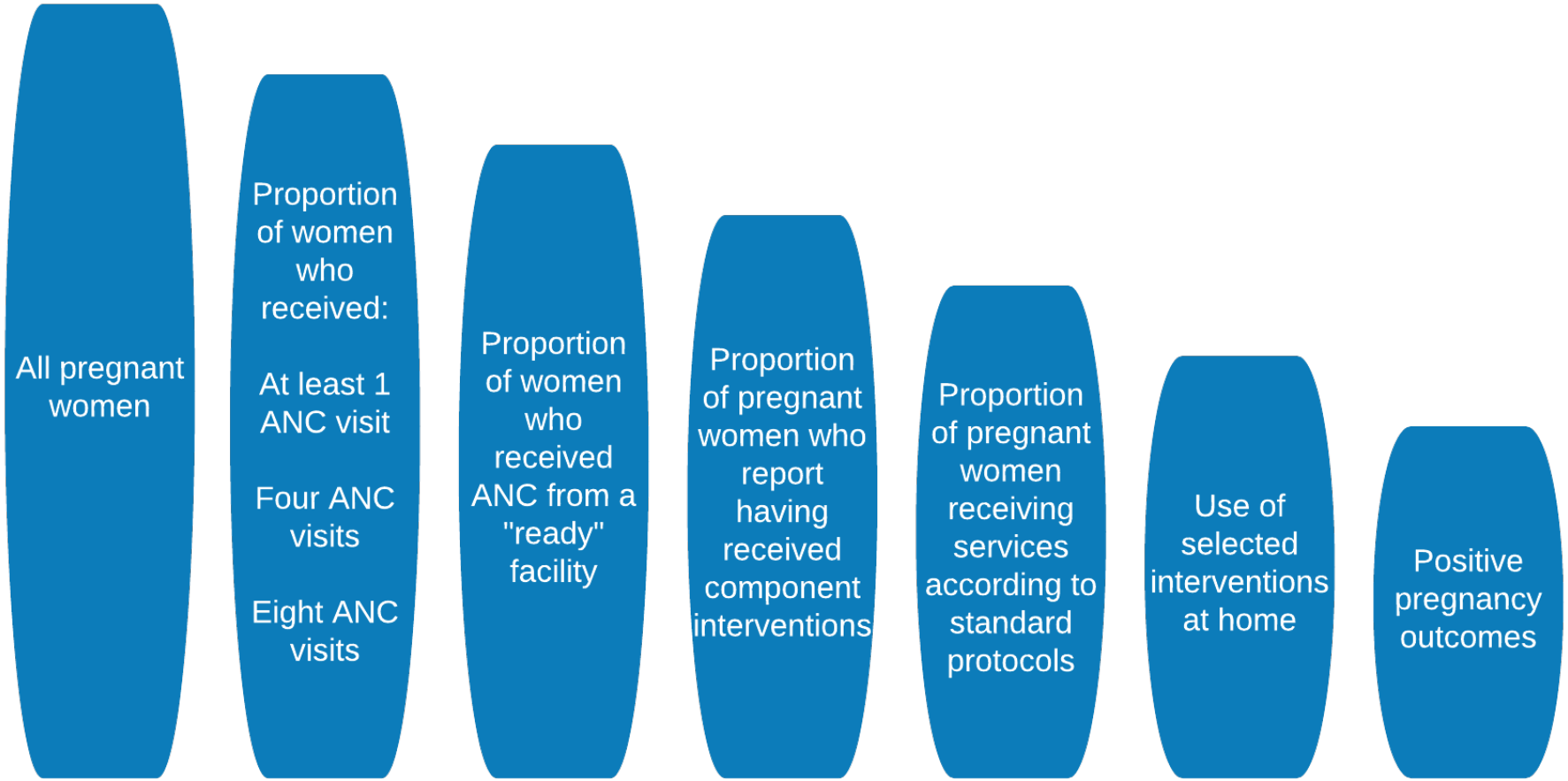
Estimating effective coverage cascades for antenatal care

Ashley Sheffel, DrPH

Operationalizing effective coverage cascades

- Developing a theoretical cascade
- Mapping data & identifying gaps
- Calculating facility readiness and provision/experience of care scores
- Estimating steps of cascade

Theoretical cascade – Antenatal care



Mapping data and identifying gaps

- In general, very few countries have recent HFAs that measure the quality of service provision
  - Even fewer have a recent HFA and HH survey (i.e. DHS) that can be linked
- No data to use for user adherence from HH or HFA surveys
- No outcome measure to assess for ANC

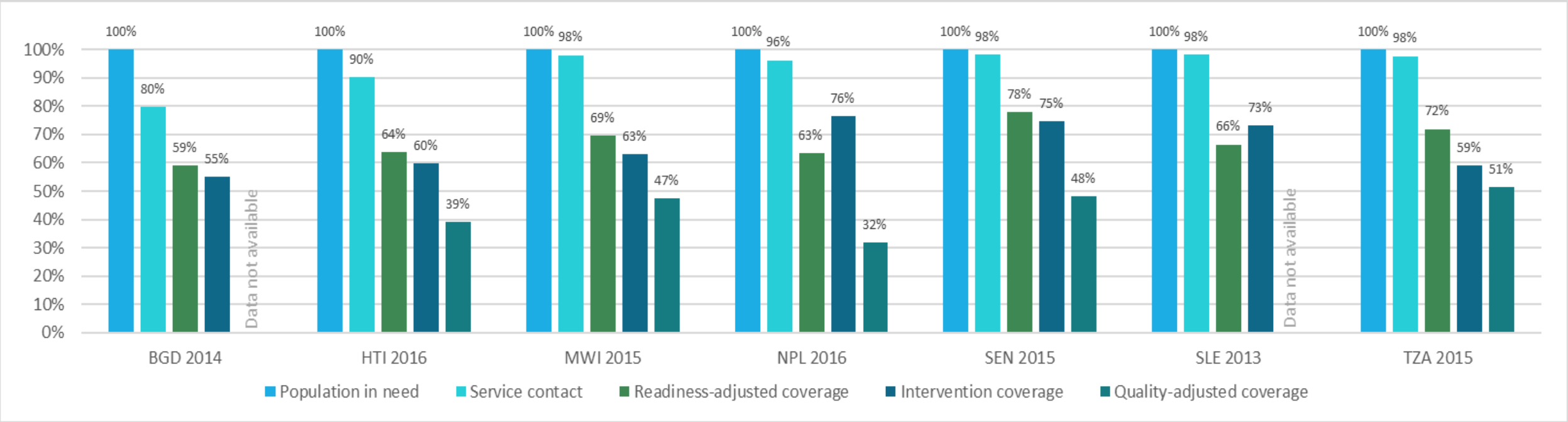
Country selection

- Selected countries where we had recent SPA/SARA data and DHS data available
  - Ideally the HFA would be two years before the HH survey for ANC
  - Need information on facility types for ecological linking, so prioritized DHS for ANC analyses
- In addition, selected countries to represent various regions of the world

