

# NUTRITION DAE PROJECT

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**START  
CENTER**

STRATEGIC ANALYSIS,  
RESEARCH & TRAINING CENTER

Department of Global Health | University of Washington

# Meeting Agenda

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- Background
- Objective 1: Surveys
  - ▣ Methodology and Results
- Objective 2: Health Management Information Systems
  - ▣ Methodology and Results
- Objective 3: Databases
  - ▣ Methodology and Results
- Discussion
- Conclusion



## Motivation for measuring nutrition

- The Bill and Melinda Gates Foundation (BMGF) Nutrition team, Data, Analysis, and Evidence (DAE) initiative seeks to strengthen country data and information systems for nutrition
- The 2013 Lancet Maternal and Child Nutrition Series highlights evidence supporting nutrition-specific interventions<sub>1</sub>



### Maternal and Child Nutrition 2

## Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?

*Zulfiqar A Bhutta, Jai K Das, Arjumand Rizvi, Michelle F Gaffey, Neff Walker, Susan Horton, Patrick Webb, Anna Lartey, Robert E Black, The Lancet Nutrition Interventions Review Group, and the Maternal and Child Nutrition Study Group*



## Objectives for START Team

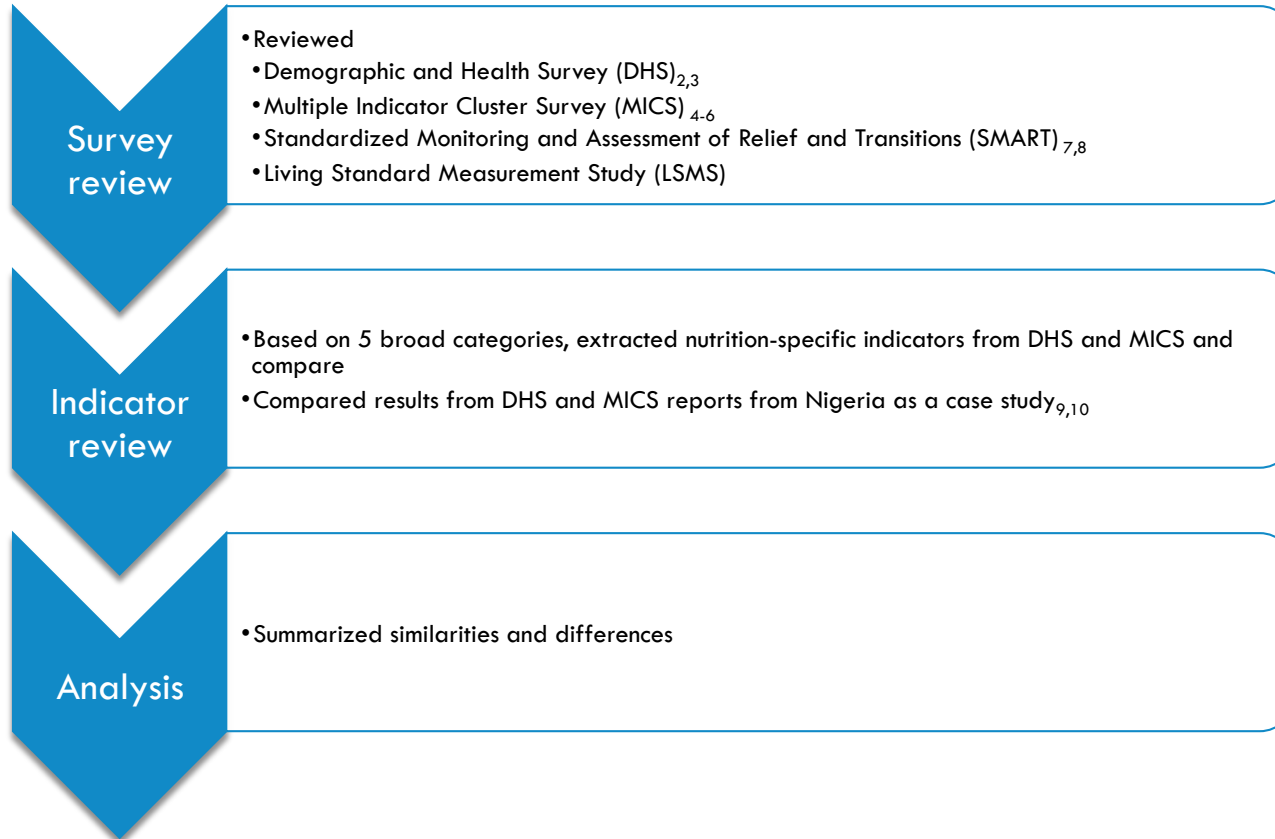
1. Conduct review and comparison of nutrition indicators and measurement methods in the current versions of the:
  - ▣ Demographic and Health Survey (DHS),
  - ▣ Multiple Indicator Cluster Survey (MICS), and
  - ▣ Standardized Monitoring and Assessment of Relief and Transitions (SMART)
2. Review published and gray literature documenting inclusion of nutrition indicators in routine health management information systems, with particular focus on the District Health Information System (DHIS2) platform and summarize results
3. Review global databases of nutrition data and provide summary of use

## Objective 1: Surveys

To review surveys and compare nutrition indicators



# Methodology



# Surveys


**SMART**


Survey	DHS	MICS	SMART	LSMS
Type	Nationally-representative household surveys	Household survey for national and sub-national populations	Iterative survey methodology used in emergency and developing settings	Nationally-representative and sub-national household surveys
Time frame	Typically conducted every 5 years (with interim surveys)	Rounds administered 3-5 years	Variable	Variable
# of countries	90	107	143 (using downloads as of 2015)	38

