

The Dynamics of Nutrition Research in West Africa: Tracking the Evidence

Technical Note

Prepared by Transform Nutrition West Africa, with support from the Bill & Melinda Gates Foundation

Summary

[Transform Nutrition West Africa](#) is a regional initiative to support effective policy and programmatic action on nutrition through evidence generation, synthesis, and mobilization.

This technical note provides methodological detail on the evidence tracker that was developed by Transform Nutrition West Africa for the purpose of digesting all nutrition-relevant research evidence published in the West Africa region. Results are presented in the evidence note and can be accessed through an online visualization platform.

1. OBJECTIVE

The aim of the evidence tracker was to identify, catalogue, rank, and summarize the best available evidence on nutrition in a rapid, timely, and systematic manner, and then to disseminate these evidence summaries among decisionmakers in a quarterly newsletter. To enhance the accessibility of this research evidence to decisionmakers in the region and to facilitate their ability to use it, we assessed the dynamics of these evidence summaries (peer-reviewed literature only) over a 2.5-year period.

2. METHODOLOGY

2.1 Research question

What are the dynamics of nutrition research in West Africa?

2.2 Research question framework: PICOS

We used the Population, Intervention/Exposure, Comparison, Outcome, Setting (PICOS) framework to translate the research question and build the search syntax (Table 1).

Table 1. PICOS framework

PICOS	Details
Population	Infants and young children, adolescents, women of reproductive age, mothers
Intervention/exposure	Study reporting on any nutrition-relevant areas (prevalence, programs, policy, implementation, etc.)
Comparison	No comparison needed
Outcomes	Any nutrition outcome (for example, undernutrition, overnutrition, diet-related noncommunicable diseases or micronutrient deficiency)
Setting	<ul style="list-style-type: none">• Countries of West Africa as defined by the Economic Community of West African States (ECOWAS)• West Africa as a region• Multicountry studies reporting on a West African country
Time frame	Studies published between June 2018 and January 2021
Study type	Any study design
Language	English, French, Portuguese

Source: *Transform Nutrition West Africa: evidence tracker protocol, 2018*

2.3 Search strategy and screening

The systematic search was carried out quarterly in the bibliographic database [MEDLINE](#), in [Google Scholar](#), and in key nutrition-relevant¹ websites for the region. The search strategy was developed in MEDLINE using a variety of Medical Subject Heading (MeSH) terms and general nutrition terms, as well as broad nutrition-specific and nutrition-sensitive free text terms. The search terms were adapted from the MEDLINE search strategy to Google Scholar and to the website search (more details on search syntaxes can be found [online](#)). Titles and abstracts of the retrieved studies were screened against predetermined eligibility criteria (**Table 2**). For a study to be included in this rapid review, it had to: (1) report on primary research in West Africa; (2) report on a nutritional outcome among women of reproductive age (WRA), infants and young children, or adolescents; and (3) be written in English, French, or Portuguese. Between September 2018 and January 2021, the search yielded 5,462 studies, of which 399 qualified for inclusion. Reasons for exclusion included: reporting only on males or elderly members of the population; reporting on a disease-specific population where there was no use of a comparison group, such as, for example, HIV+ members of a population); reporting on a disease-specific intervention related to, for example, cancer or pharmacological studies unrelated to nutrition;

¹ Nutrition-relevant means that the policy and/or program can be either nutrition specific (addressing immediate determinants of nutrition) or nutrition sensitive (addressing underlying causes of undernutrition).

reporting on disease-specific outcomes unrelated to nutrition, with the primary outcome being mortality; and reporting on areas outside of the West Africa region (**Table 2**).