Country selection and data availability for ANC EC cascades

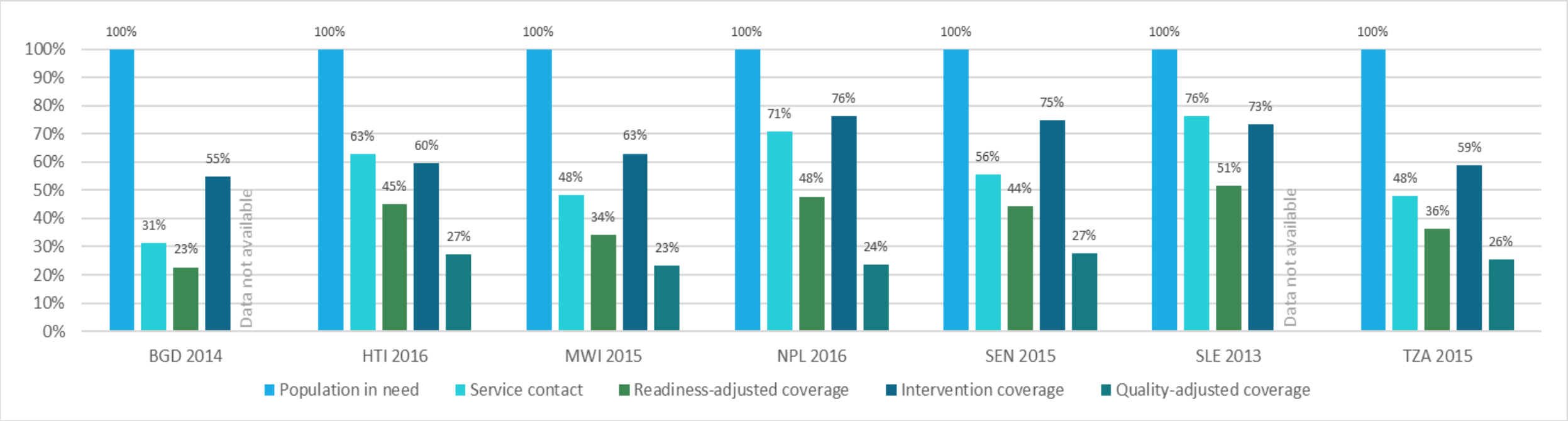
	Population in need	Service contact	Readiness-adjusted coverage	Intervention coverage	Quality-adjusted coverage	User adherence	Outcome adjusted coverage
	Women with a live birth in the last two years	Received at least 1 ANC visit	Received ANC1 from a "ready" facility	Received ANC component interventions (TT, IPTp, Iron, BP measured, Urine sample, blood sample, deworming)	Received ANC1 services according to standard protocols (includes readiness and provision of care)	Received ANC services and adhered to treatment standards	Received ANC services and experienced health gains from the service
Bangladesh							
Haiti							
Malawi							
Nepal							
Senegal							
Sierra Leone							
Tanzania							

ANC 1 cascade estimates



Women with a live birth in the last two years	Received at least 1 ANC visit	Received ANC1 from a "ready" facility	Received ANC component interventions (TT, IPTp, Iron, BP measured, Urine sample, blood sample, deworming)	Received ANC1 services according to standard protocols (includes readiness and provision of care)
Population in need	**Service contact**	**Readiness-adjusted coverage**	**Intervention coverage**	**Quality-adjusted coverage**

ANC 4 cascade estimates

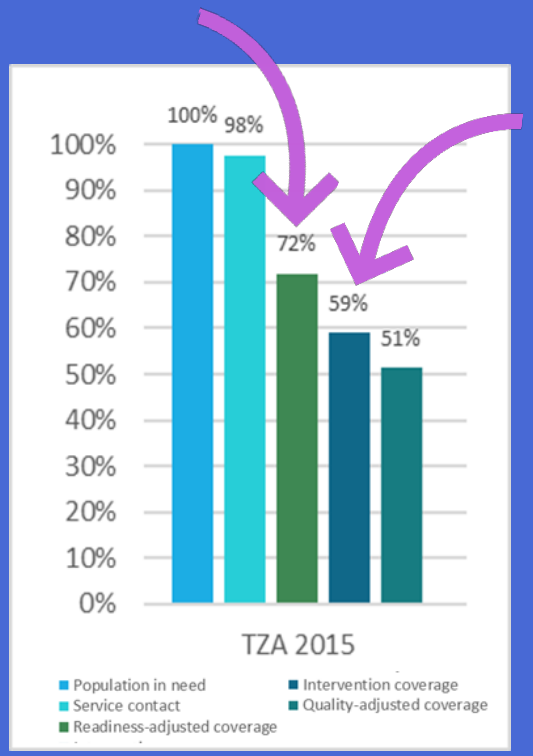


Women with a live birth in the last two years	Received at least 4 ANC visits	Received ANC4 from a "ready" facility	Received ANC component interventions (TT, IPTp, Iron, BP measured, Urine sample, blood sample, deworming)	Received ANC4 services according to standard protocols (includes readiness and provision of care)
Population in need	**Service contact**	**Readiness-adjusted coverage**	**Intervention coverage**	**Quality-adjusted coverage**

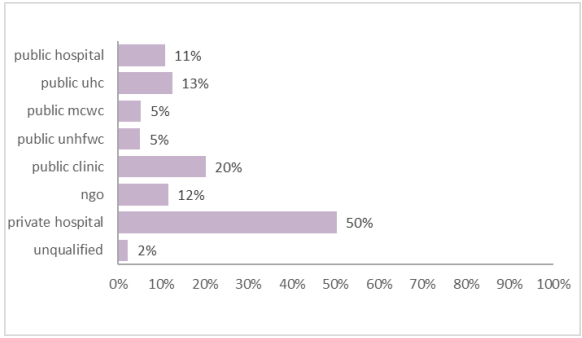
Taking a deeper dive into effective coverage estimates

- Readiness-adjusted and quality-adjusted coverage estimates are driven by **where** women seek care and the **readiness/quality** of that care
- Where people seek care is variable by country
- We see some patterns in readiness and quality by facility type/mga across countries

Variation in the source of care



Bangladesh



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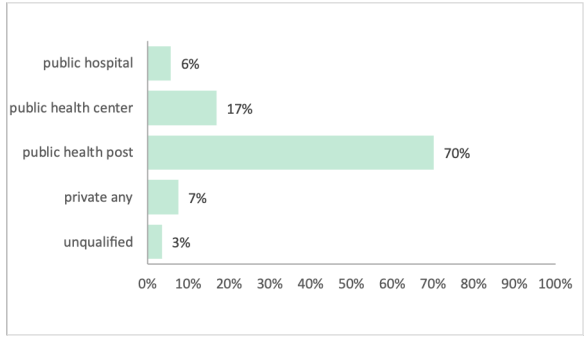
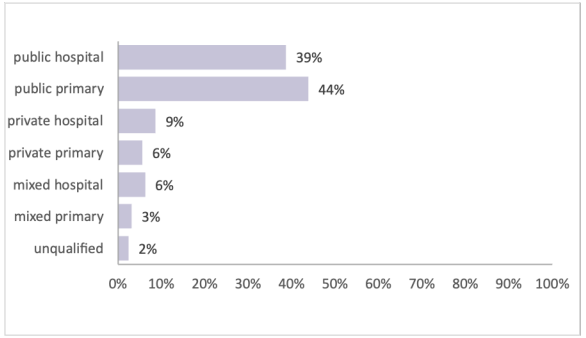
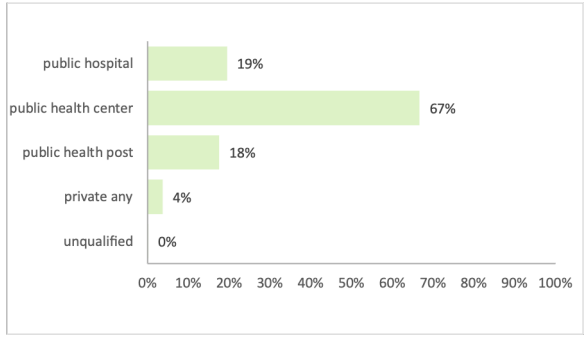