For more information, see Summary Workbook



## More on SMART

- SMART is a **methodology** that improves upon survey methods by balancing simplicity for rapid assessment in acute emergencies and technical soundness
- Typically collects
  - ▣ Nutritional status of children under-five years
    - Anthropometric measures – SAM, GAM, MUAC
  - ▣ Mortality rate of population
  - ▣ Food security (optional)
- Also offers software to help collect data

The logo for SMART, with the letters 'S', 'M', 'A', and 'R' in a dark grey font, and the letter 'T' in a lighter grey font. The 'M' is stylized with an orange arrow pointing upwards and to the right.



## More on SMART

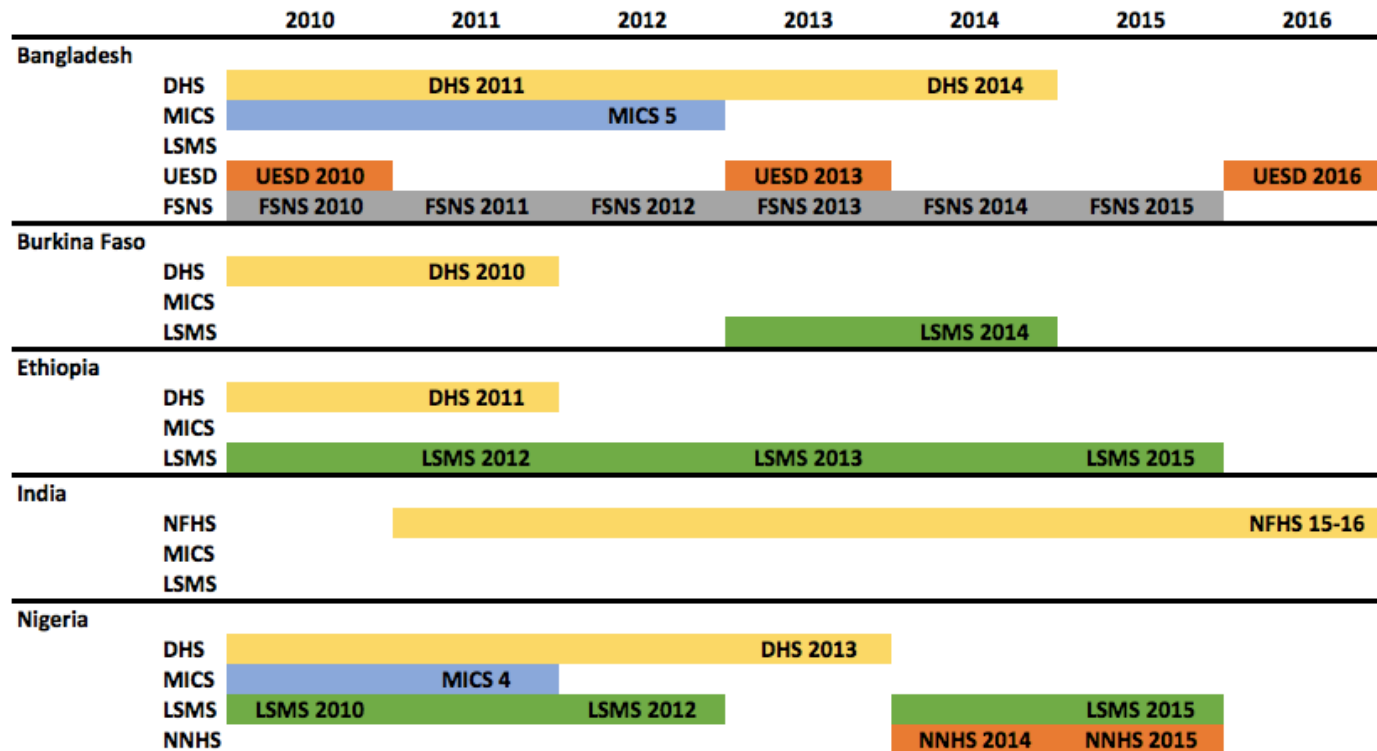
- In response to SMART, the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain set up the Complex Emergency Database (CEDAT) as a central repository of survey results
  - ▣ 3432 surveys in the database
  - ▣ Not available for public use
  - ▣ Unclear if still active
- Some application of SMART to conduct country-wide surveys

## Country-specific surveys

- **Bangladesh**
  - ▣ Utilization of Essential Service Delivery (UESD)
    - Interim survey to monitor program performance between DHS years
    - Survey scheme similar to DHS
    - Uncertain if UESD will be conducted in future years
  - ▣ Food Security and Nutrition Surveillance (FSNS)
    - Annual surveillance
- **India**
  - ▣ National Family Health Survey (NFHS)
    - On DHS website, managed by Government of India, TA by USAID and BMGF
- **Nigeria**
  - ▣ National Nutrition and Health Survey (NNHS)
    - Nationally-representative survey using SMART methodology