Table 2. Eligibility criteria

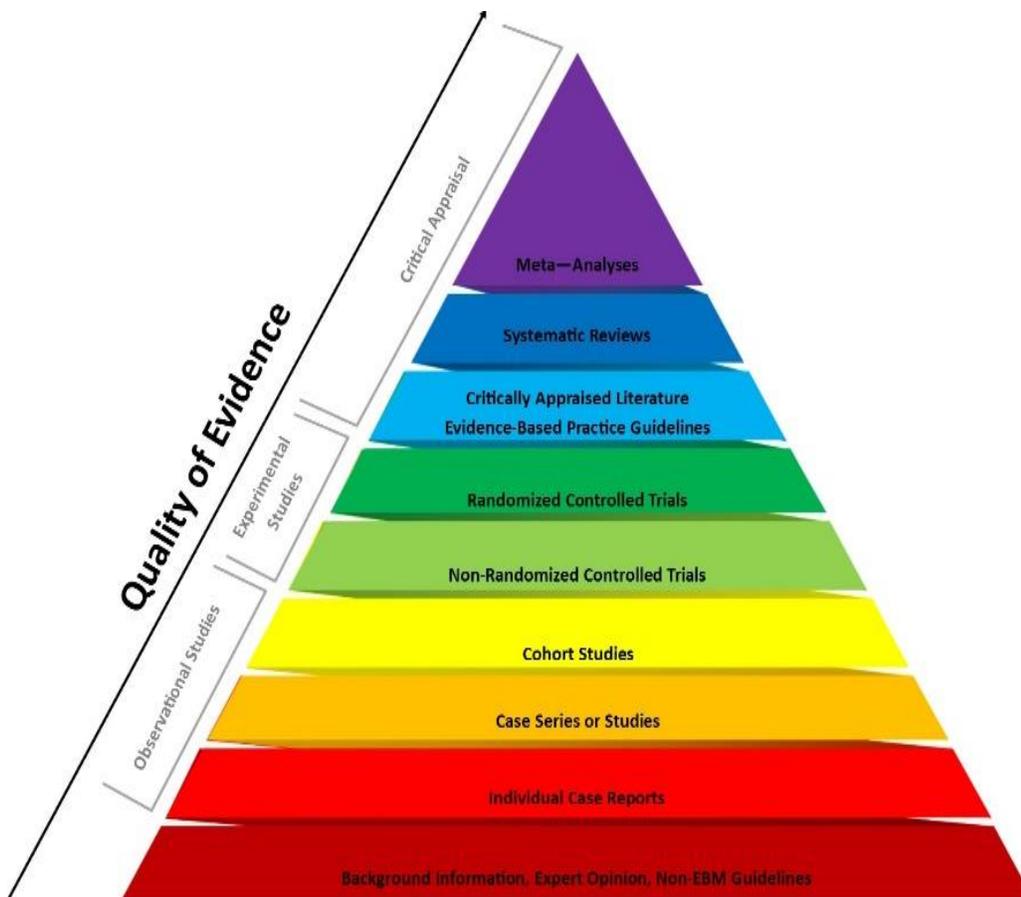
PICOS	Includes	Excludes
Population	Any participant group, but outcome needs to be focused on mothers, infants, and young children as well as adolescents	<ul style="list-style-type: none"> • Studies of only male members of a population • Studies of only elderly members of a population • Studies of disease-specific populations where no comparison group was included (for example, studies of only HIV+ members of a population)
Intervention/exposure	Any intervention/program/initiative reporting on nutrition-sensitive or nutrition-specific outcomes (including obesity, diet-related noncommunicable diseases, agriculture, etc.)	Exclusion of disease-specific interventions (cancer or pharmacological studies unrelated to nutrition)
Comparison	N/A	N/A
Outcomes	World Health Assembly indicators and other MIYCN indicators (including dietary diversity)	<ul style="list-style-type: none"> • Disease-specific outcomes that do not relate to nutrition (Ebola, cancer) where the primary outcome is mortality
Setting	<ul style="list-style-type: none"> • Countries of West Africa as defined by the Economic Community of West African States (ECOWAS) • West Africa as a region • Multicounty studies from which West African country data can be extracted 	Non-ECOWAS countries
Time frame	Studies published between September 2018 to January 2021	
Study type	Peer-reviewed literature; any study design	Grey literature(produced outside of the main academic publishing channels)
Language	English, French, Portuguese	All other languages

Source: *Transform Nutrition West Africa: evidence tracker protocol, 2018*

2.4 Scoring and ranking evidence

The search yielded 5,462 studies, of which 1230 qualified for inclusion. The retained studies (n = 1,230) were scored from lowest (0) to highest (7) using a composite score for their relevance and for the rigor of the research methods used. Relevance was scored based on the priorities as set by decisionmakers in West Africa and on the focus and novelty of the research. Rigor aimed to identify the best available evidence and was scored using the broad categories of the evidence pyramid, including background information or expert opinion, observational studies, experimental studies, and critical appraisal. Studies were then ranked. In order to identify the best available evidence, only studies with a score of between 5 and 7 were included in the evidence tracker (n=399). To ensure that the included evidence touched on a range of methodologies, qualitative studies were appraised and scored independently using the COREQ (COnsolidated criteria for REporting Qualitative research) [checklist](#). Rigor was scored using the evidence pyramid shown in Figure 1. Studies were given scores of 1 to 4, with 4 being the highest quality of evidence. Categories of evidence included: background information or expert opinion (score of 1); observational studies (score of 2); experimental studies (score of 3); and critical appraisal (score of 4).