Haiti



Sierra Leone



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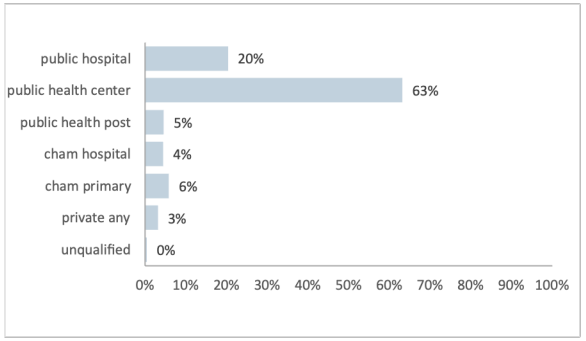
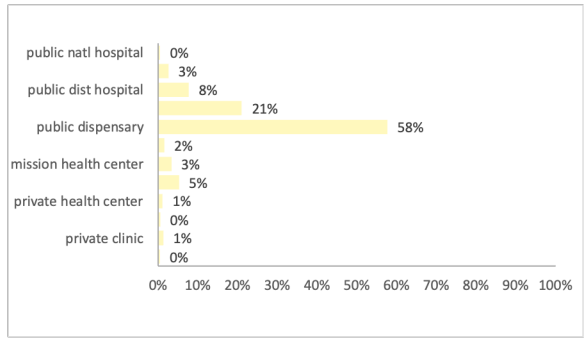


Tanzania



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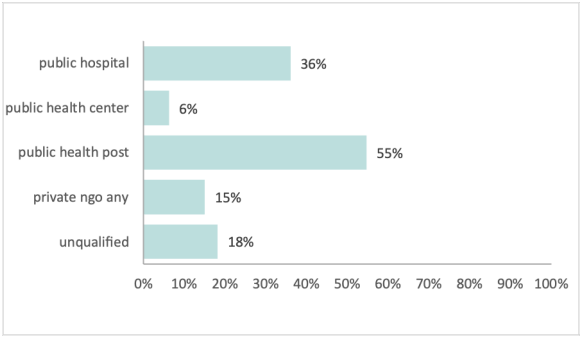
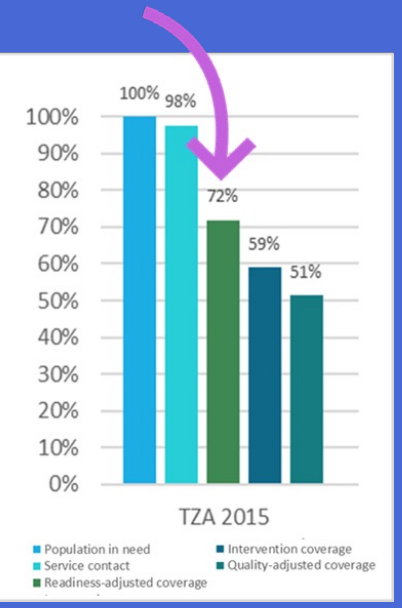
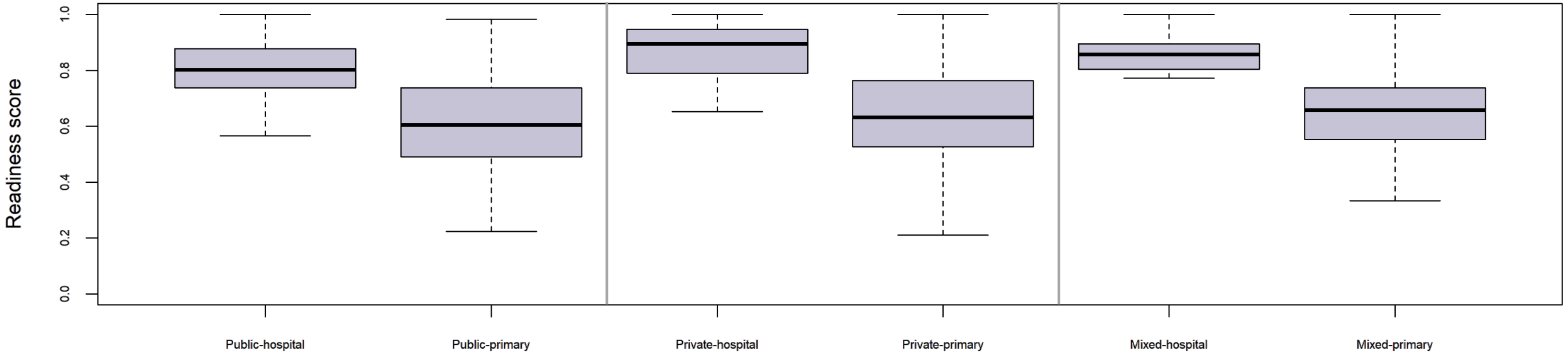


Distribution of readiness scores by facility type/mga - Haiti





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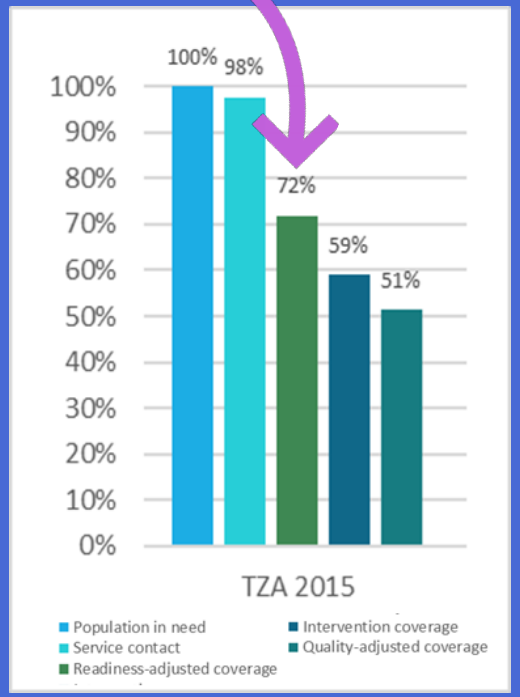
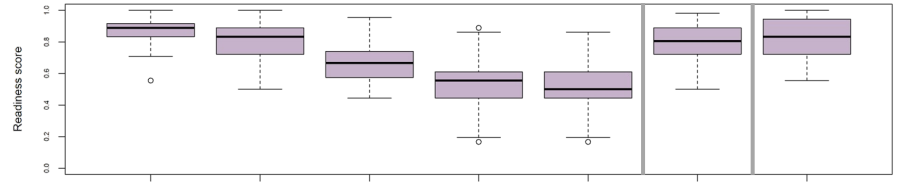
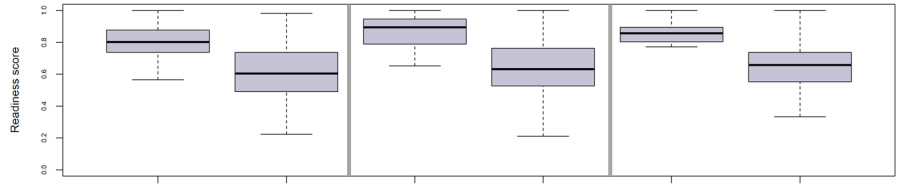


