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# USING HCES FOOD ACQUISITION DATA TO BETTER UNDERSTAND DIETARY PATTERNS: A NIGERIAN EXAMPLE

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## Case Study: Nigeria General Household Survey, Post-Harvest Panel, 2010- 2011

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# Dietary Assessment at Population Level

- **Goal: determination of usual intakes of foods in specific population groups**
  - Measuring total consumption
    - Food, beverages and supplements
    - Selecting the dietary assessment method
  - Estimation of Total Nutrient Intakes
    - Food Composition Tables / Nutrient Databases
  - Assessment of nutrient intakes
    - Use of Reference Values: DRIs from FAO/WHO, USA/Canada, etc.
    - Dietary Guidelines / Dietary Guidance



# Dietary Assessment Methods

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- Food records or diaries (including weighed intakes)
- Dietary recalls
- Food frequency questionnaires (FFQ's)
- Dietary histories
- Observed intakes
- Chemical analyses of duplicate collections of foods consumed
- Biological assessments (e.g. doubly-labeled water, plasma carotene, etc.)

No dietary method can measure dietary intake without error. It is important that sources of error are taken into account when assessing dietary intake



# Methodologies for Indirect Estimations of Food Consumption

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- **Pre-defined Food Lists**
- **Inventory of foods for family consumption**
  - Foods purchased or from different sources (e.g. own production, donated, etc.)
- **Food Consumption**
  - At home
  - Away from home
- **Estimation of food quantities and costs**
  - Food Expenditure Profiles
  - Food Intake
  - Energy and Nutrient Intakes



# METHODS

## [Data Processing]

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- Data from the LSMS, General Household Survey (GHS), post-harvest panel, 2010-2011
  - Demographics,
  - Income and economic data
  - Food and non-food expenditure
  - Foods consumed at home and away from home



# METHODS

## [Data Processing]

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- Food acquisition data collected over a specific number of days (at household levels)
  - Converted into daily food amounts
  - Identified Food Acquisition by source
    - Purchased
    - Produced
    - Gifted (gifts, donations)
    - Other



# METHODS

## Development of a Food Composition Table –FCT

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- Compilation of energy and nutrient values from the USDA Nutrient Database
- Consultation & reviews by national experts
- Improvements with entries from the West African FCT
- Complemented with food descriptions from published papers and Internet searches about ethnic foods
- Development of “recipes” for mixed dishes



# METHODS

## [Estimation of Energy and Nutrient Content]

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- Development of analytical datasets
- Assessment of data plausibility
- Nutrient Analysis
- Statistical estimations with data adjusted with sample weights





# SAMPLE DESCRIPTION, NIGERIA 2010-11



	N	%	N	%
<b>National</b>	4,173	100.0	24,940	100.0
<b>Sector</b>				
Urban	1,301	31.2	6,979	28.0
Rural	2,872	68.8	17,961	72.0
<b>Zone</b>				
North Central	731	17.5	4,494	18.0
North East	738	17.7	5,372	21.5
North West	854	20.5	5,716	22.9
South East	385	9.2	1,931	7.7
South-South	689	16.5	3,922	15.7
South West	776	18.6	3,505	14.1
<b>Poverty Indicator*</b>				
Quintile 1	664	15.9	5,177	20.8
Quintile 2	717	17.2	5,088	20.4
Quintile 3	796	19.1	5,039	20.2
Quintile 4	867	20.8	4,895	19.6
Quintile 5	1,129	27.1	4,741	19.0

\*Estimated as per capita consumption expenditure, in quintiles

# SAMPLE DESCRIPTION, by Age and Sex

Age Categ. (years)	Male		Female		Total	
	n	%	n	%	n	%
<1	921	51.6	446	48.4	921	100.0
1.0-3.9	3,515	52.2	1,681	47.8	3,515	100.0
4.0-4.9	1,252	50.5	620	49.5	1,252	100.0
5.0 - 8.9	5,494	50.9	2,699	49.1	5,494	100.0
9.0 - 13.9	3,447	50.9	3,321	49.1	6,768	100.0
14.0 - 14.9	670	51.8	624	48.2	1,294	100.0
15.0 - 18.9	2,410	53.5	2,097	46.5	4,507	100.0
19.0 - 50.0	11,406	46.6	13,045	53.4	24,451	100.0
>=51.0	3,864	52.4	3,514	47.6	7,378	100.0
Totals	27533	49.5	28,047	50.5	55,580	100.0