Figure 1. Evidence pyramid



Source: *Transform Nutrition West Africa: evidence tracker protocol, 2018*

Relevance was scored according to key criteria set out by the research team. Criteria (with yes = 1 and no = 0) included: (1) was the publication relevant to the priorities of Transform Nutrition

West Africa’s target audience or partners and was the study’s focus novel; (2) did the publication address gaps in data, information, and research, as identified by Transform Nutrition West Africa’s analysis framework entitled the “5PD Cycle” (Problems, Policies, Programs, People, and their Priorities); and (3) did the publication use an innovative method/framework or address an innovative concept such as, for example, the double burden of malnutrition (Table 3).

Table 3. Relevance criteria

Criteria	Relevance score guidance
Relevance for Transform Nutrition West Africa’s target audience/partner priorities (yes = 0; no = 1)	1. Does the study address at least one of the partner’s priorities? <ul style="list-style-type: none"> • P1: Captured, documented, and learned from implementation experiences (programs and scaling up) • P2: Strengthened regional/national/subnational capacity to collect, analyse, and report relevant data and experiences/best practices • P3: Accelerated equitable program coverage of maternal, infant, and young child nutrition interventions at scale • P4: Made food systems and value chains address challenges more effectively • P5: Assessed and strengthened institutional capacity and leadership/championship to implement policies and hold governments to account 2. Was the study conducted in a focal country or in West Africa? 3. Does the study address a high-burden public health problem? 4. What is the effectiveness of the study? 5. Does the study offer a social science perspective?
Novelty of the study (yes = 0; no = 1)	<ul style="list-style-type: none"> • Does the study use innovative methods, that is, interventions we have not seen before in this context? • Does it address innovative concepts such as double burden of malnutrition, diet-related noncommunicable diseases, or overweight/obesity? • Does it use novel frameworks?
Addressing gaps (yes = 0; no = 1)	<ul style="list-style-type: none"> • Does it address gaps identified by the 5PD Cycle (which searches for data, information, and research on problems, policies, programs, people, and their priorities); that is to say, does it address research gaps in domains other than specifically those of the problem and its prevalence? • Does it focus on countries in West Africa other than Nigeria and Ghana, that is, on areas where very little research has been conducted? • Does the study focus on adolescents?

Source: Transform Nutrition West Africa: evidence tracker protocol, 2018

2.5 Data extraction

Extraction was performed at an abstract level for the highest-ranked studies (those that scored between 5 and 7; n = 399). Extracted information included: type of evidence (policy, intervention, implementation, burden, prevalence), country/countries reported, nutrition outcomes, study design, target population, intervention description, and the level of research (national, subnational). Because of the large number of study designs and types of nutrition outcomes, the extraction of information related to these extraction variable categories was a two-stage process. First, information related to study design and nutrition outcomes was extracted as it appeared in the abstract. Second, these extraction variable categories were broadly grouped; that is, study design variables were aggregated into a “study design

taxonomy”² (Annex 1) and nutrition outcome variables were aggregated into “nutrition categories” (Annex 2) and nutrition outcome variables were aggregated into “nutrition categories” (Annex 2).

2.5 Quality assessment

The quality of retained studies was assessed using a broad critical appraisal checklist which assessed sampling, data collection and analysis, and limitations of the study design. For all study designs, we checked the overall study reporting, that is, the consistency of the study’s stated objectives with its conclusions. Quality of the study was rated according to its compliance with a certain number of our checklist criteria, with “good” quality corresponding to the observance of at least three of the criteria in the table 4. Meeting at least three of our criteria affirmed the fitness of the methodology for generating the evidence in this paper; it also demonstrated the presence of an appropriate level of evidence for each publication (Table 4 shows details of the quality checklist.)