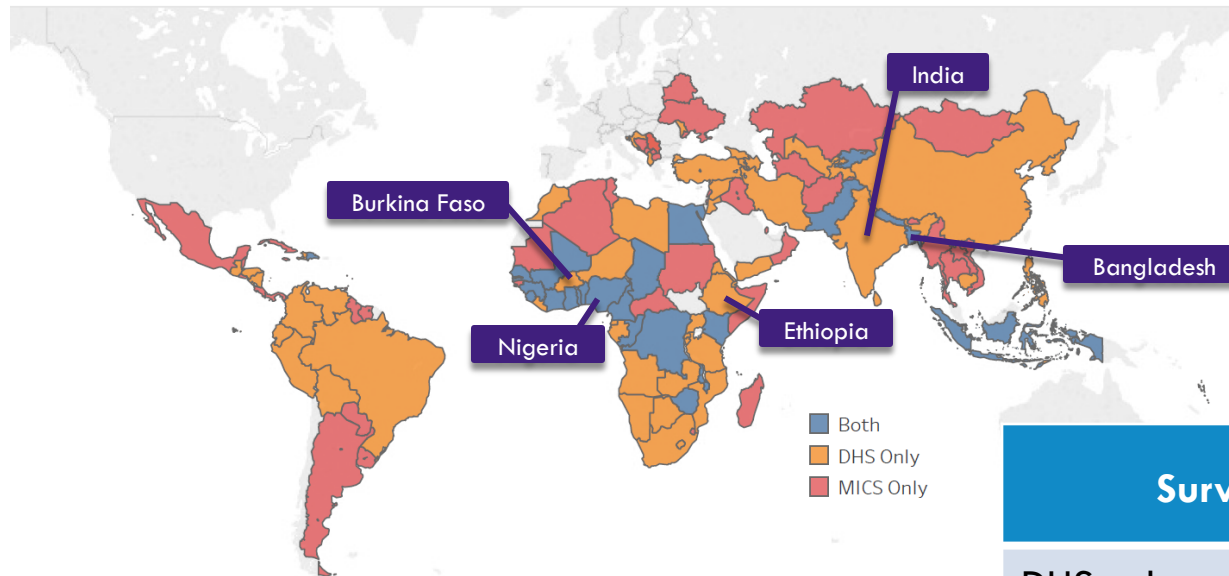
# Yearly co-occurrence of surveys in BMGF focus countries since 2010



Abbreviations: DHS, Demographic and Health Survey; MICS, Multiple Indicator Cluster Survey; LSMS, Living Standard Measurement Study; UESD, Utilization of Essential Service Delivery; FSNS, Food Security and Nutrition Surveillance; NFHS, National Family Health Survey; NNHS, National Nutrition and Health Survey



## Geographic co-occurrence of DHS and MICS since 2010



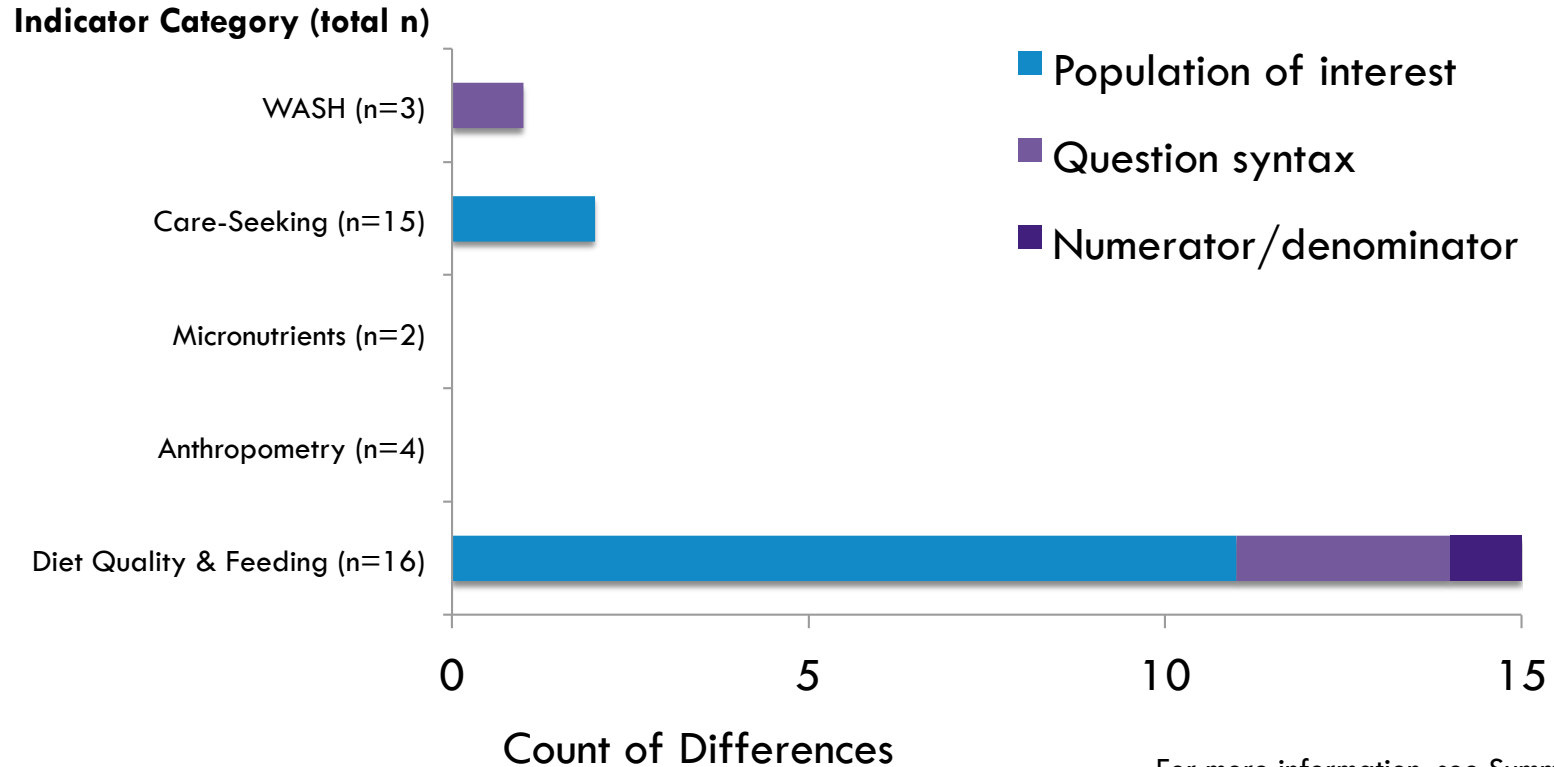
Surveys	# of Countries
DHS only	55
MICS only	46
Both DHS and MICS	24