# Food Sources: Purchased and Total. Nigeria 2010

Food Groups	Purchased Foods		Total Food Acquisition	
	N	%	N	%
Wheat flour & bread	2,067	49.5	2,108	50.5
Maize flour	135	3.2	211	5.1
Rice(local & imported)	2,951	70.7	3,434	82.3
Other grains (sorghum, maize) and flour	1,334	27.0	2,620	62.8
Cassava	157	3.8	462	11.1
Gari (White & yellow)	1,382	33.1	1,871	44.8
Other Root, potatoes and tuber	1,929	46.2	2,669	64.0
Beans	2,408	57.7	3,052	73.1
Groundnuts, other nuts, seeds and pulses	545	13.1	750	18.0
Palm & groundnut oils	3,356	80.4	3,734	89.5
Other fats & oils	312	7.5	355	8.5
Fruits	1,150	27.6	1,441	34.5
Vegetables (fresh, dried or canned)	3,869	92.7	3,972	95.2
Chicken, poultry and eggs	603	14.5	723	17.3
Meat (beef, pork, mutton, goat, other)	2,380	57.0	2,427	58.2
Fish and seafood	2,834	67.9	2,918	69.9
Milk & dairy	1,329	31.8	1,414	33.9
Sugar	1,866	44.7	1,924	46.1
Other sweets, jam, honey	240	5.8	257	6.2
Condiments, salt, spices	2,041	48.9	2,214	53.1
Coffee, tea, oth beverages & sweet drinks	1,680	40.3	1,719	41.2
Alcoholic beverages	423	10.1	449	10.8
<b>Total # Households</b>	<b>4,173</b>	<b>100.0</b>	<b>4,173</b>	<b>100.0</b>

# MAIN SOURCES OF FOOD ENERGY

Food Groups	Food Energy (%)	
	Mean	Median
Other grains and flour	39.9	38.1
Gari (White & yellow)	21.7	17.9
Rice	18.3	15.9
Palm & groundnut oils	17.6	14.9
Cassava	17.5	10.7
Maize, flour	13.5	9.9
Other Root, potatoes & tuber	12.5	9.2
Beans	10.3	9.1
Other fats & oils	9.2	7.1
Groundnuts, other nuts, seeds & pulses	7.0	4.8
Wheat flour & bread	5.6	3.7
Fish and seafood	4.4	2.8