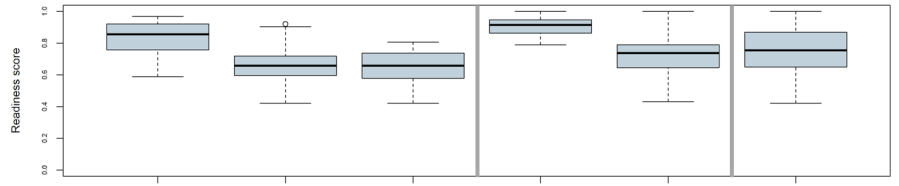
Bangladesh



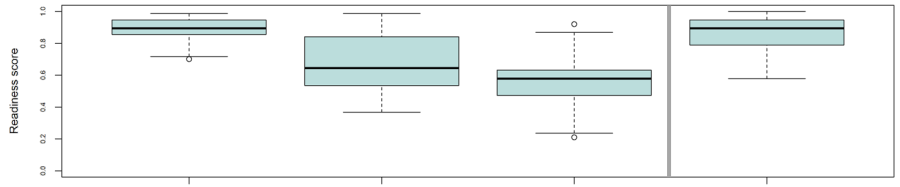
Haiti



Malawi



Nepal



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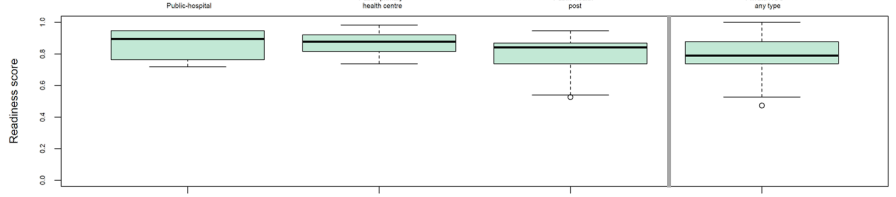

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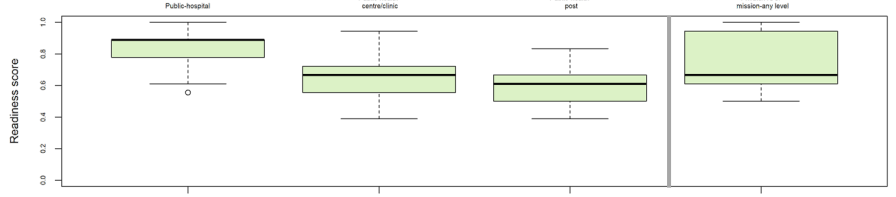
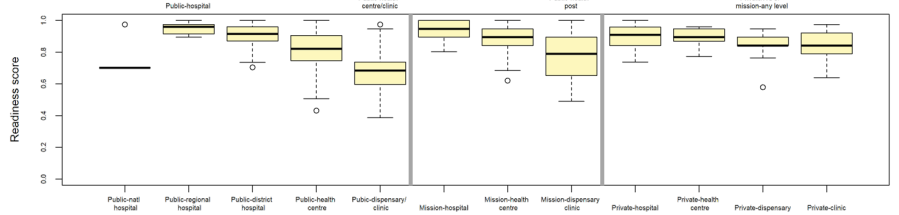
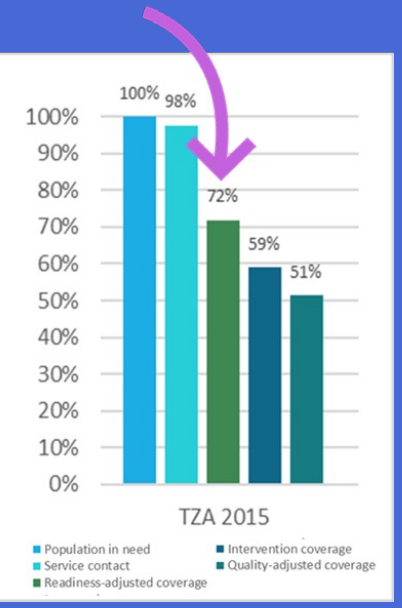
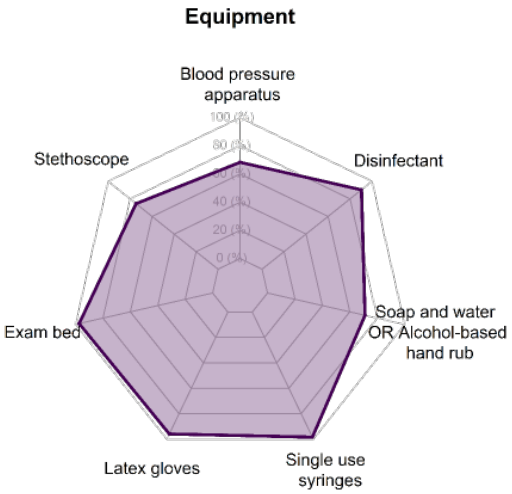


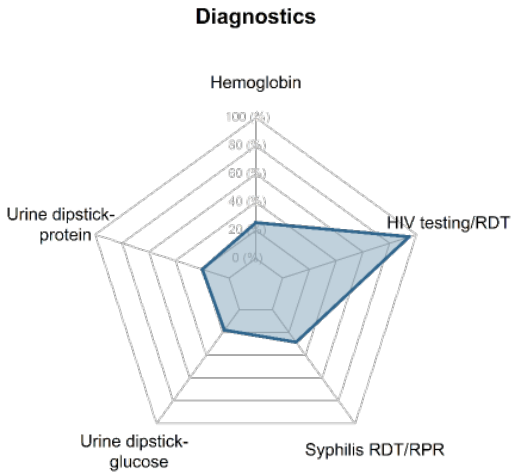
Tanzania

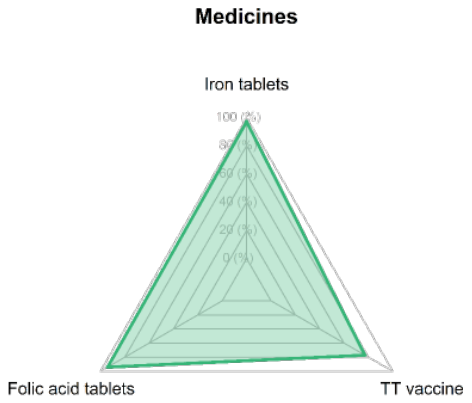


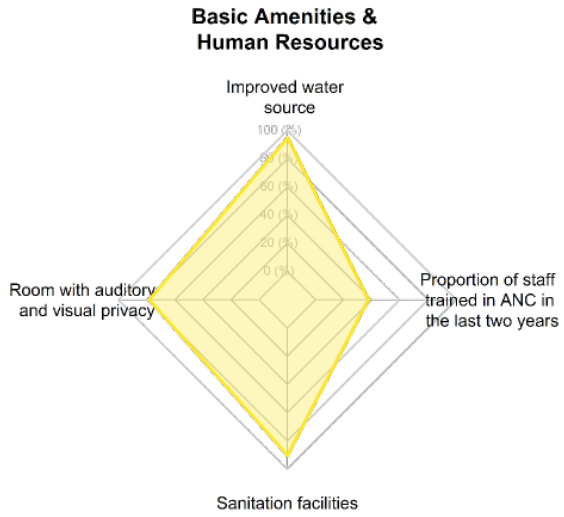
Facility readiness scores by domain- Malawi