## Summary of nutrition-related indicators by domain and survey

	Total Nutrition Indicators Collected between DHS/MICS	Individual nutrition indicators collected in DHS	Individual nutrition indicators collected in MICS	Overlapping indicators between surveys
<b>Diet Quality &amp; Feeding Practices</b>	18	18	16	16
<b>Anthropometry</b>	9	9	4	4
<b>Micronutrients</b>	13	13	2	2
<b>Care-Seeking</b>	18	17	15	15
<b>WASH</b>	4	3	4	3
<b>Total</b>	<b>62</b>	<b>60</b>	<b>41</b>	<b>41</b>

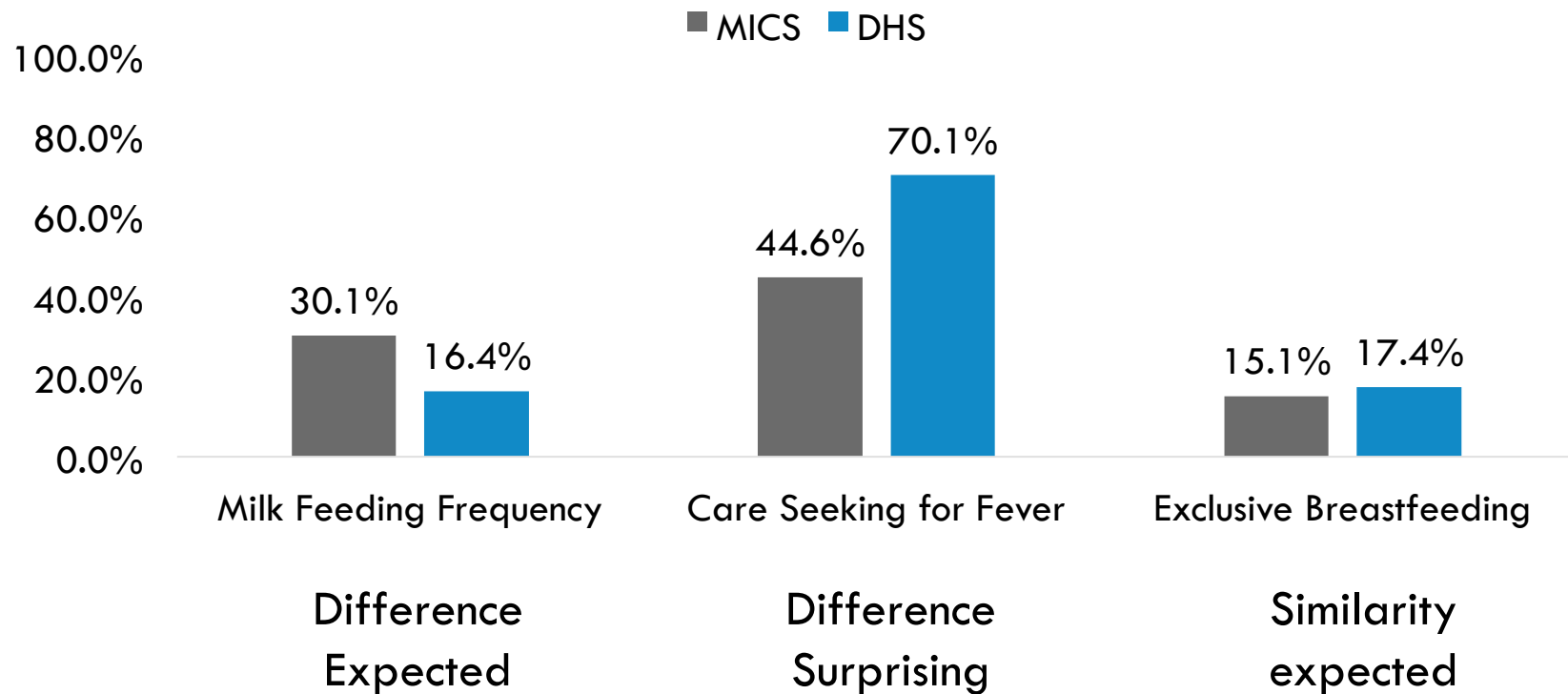


## Summary of differences in indicators collected by both surveys



For more information, see Summary Workbook

## Comparison of MICS 2011 and DHS 2013 results for Nigeria



## Gaps in nutrition indicators measured

Diet Quality & Feeding Practices	Anthropometry	Micronutrients	Care Seeking	WASH
<ul style="list-style-type: none"> <li>• 8 Dashboard Indicators</li> <li>• 6 other indicators</li> </ul>	<ul style="list-style-type: none"> <li>• 1 other indicator</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Dashboard Indicator</li> <li>• 4 other indicators</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• 3 other indicators</li> </ul>
Nutrition education during pregnancy, household food security, food supplementation, unhealthy snack food/beverage consumption, formula milk consumption, women's dietary diversity, breastfeeding counseling and support ...	Middle Upper Arm Circumference	Calcium, Vitamin K, Zinc supplementation for growth in children, zinc supplementation during pregnancy, folic acid	None	Hand washing at critical periods, environmental enteric dysfunction, Community Led Total Sanitation