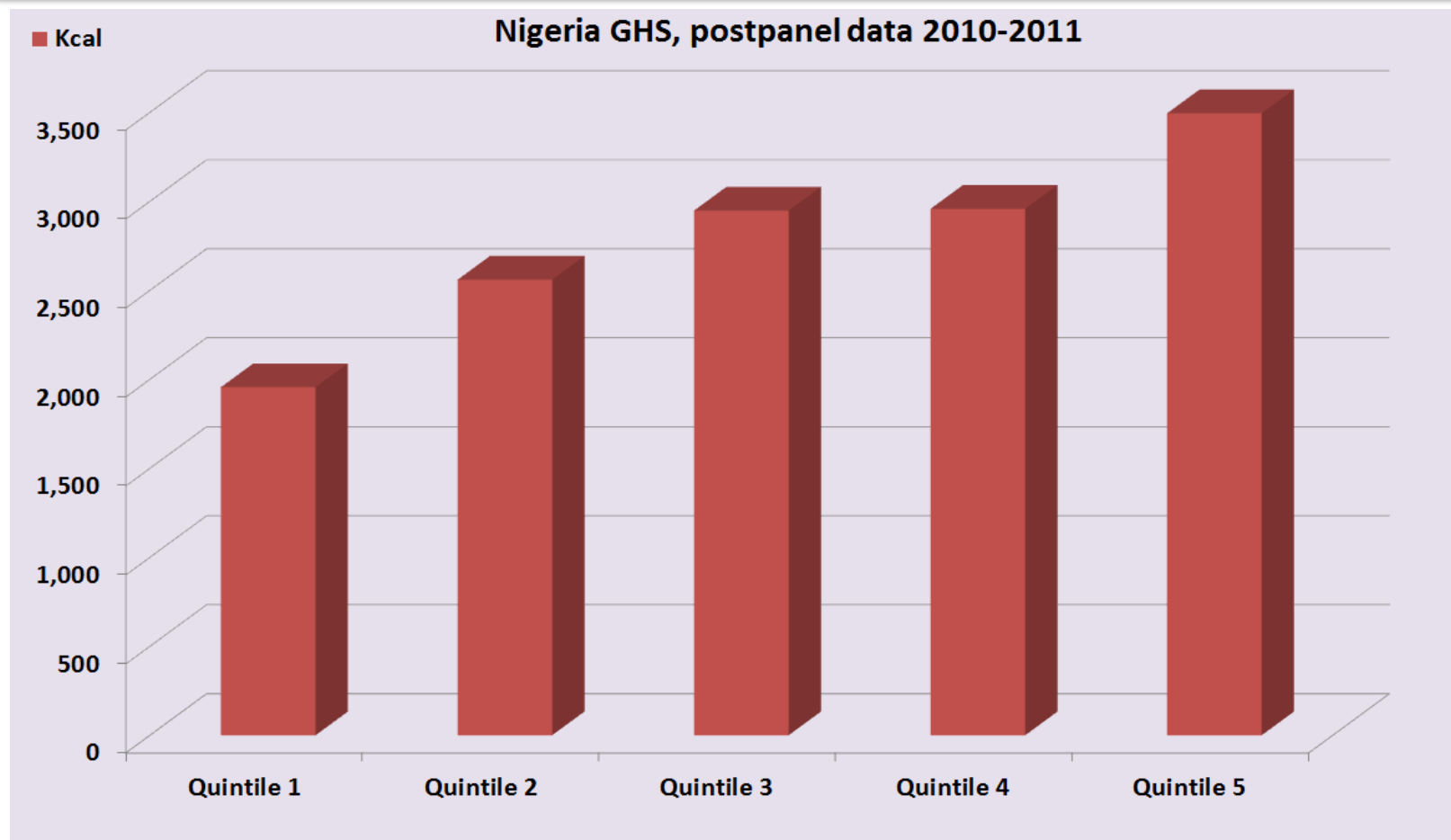
## Energy Sources in 2003 (Nat Nutr. Survey)