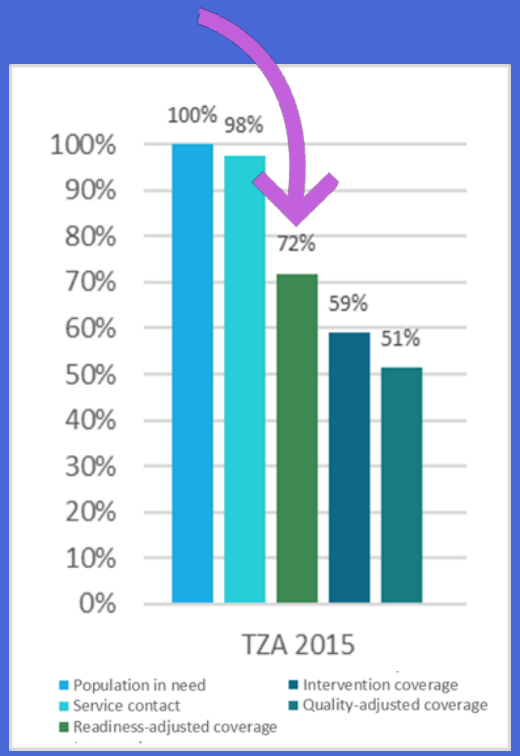




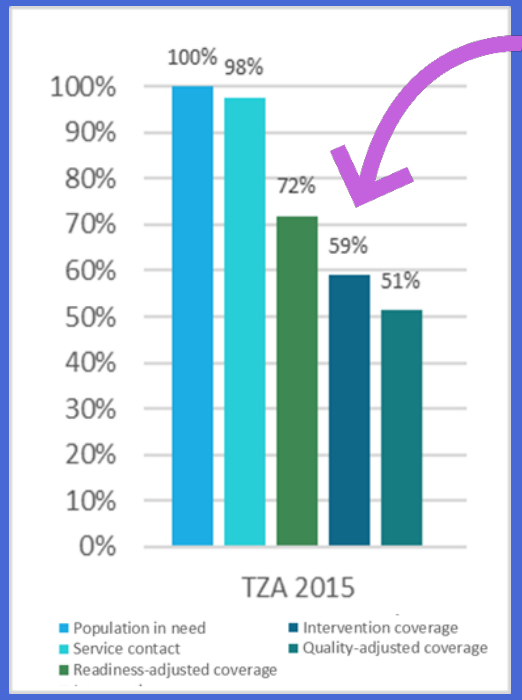




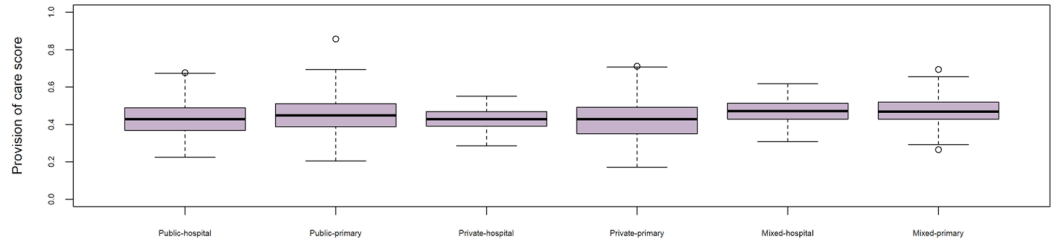
Facility readiness scores by domain



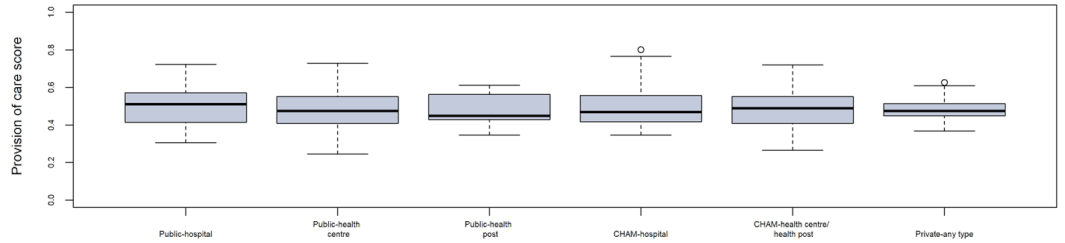
Distribution of provision/ experience of care scores by facility type/ mga