- 'Dashboard Indicators' identified from BMGF's Nutrition Dashboard
- 'Other indicators' identified through topic experts





## Summary

- Attempts to harmonize DHS and MICS data, but still marked differences in measurement
- Most differences exist in Diet Quality and Feeding Practices, none exist for Micronutrients and anthropometry
  - ▣ Discrepancy between categories may be due to ease of measurement
- Room for improvement in scope of indicators captured in surveys

## Objective 2: Health Management Information Systems (HMIS)

To review the collection of nutrition data via health management information systems, especially DHIS2



## Methodology

### Literature review

- Conducted literature search in published and gray literature<sub>11-14</sub>
- Reviewed DHIS2 materials

### Informant Interviews

- Interviewed:
  - M&E team at Kenya MoH
  - Managing Director of Systems Innovations for Global Health Technology at I-TECH

### Case studies

- Summarized findings and built case studies for Kenya and Bangladesh





## Kenya Case Study: Using DHIS2 nationwide

- Kenya uses DHIS2 nationally for entire health sector – including nutrition
  - ▣ 11 core indicators, 50-60 data elements with all disaggregates

Underweight	Vitamin A Supplementation	Iron/Folate Fortification
Stunting	Micronutrient Powder	Treatment of SAM
Treatment of MAM	Early Breastfeeding	Exclusive Breastfeeding
Growth Monitoring	Deworming for Children	



## Kenya Case Study: DHIS2 nutrition has specific scope

- Data aggregated at facility level monthly from paper records
  - ▣ Community-level data only included if resulting from push from health facility
- System dedicated to routine surveillance
  - ▣ Leverages existing processes and structures for nutrition surveillance
  - ▣ Other systems used to house survey data such as DHS or MICS
- More frequent collection of key data could be used by policy makers
  - ▣ Understand time trends in progress
  - ▣ Potential identification of emergency or deteriorating nutrition situations

## Kenya Case Study: DHIS2 has limitations

- Primary limitation - human resources and capacity
- Continuous QI/QA
  - ▣ Technical working group and advisory committee organize routine meetings
  - ▣ Standards set for data quality and completeness
- Successful implementation linked to existing mechanisms and framework for nutrition surveillance

## Bangladesh Case Study: Current use of DHIS2

- Bangladesh has a large health system with 9 implementing authorities
- The Directorate General of Health Services (DGHS) is the largest implementing authority with over 100,000 officers and staff members
- DGHS uses the DHIS2 as their primary reporting system
  - ▣ 10 nutrition indicators captured in the Integrated Management of Childhood Illness (IMCI) and Nutrition Corner

C. Nutrition Information	
1. Anemia (0 - 5 years)	
2. Low Birth Weight (within 72 hour of birth)	
3. Breast Feed within 1 hour of birth (0-2 years)	
4. Exclusive breast feeding (0 – upto 6 months)	
5. Complementary Feeding (6-23 months)	
6. Underweight (0 - 5 years)	
7. Stunting (0 - 5 years)	
8. Wasting (0 - 5 years)	
9. Severe Acute Malnutrition (SAM) (6 month to 5 years)	
10. Moderate Acute Malnutrition (MAM) (6 month to 5 years)	
D. Counseling	
IYCF, Vitamin-A, IDD, Anaemia, MNP, etc.	





## Bangladesh Case Study: Reporting back data entered into DHIS2

- An example of DHIS2 capability: Nutrition data entered into DHIS2 are reported back to health workers in quarterly National Nutrition Services

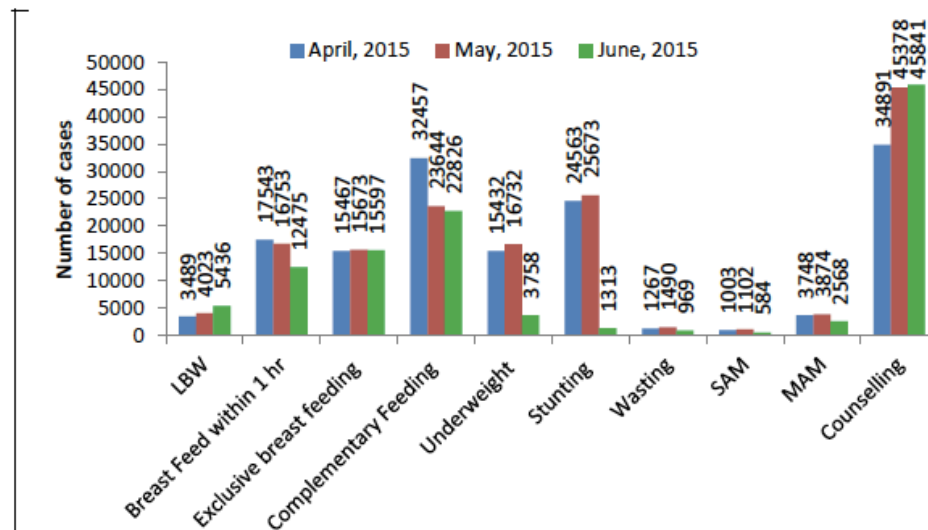


Figure 7: Number of under 5 children reached by IMCI & Nutrition corners and PLW who have taken nutrition counseling (April –June 2015)