Rice 14.8% , Cassava 12.9%, Maize 10.6%, Yam 10.1%

# FOOD SOURCES OF VITAMIN A

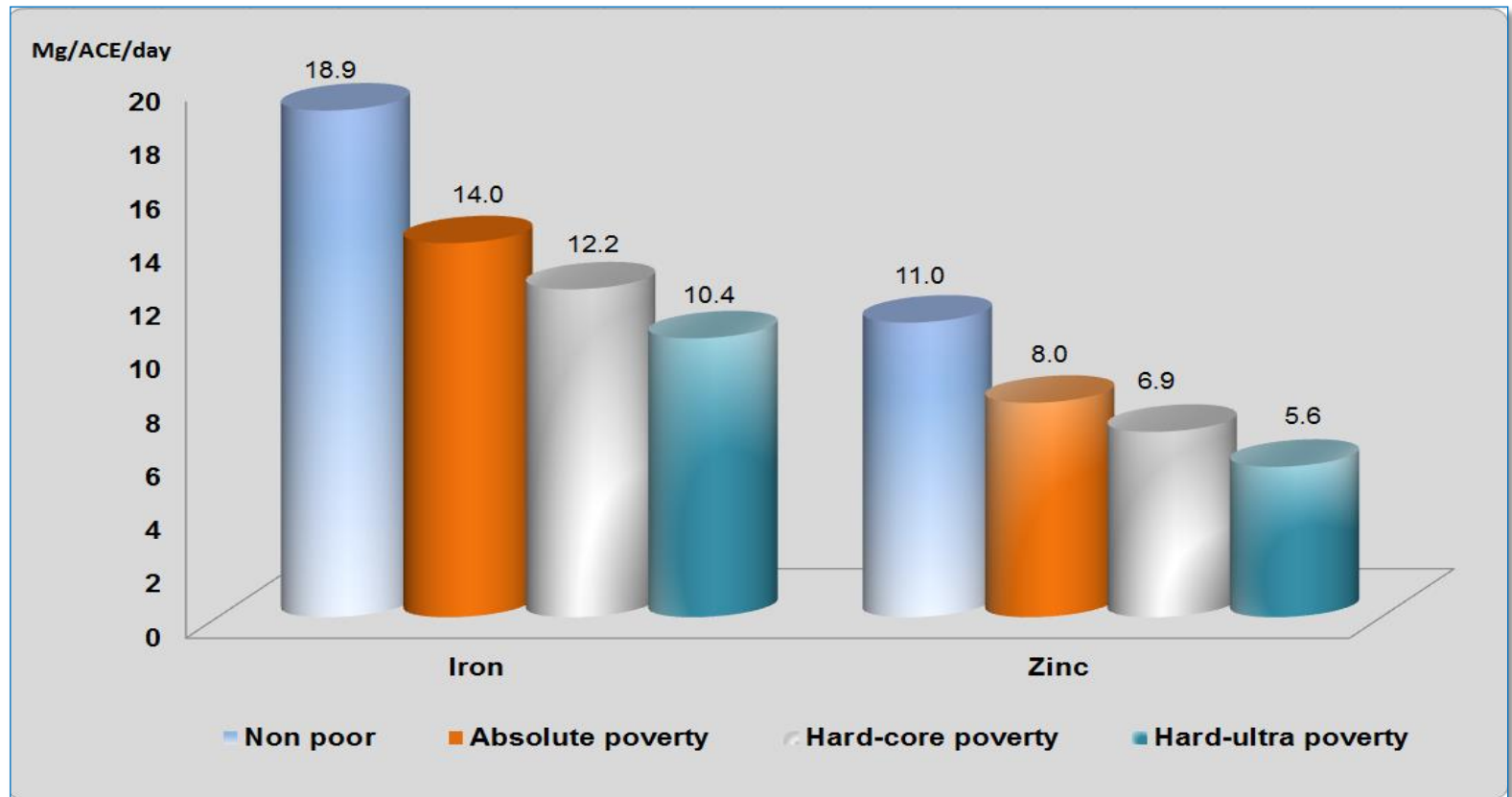
Food Groups	Vitamin A (%)	
	Mean	Median
Other Root, potatoes and tuber	37.2	28.0
Vegetables (fresh, dried or canned)	36.4	29.6
Other fats & oils	28.4	10.6
Milk & dairy	21.0	13.1
Condiments, salt, spices	17.8	9.2
Chicken, poultry and eggs	16.1	11.6
Fish and seafood	12.4	5.6
Maize flour	12.2	7.4
Fruits	5.9	2.5
Gari (White & yellow)	5.1	2.5
Cassava	4.9	1.3
Other grains and flour	3.9	0.0
Other sweets, jam, honey	2.9	0.0