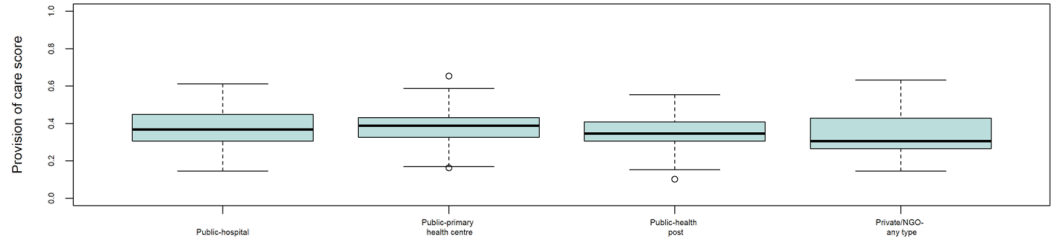
Haiti



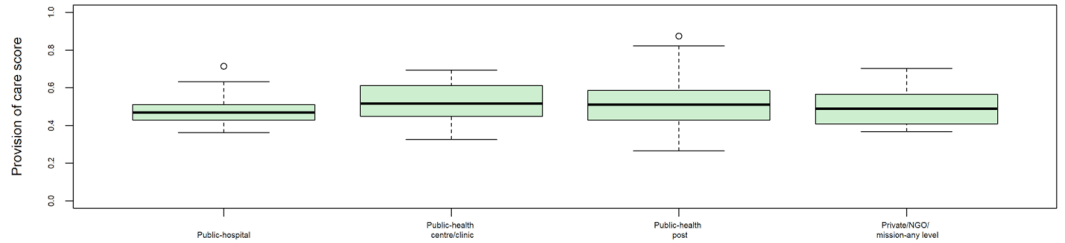
Malawi



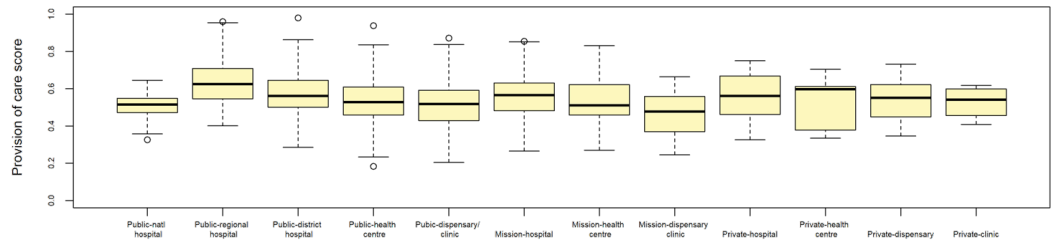
Nepal



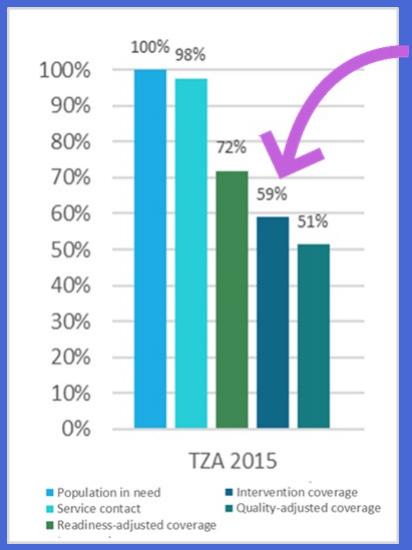
Senegal

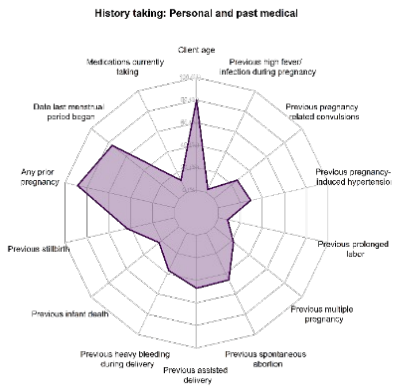


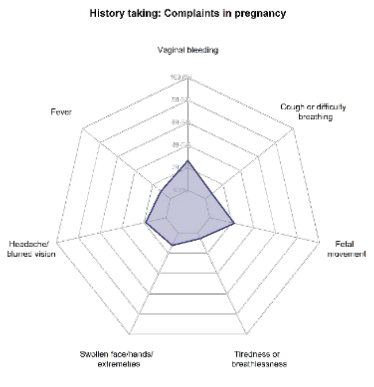
Tanzania

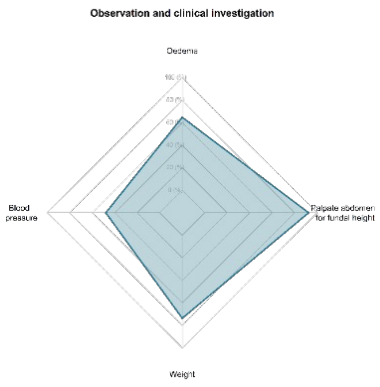


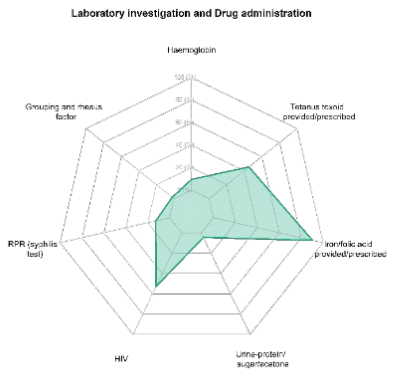
Provision/ experience of care scores by domain- Malawi

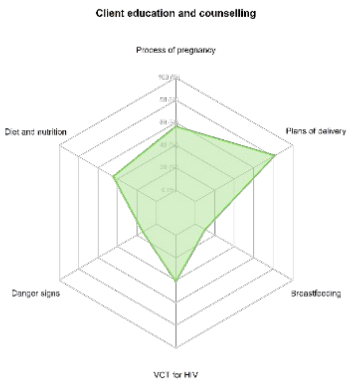


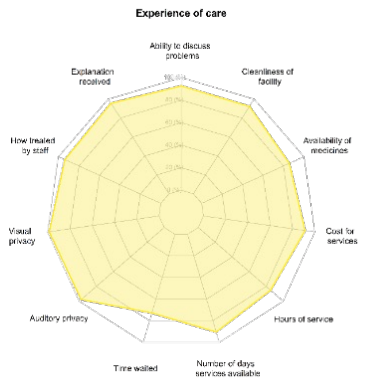




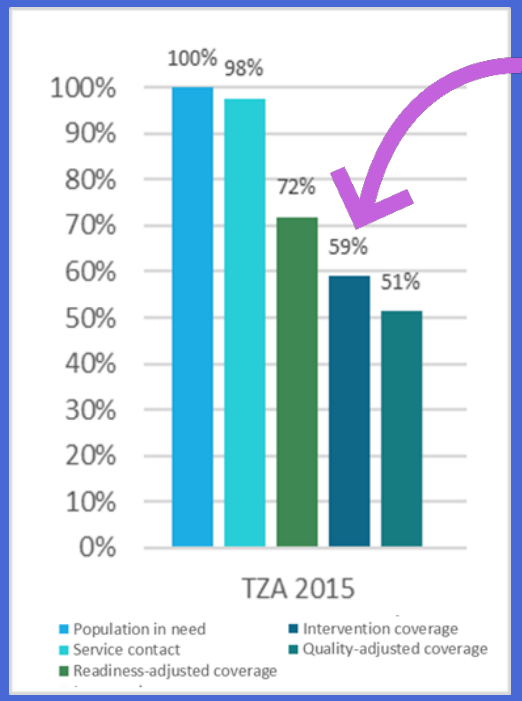








Provision/ experience of care scores by domain



Haiti

Malawi

Nepal

Senegal

Tanzania

What did we learn?

- Effective coverage cascades provide a summary measure of coverage and quality
- However, there are a number of challenges in doing this work.
  - Data availability
  - Complexity
  - Cascade interpretation and use