Source: Online HMIS, MIS-DGHS

- However, a review of the National Nutrition Services revealed possible limitations of standardized nutrition indicators collected in IMCI and suggest a reassessment of nutrition indicators



## Bangladesh Case Study: Another use of DHIS2

- Bangladesh Ministry of Health and Family Welfare has large, complex, fragmented health system
- Several management information systems are implemented; with little to no communication between systems

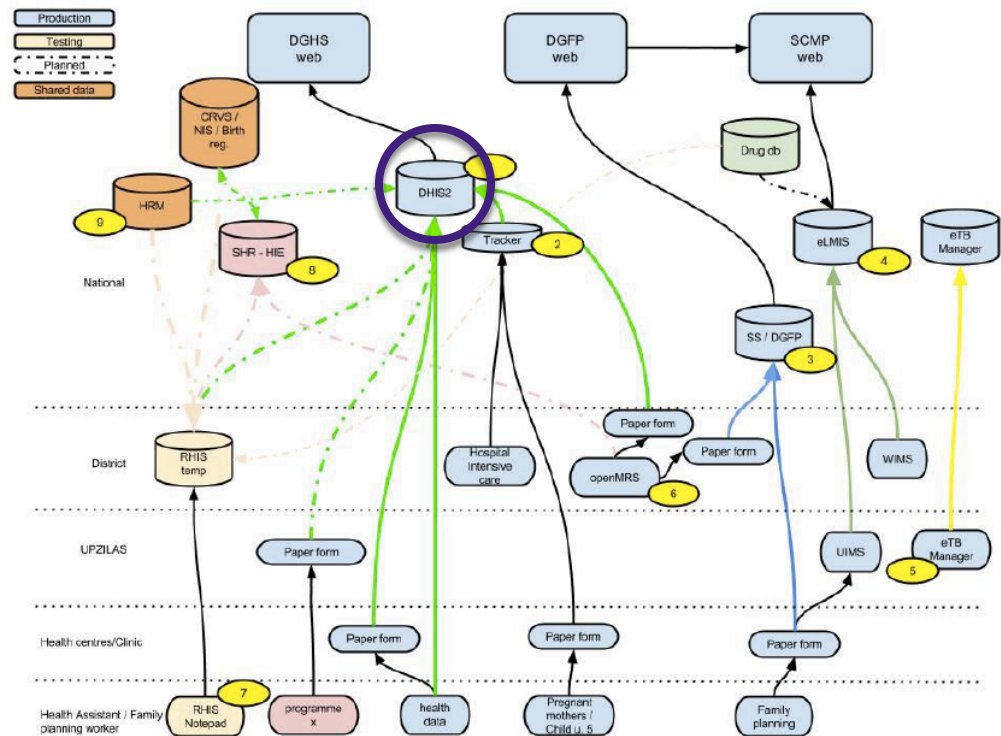


Figure 1. Health information system map

## Bangladesh Case Study: Making effort to streamline HMIS

- There is a desire to consolidate all aggregate health data and reports
- DHIS2 has been recommended as the primary reporting system

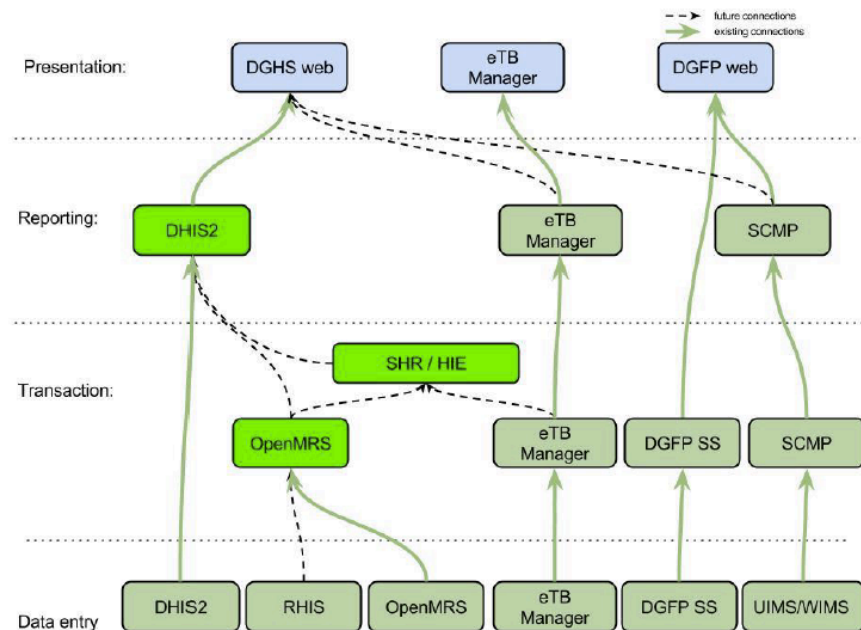


Figure 2. Recommended data/reporting flow of the existing HISS in Bangladesh

## Summary

- DHIS2 is a potentially powerful, low-cost data management tool
- Requires significant human resources and established surveillance practices to be successful
- Countries with fragmented and/or decentralized health systems may face additional struggles against successful implementation