Table 4. Quality checklist by type of study design

Study design	Sample	Data collection	Data analysis	Study limitations
Systematic review	Are studies or evidence types appropriate to the review question?	Was there a systematic search using more than one database and supplementary search methods?	Were methods of quality assessment and synthesis (narrative, meta-analysis, or meta-synthesis) appropriate?	Were the limitations of the review methods and of the evidence base clearly identified?
Randomized controlled trials	Is there randomization and concealment of allocation?	Was there blinding (if possible) and completeness of follow up?	Were there appropriate outcomes, measured appropriately, at appropriate intervals?	Were study limitations identified and was there an investigation of bias?
Experimental and observational studies	Was a population clearly specified and defined and were sampling methods justified?	Was there an appropriate measure of exposure or a complete description of the intervention?	Were there appropriate outcomes, measured appropriately, at appropriate intervals?	Were study limitations identified and was there an investigation of bias?
Policy analysis and critical appraisal	Is the stated position the result of an analytical process?	Were the sources of documentation and/or opinion appropriate?	Were recognised methods of policy analysis used?	Was there a discussion of uncertainties?
Qualitative	Was the sample selected appropriate to the research question?	Were recognised methods of qualitative data collection used?	Were recognised methods of qualitative data analysis used?	Was there a discussion of study limitations?

Note: For all study designs, we checked the overall study reporting, that is, the consistency of the study’s stated objectives with its conclusions.

² Taxonomy refers to the classification of data into categories and subcategories.

3. SYNTHESIS

The extracted information was brought together in a systematic Excel map to identify the dynamic of evidence in the information retrieved. This was then summarized using narrative synthesis.

4. ANNEX

Annex 1: Study design taxonomy

This is an aggregated taxonomy that groups specific study designs into broader categories.

Study design	Study design taxonomy (Aggregated study designs)
Case control	Observational study
Case study	Observational study
Cross-sectional	Observational study
Cohort	Observational study
Qualitative	Qualitative
Mixed method	Mixed method
Policy analysis	Policy analysis
Experimental study	Experimental study
Randomized controlled trial (RCT)	RCT
Review (narrative, scoping)	Review (narrative)
Systematic review/meta-analysis	Systematic review/meta-analysis
Critical appraisal/critical analysis	Critical appraisal/critical analysis
Review/critical analysis	Critical appraisal
Narrative review (critical analysis of evidence-based policy guidelines)	Critical appraisal
Evidence-based practice guidelines	Critical appraisal
Intervention	Experimental study
Measurement comparison	Observational study
Modeling	Observational study
Observational	Observational study
Panel	Observational study
Pilot study	Observational study
Policy framework	Policy analysis
Policy review	Policy analysis
Protocol for RCT	RCT
Quasi-experimental	Experimental study

Prospective cohort study nested in an RCT	Observational study
Retrospective study	Observational study
Retrospective panel data analysis	Observational study
Retrospective cohort analysis	Observational study
Spatial modeling	Observational study
Secondary data analysis	Observational study
Secondary analysis of an RCT	RCT
Validation study	Observational study
Non-RCT	Experimental study

Annex 2. Aggregated taxonomy for nutrition outcomes

This is an aggregated taxonomy that groups specific nutrition outcomes into broader categories.

Initial nutrition outcomes	Nutrition categories (Grouped nutrition outcomes)
Stunting	Undernutrition
Wasting	Undernutrition
Low birth weight	Undernutrition
Overweight/obesity	Overweight/obesity
Anemia	Anemia
Hemoglobin	Anemia
Linear growth	Undernutrition
Growth	Undernutrition
Micronutrients	Micronutrient deficiency
Breastfeeding (general, undefined)	Infant and young child feeding (IYCF)
Early initiation of breastfeeding	IYCF
Exclusive breastfeeding over 6 months	IYCF
Diet-related noncommunicable diseases (NCDs)	Diet-related NCDs
Diet/dietary intake	Dietary diversity/quality/consumption
Minimum dietary diversity	Dietary diversity/quality/consumption
Minimum dietary diversity for women of reproductive age	Dietary diversity/quality/consumption
Dietary diversity	Dietary diversity/quality/consumption

Sodium intake	Diet-related NCDs
Hypertension	Diet-related NCDs
Diabetes/hyperglycemia	Diet-related NCDs
Minimum acceptable diet	Dietary diversity/quality/consumption
Other	Nutrition (unspecified)
Not specified/not applicable	Not specified/not applicable
Nutrition knowledge	Nutrition knowledge

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