Q&A

Panelists

Moderator

Cindy Stanton

Stanton-Hill Research

Tanya Marchant

London School of Hygiene and Tropical Medicine

Aniqa Hossain

International Centre for Diarrhoeal Disease Research, Bangladesh

Seblewengel Lemma

London School of Hygiene and Tropical Medicine

Jennifer Requejo

United Nations International Children's Emergency Fund

Panel Discussion

Effective Coverage Analysis in Bangladesh

Presented by:
Aniqa Tasnim Hossain
Senior Research Investigator, icddr,b

icddr,b

Countdown to 2030

Women's, Children's & Adolescents' Health

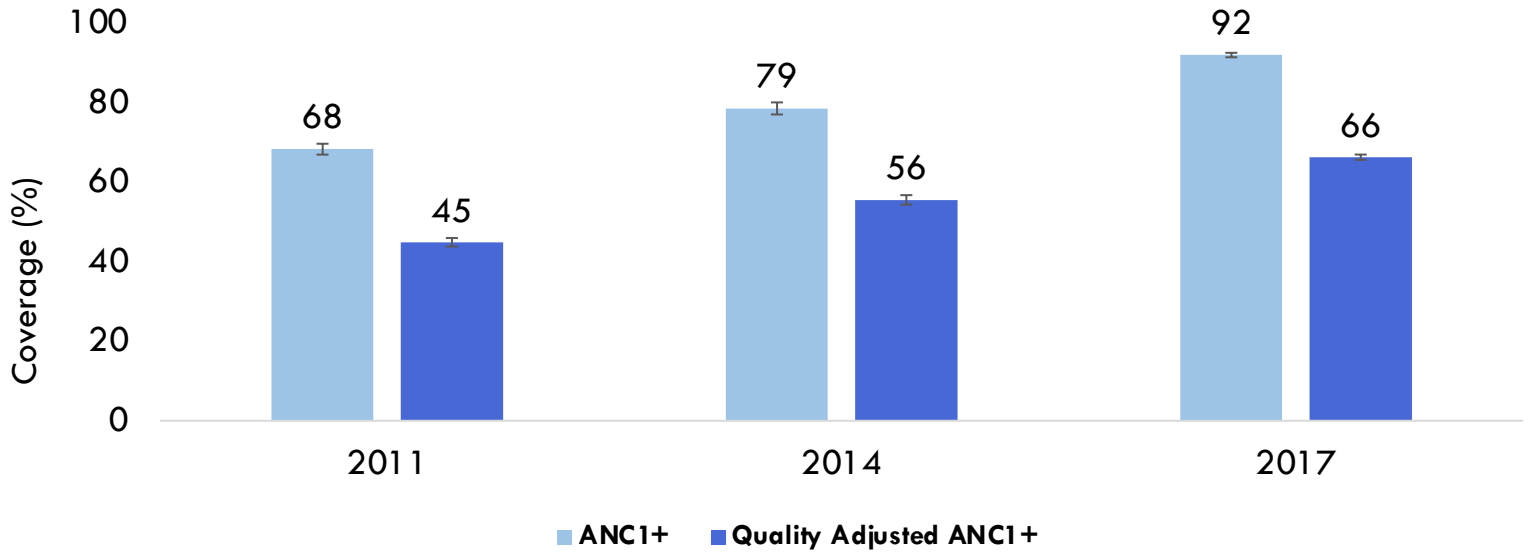
Bangladesh

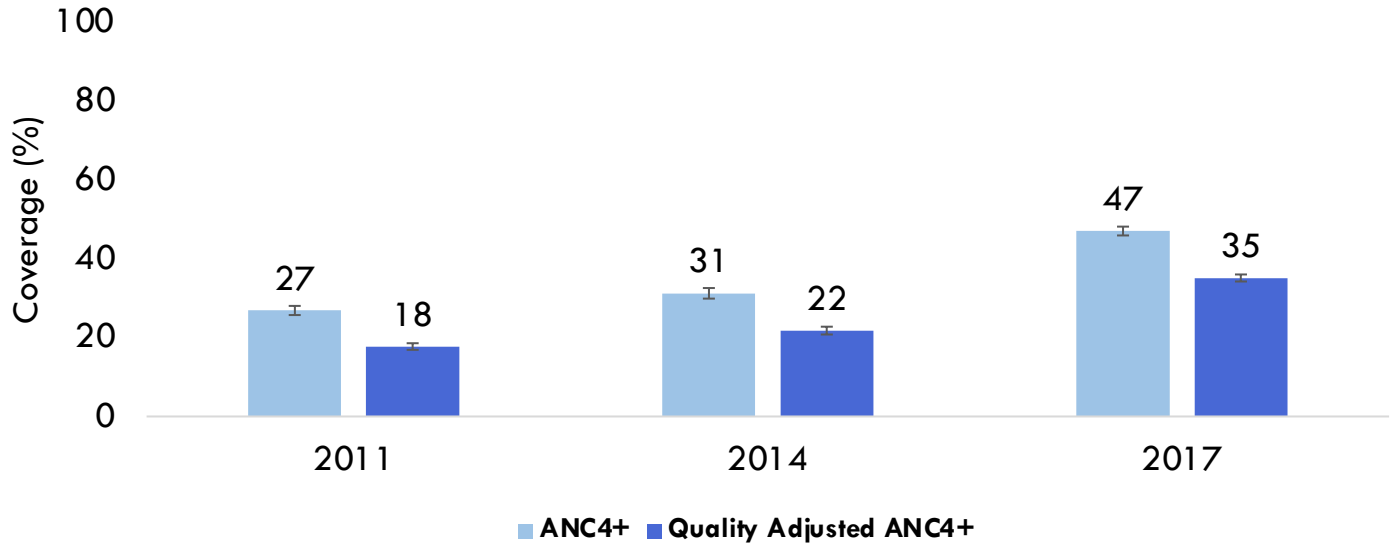
A GLOBAL HEALTH EXEMPLAR
Maternal & Newborn Health

Remarkable progress achieved in reducing NMR and MMR in last two decades

Quality adjusted ANC in Bangladesh (18 items, 5 domains)

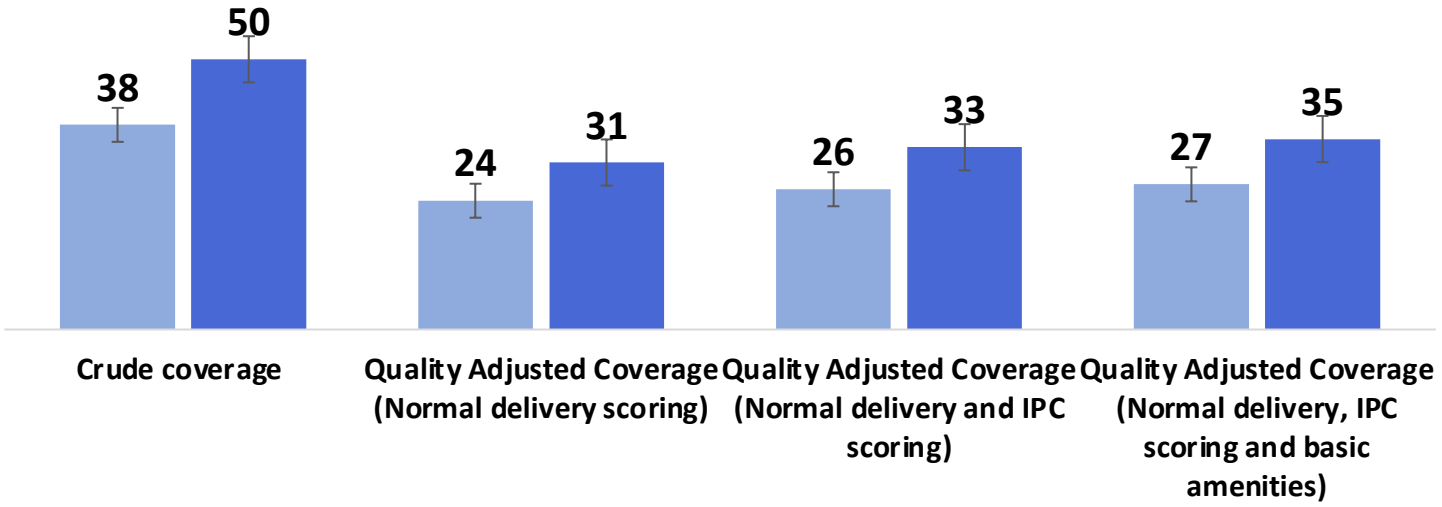
- ***Equipment***
- ***Diagnostics***
- ***Medicines & commodities***
- ***Basic amenities***
- ***Human resources***