## Objective 3: Databases

To review global databases of nutrition data and provide summary of use

## Methodology

### **16 databases reviewed for operability, data source, frequency of updates, and visualization capability**

- Global Database on the Implementation of Nutrition Action
- Global Targets Tracking Tool\*
- Nutrition Landscape Information System
- Vitamin and Mineral Nutrition Information System (VMNIS)
- WHO Global Database on BMI
- WHO Global Database on Child Growth and Malnutrition
- WHO Global Data Bank on Infant and Young Child Feeding
- Joint Malnutrition Dataset from WHO, UNICEF, and World Bank
- UNICEF – Infant and Young Child Feeding
- UNICEF – Iodine Deficiency
- UNICEF – Low Birth Weight
- UNICEF – Vitamin A Deficiency
- World Bank Health Nutrition and Population Statistics
- USAID Dollars to Results
- IHME Data Exchange
- Global Nutrition Report\*



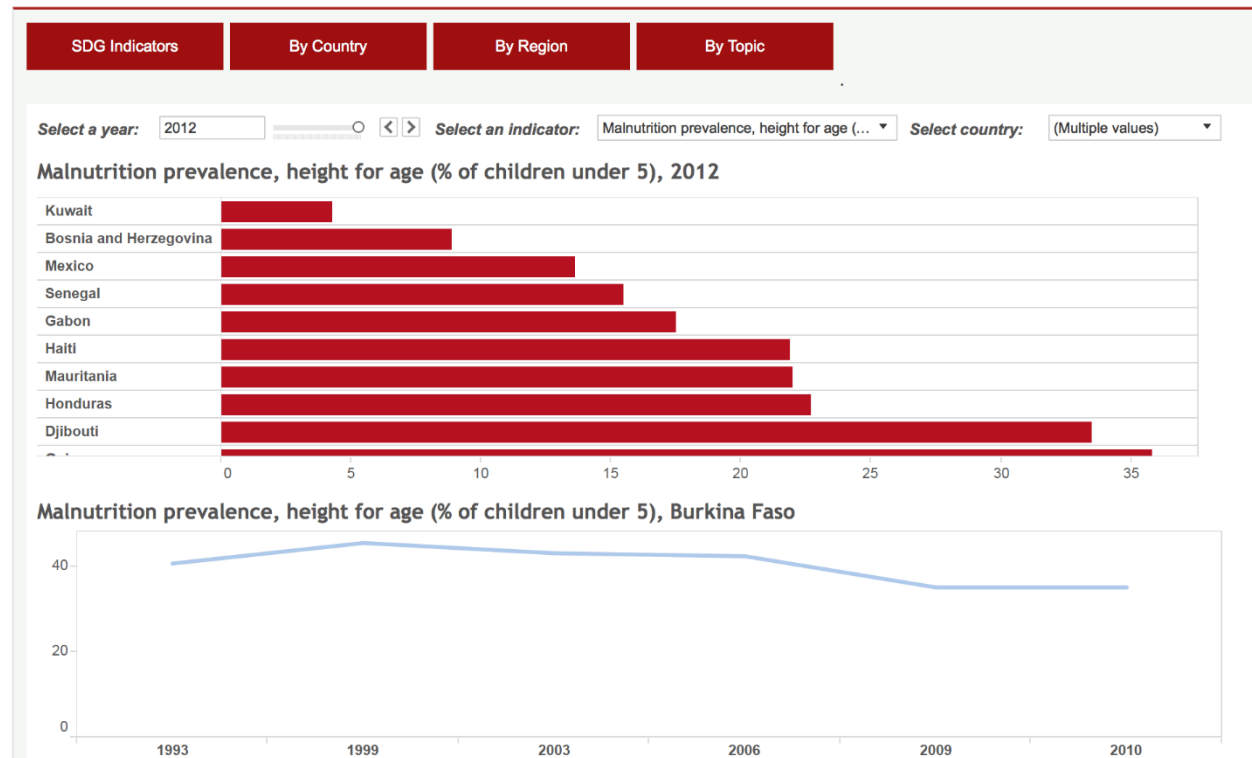
## High Usability: wide indicator range, visualization capability, interactive

- World Bank Health Nutrition and Population Statistics
  - ▣ Sourced from household surveys and census records
  - ▣ Wide range of indicators
  - ▣ Biannual updates
  - ▣ Users can query by country, indicator, and year in addition to interacting with dashboard and visualizations
- Nutrition Landscape Information System
  - ▣ Gives country-specific overviews of young children and women's nutrition
  - ▣ Sourced from other databases
  - ▣ Wide range of indicators
  - ▣ Limited customizability but can view data points over time in one easy view



# World Bank Health Nutrition and Population Statistics

## HNP Data Dashboards





# Nutrition Landscape Information System (NLiS)



## NLiS Country Profile: United Republic of Tanzania



What are the current states of indicators contributing to a comprehensive view of nutrition for health and development in United Republic of Tanzania? See **national** data below.