# Apparent Energy Intake (kcal) by Poverty Estimates. Nigeria 2010



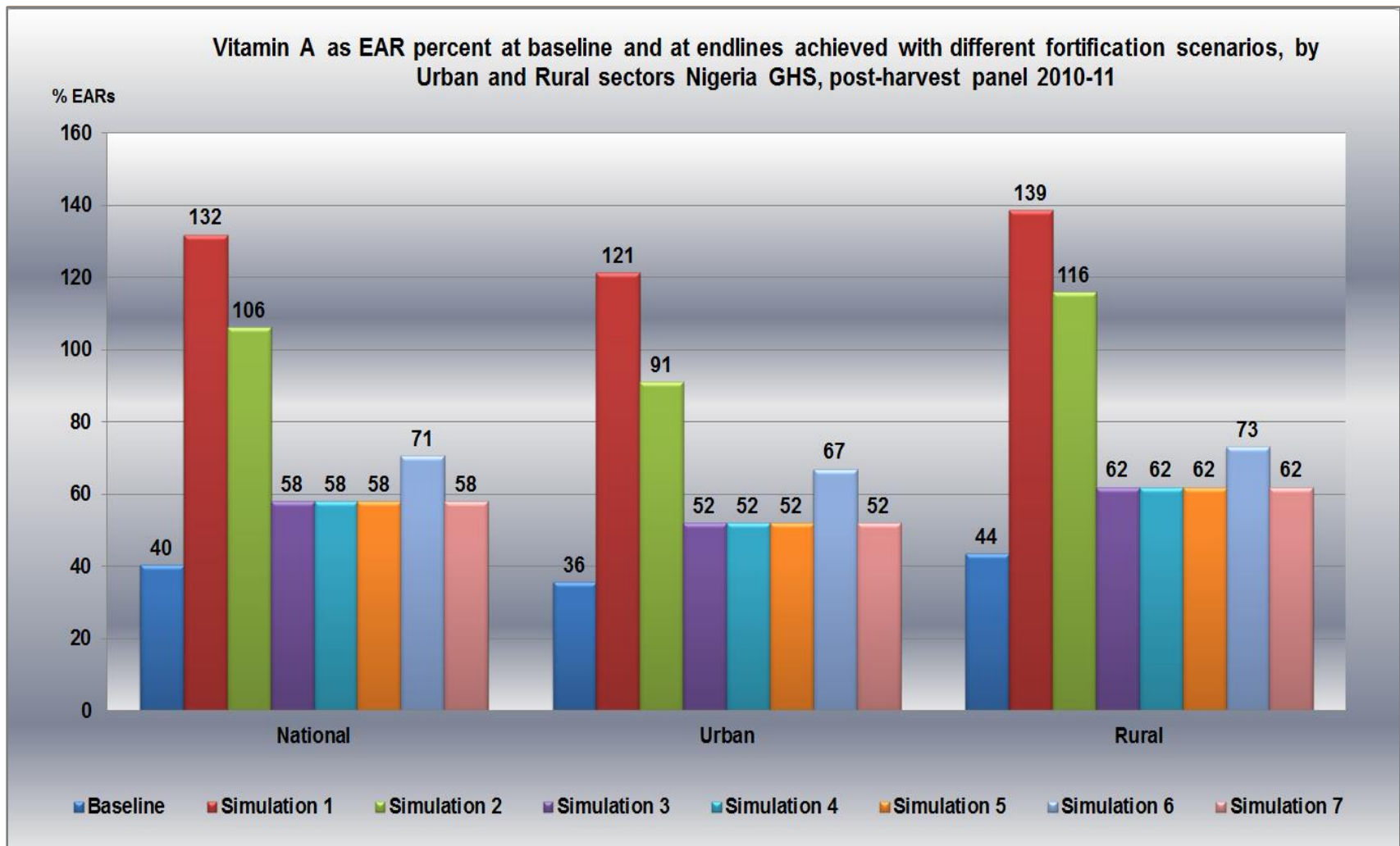


# Mean Intakes of Iron and Zinc by Poverty Status (mg/ACE/day), Bangladesh 2010



Daily needs per ACE (Adult consumption equivalents):  
21.3 mg of Iron and 8.8. mg of Zinc

# Vitamin A as EAR % at Baseline and Endlines. Nigeria 2010







# LIMITATIONS

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- Use of HCES, non-dietary data, for dietary purposes
- Assumptions for intra-household food distribution based on pre-established factors (e.g. ACE)
  - Does not address nutrition needs of pregnant, lactating and young children
- Potential for under-reporting (short memory, education level, different sources of foods)
- Potential for over-estimation of consumption due to over-reporting, wastage and/or stockpiling



# CONCLUSIONS

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- Apparent intakes of foods and selected micronutrients were estimated with the 2010 HCES of Nigeria
  - We were able to assess inadequate intakes of specific MNs (vitamin A, iron and zinc)
  - A particular strength of the data was the inclusion of foods eaten away from home
- The results could guide the identification of vulnerable populations that could be targeted for:
  - micronutrient fortification
  - supplementation programs or,
  - other types of interventions



# CONCLUSIONS

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- The identification of potential fortification vehicles is needed as we are aware that this is a proven intervention that, along with others, could help in the alleviation of micronutrient deficiencies
  - In the most vulnerable countries of the world (e.g. in Sub-Saharan Africa and South Asia)
  - And among them, in the most vulnerable group: children <5
    - Half of the deaths and half of the disability-adjusted life years (DALYs) are due to deficiencies of vitamin A, iron, zinc and iodine.



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