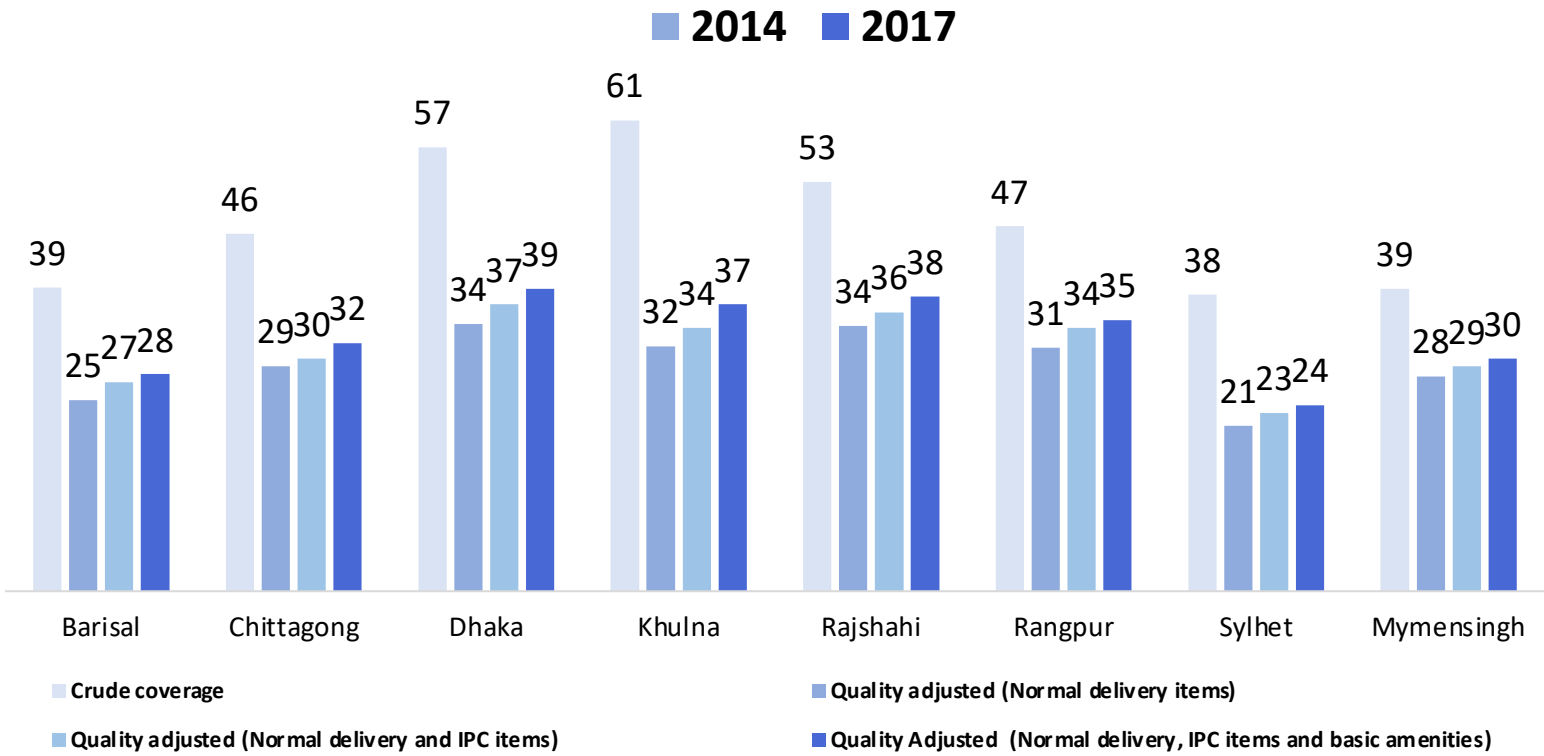




Quality adjusted delivery care in Bangladesh (13 NVD, 3 IPC and 2 basic amenities)

- ***Equipment***
- ***Guidelines***
- ***Medicines & commodities***
- ***Human resources***
- ***IPC***
- ***Basic amenities***





Johns Hopkins University

icddr,b

National Newborn Health Programme, Bangladesh

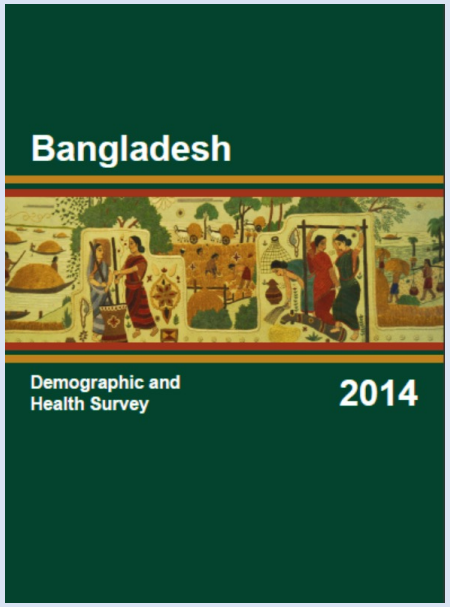
Maternal Health Programme, Bangladesh

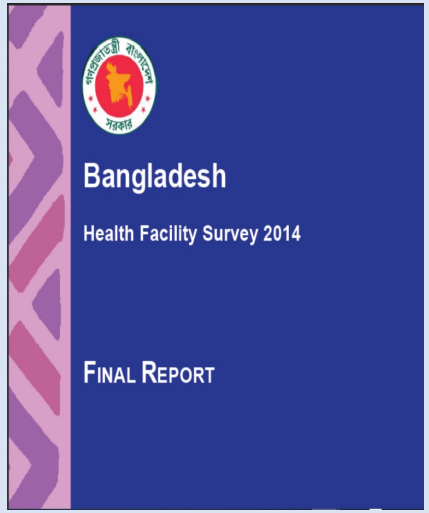
Professional bodies and Development Partners of Bangladesh

Dissemination event on "Global Health Exemplars in Maternal and Neonatal Mortality, Bangladesh"

What worked and missed opportunities?
How to better communicate these results for policy planning?

What's next?





Will be available soon

BDHS 2022–23

BHFS 2022

What is it like to do effective coverage analysis compared to coverage analysis?

```
*******Quality Adjusted Coverage****
****Delivery care****

use "BDFC72FLSP.dta", clear
gen wt=facwt/1000000
svyset [pweight=wt]
*if q102_16==1 | q102_07==1



gen facility=0
replace facility=1 if factype==1
replace facility=2 if factype==2
replace facility=3 if factype==3
replace facility=4 if inlist(factype,4,5,6)
replace facility=5 if factype==8
replace facility=6 if inlist(factype,9,11,12)
replace facility=7 if fact

label define fac 1 "                c- Upazila Health Complex(UHC)" 3
label values facilit


keep if q102_16==1 |  102_07==1

**** Maternal healt  servi      *****

gen prov = 0
replace prov=1 i      6    =1

gen guideline=0
replace guideline=1 i  q1608==1    1606==1


gen transport=0
replace transport =1 i  (q451        2==1)    q453==1

gen light=0
replace light=1 if q1622a    =1 & q162    3==1
```

Requires expert data analysis capacity

```
********** MERGE WITH SCORES DATASET *********
// n                                    ility type *****
// M

merg                                    June.dta"
drop if m15==.

merge m:1 facility region2 using "D:\\mean_score_fac&region_2014_3June_v2.dta"
drop if m15==.
drop if facility==.


replace score_total_nd=0 if facility==0
replace score_total_nd_ipc=0 if facility==0
replace score_sig_fun=0 if facility==0


gen del=0
replace del=1 if facility!=0
```

Cleaning

Recoding

Compute readiness scores

Reshaping, linking and merging DHS and HFS

Compute quality adjusted coverage

```
************* generation of scores ************

** overall score

egen tot                                                    li_pack suc_app neo_bag_mask parto g
gen sco
svy: mea

egen total_nd_ipc=rowtotal (total_nd soap water alocohol container waste)
gen score_total_nd_ipc=total_nd_ipc/18
svy: mean score_total_nd_ipc, over(facility)


*egen c                                                    k manual_vac vac_asp bnm partograph
*gen sc
*svy: mean score_total, over(facility)


**** Mat

egen co                                                    uction manual_vac vac_asp bnm partog

gen score_mhs=count_mhs/14
svy: mean score_mhs, over(facility)

***** Si

egen co                                                    p mva resus blood_trans csection)

gen score_sig_fun=count_sig_fun/9
svy: mean score_sig_fun, over(facility)

********

* distri
tab facility region, col
```

```
gen score_del_ipc= score_total_nd_ipc*del
svy: mean score_del_ipc // QaC of facility delivery
svy: prop del           // raw coverage of facility delivery
mean score_del_ipc [iw=wgt], over (region2)
```

Compute Simple coverage

Methods issues

How to link household and health facility data?

Which datasets to link considering the reference period?

How to select items to compute readiness scores?

How variable are the datasets to link?

Closing

Allisyn Moran
World Health Organization

Thank you for joining!

Please visit our website at:

improvecoveragemeasurement.com

for more information