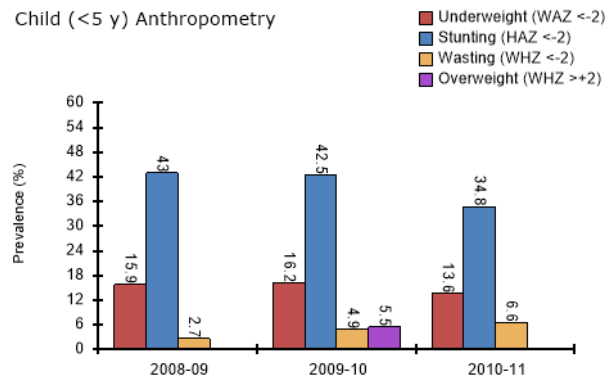
Choose a Country View the NLIS nutrition indicator summary for the selected country

TANZANIA, UNITED REPUBLIC OF

Go

### Child Malnutrition

Child (<5 y) Anthropometry



Indicator	Year	Value	Source Info
% Low birthweight (<2500 g)	2010	8.0	<a href="#">View</a>
% Overweight (BMI-for-age >+1 SD) in school-age children and adolescents 5-18 years		no data	



## Low Usability: analyzable, downloadable, current data, but not interactive

- ❑ 8 databases categorized
- ❑ Some only feature one indicator
- ❑ Largely sourced from nationally-representative household surveys
- ❑ Limited indicator ranges or only available for selected countries
- ❑ Are drawn upon by “High Usability” databases

### Global Database on Child Growth and Malnutrition

#### Countries and territories

Click on a country name below to open respective page from where to access the available data and reference tables. Prevalence data are presented based on WHO standards and NCHS reference. If no data are available a link to the reference table provides information on published studies of interest.

In the Notes column of the data table, "Converted estimates" refers to national surveys for which it was impossible to reanalyze the original raw data. In these cases in order to convert NCHS reference-based to WHO standards-based estimates an algorithm was applied (see [www.who.int/nutgrowthdb/publications/algorithms](http://www.who.int/nutgrowthdb/publications/algorithms)).

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#)

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[Afghanistan](#)

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[Algeria](#)

[American Samoa](#)

[Angola](#)



## Inoperable/Under Construction (but aiming for high usability)

- WHO Global Database on BMI
  - ▣ Not currently operable
  - ▣ Efforts underway to information system with web-based mapping of expanded anthropometry data
- Vitamin and Mineral Nutrition Information System (VMNIS)
  - ▣ Currently under construction
  - ▣ Redesign underway to allows users to query information by selected variable and make tables and graphs
- Aiming for high usability once completed



## Other Nutrition Tools and Databases

- Global Targets Tracking Tool
  - ▣ Used to estimate annual targets required to reach specified goals
- Global Database on the Implementation of Nutrition Action (GINA)
  - ▣ Collects qualitative data on existing nutrition policies and activities
- Institute for Health Metrics and Evaluation Data Exchange
  - ▣ Nutrition has disparate, cross-cutting impact on DALYs/Deaths
  - ▣ Not explicitly designed to easily quantify nutrition related burden
- Global Nutrition Report
  - ▣ Not a typical database, but nicely summarizes country-level nutrition indicators

## Summary

- Most databases updated regularly and upkeep
- Many share similar data sources (often DHS and MICS)
- Largely fragmented – a system for every focus
- Few databases feature customizable, interactive dashboards
  - Low usability could benefit from updating to current dashboard capabilities

## Conclusion

## Conclusion

- DHS and MICS have significant overlap – but direct comparison of results is cautioned
  - ▣ SMART data are likely even less comparable, due to methodological differences
- DHIS2 is an exciting opportunity for improvement of surveillance
  - ▣ Requires existing processes and structure for nutrition surveillance for success
- Global nutrition data are readily available in many databases
  - ▣ Could benefit from centralization and feature development for user interface

Thank you!



# References

1. Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S, et al. Evidence-based interventions for improvement of maternal and child nutrition: What can be done and at what cost? *Lancet*. 2013;382(9890):452–77.
2. ICF International. Nutritional Status of Women and Children, A 2014 Update on Nutritional Status by Sociodemographic and WASH Indicators Collected in DHS. 2014.
3. International MD. Guide to DHS statistics. Demographic and health surveys methodology. 2006.
4. UNICEF. MICS6\_List\_of\_Indicators\_v3. 2016.
5. UNICEF. MICS Questionnaire for Children under five. 2013.
6. UNICEF. MICS Questionnaire for individual Women. 2013.
7. SMART. Measuring Mortality, Nutritional Status, and Food Security in Crisis Situations: SMART METHODOLOGY. 2006.
8. Altare C, Guha-Sapir D. The complex emergency database: A global repository of small-scale surveys on nutrition, health and mortality. *PLoS One*. 2014;
9. National Population Commission Nigeria. NIGERIA DEMOGRAPHIC AND HEALTH SURVEY 2013. 2013.
10. National Bureau of Statistics. Nigeria Monitoring the situation of children and women Multiple Indicator Cluster Survey 2011. 2011;421.
11. Kabir MH, Chowdhury SK. Seminar on Strengthening the Routine Health Information System of the Ministry of Health and Family Welfare in Bangladesh. 2015.
12. Anderson S, Humayun M, Kibria KM, Duarte K. Bangladesh Health Information Systems Mapping Analysis. 2015;
13. Ministry of Health and Family Welfare. Health Bulletin 2016. Government of the People's Republic of Bangladesh; 2016.
14. Saha KK, Billah M, Menon P, Arifeen S El, Mbuya NVN. Bangladesh National Nutrition Services

