

## Review protocol

# The current landscape of research on World Health Assembly targets in West Africa: two interdependent review outputs

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## Administrative information

### Review title

The current landscape of research on World Health Assembly indicators in West Africa: two interdependent review outputs (a mapping review and a methodological review).

### Review timescale

**Start date:** November 2017 (initial scoping searches and topic refinement performed for 4 focal countries of TNWA including Burkina Faso, Ghana, Nigeria, and Senegal). The final protocol, which included an expanded search strategy to all West African countries, was finalized in March 2018.

**Searching updates:** February 2020 and February 2021.

**PROTOCOL AMENDMENT (March 2019):** searching updates were performed in March 2020 and March 2021.

**Expected end date:** February 2021

**PROTOCOL AMENDMENT (March 2021):** End date was revised for June 2021

### Review team detail

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### Review team members and their organisational affiliations and roles

Title	First name	Last name	Affiliation	Role
<b>Dr</b>	Roosmarijn	Verstraeten	International Food Policy Research Institute (IFPRI)	Research lead, developing protocol including the strategy, building syntax, data screening and extraction, data analysis, and drafting the publications (mapping review and methodological review)
<b>Ms</b>	Leah	Salm	Institute of Development Studies (IDS) and formerly IFPRI	Developing protocol including the strategy, building syntax, data screening and extraction, data analysis, and drafting the publications (mapping review and methodological review)
<b>Dr</b>	Nicholas	Nisbett	Institute of Development Studies (IDS)	Developing protocol including the strategy, building syntax, data screening, data analysis and drafting the publication (methodological review)
<b>Ms</b>	Loty	Diop	International Food Policy Research Institute (IFPRI)	Data screening and extraction, analysis, drafting publication (mapping review)
<b>Ms</b>	Mariama	Touré	International Food Policy Research Institute (IFPRI)	Data screening and extraction, and drafting the publication (mapping review)

<b>Dr</b>	Andrew	Booth	University of Sheffield (SchARR)	Methodological expert input and drafting the publication (methodological review)
<b>Dr</b>	Stuart	Gillespie	International Food Policy Research Institute (IFPRI)	Developing strategy, drafting the publication (mapping review)

## Conflicts of interest

None

## Funding source

This is an output of the Transform Nutrition West Africa initiative led by the International Food Policy Research Institute and funded by the Bill and Melinda Gates Foundation (BMGF). The BMGF has no role in study design; in the collection, analysis, and interpretation of data; in the writing of the evidence note and/or any other related output.

## Protocol registration

PROSPERO, the international register for systematic reviews, does not accept systematic mapping reviews, which is the category to which the present study belongs. In the interest of transparency, this protocol will be published on the Transform Nutrition West Africa website and any protocol amendments since the day published will be documented (day of change, changes, and reasons).

## Introduction

### Topic selection and refinement

#### *Stakeholder engagement*

The [Transform Nutrition West Africa](#) project is a regional platform that aims to improve and support policy and program decisions and actions to accelerate reductions in maternal and child undernutrition through an inclusive process of knowledge generation and mobilization. Recognizing that knowledge is derived from evidence and experience, TNWA takes a 'knowledge for action' approach. As such, TNWA focuses on strengthening the latter stages of the data value chain (namely analysis, translation, and dissemination for decision-making). TNWA applies evidence synthesis approaches to identify best practices on topics as prioritized by regional stakeholders. Through a regional consultation with different stakeholders (researchers, NGOs, civil society, private sector, government, UN, donor agencies) from various sectors, key priorities for future action in the region were identified. These included capturing, documenting, and learning from implementation experiences, and accelerating equitable program coverage of mother, infant and young child interventions at scale. They specifically identified the need for a better understanding of the available evidence on the World Health Assembly (WHA) targets, including a broad range of multi-faceted and multiple interventions for both U5 and WRA, and addressing various nutritional outcomes across the West African region. The output of this review will inform various stakeholders active in the region; consultations will ensure that results are fit for purpose.

## Background

The WHA 2025 nutrition targets have been used to track countries' nutritional situations, measure progress in reducing malnutrition, and guide decision making. With a little more than five years remaining to attain the WHA targets, it is a critical time to coordinate the nutrition community across policy, programmes, research towards action. West Africa is one of the regions where progress on the six WHA targets has been insufficient.

To inform policy-relevant and stakeholder-informed decision-making, TNWA applied a systematic mapping approach to identify and catalogue the existing peer-reviewed evidence on WHA targets in the region in a comprehensive and transparent way (here forth referenced as mapping review). Furthermore, building on this systematic map, we will assess the value of research on the drivers of malnutrition in the region through applying a comparative methodological approach, i.e., considering both health and social science literature (here forth referenced as methodological review).

## Methodology

### Review question

To provide an overview, catalogue and identify gaps in existing peer-reviewed literature on World Health Assembly (WHA) nutrition targets in the West African region. More specifically we will:

- Assess the peer-reviewed evidence on the WHA targets in the region to guide future primary research (mapping review)
- Assess the peer-reviewed evidence on the drivers of malnutrition from health and social science perspectives (methodological review)

### Review typology / approach







We will apply a systematic mapping review approach (James et al., 2016; Clapton et al., 2009). The PRISMA-P guidelines for protocol development will be followed (Moher et al., 2015) for both review outputs (the mapping and methodological review).

We will use the systematic map to:

- Identify the primary knowledge gaps in and priority areas for WHA targets research (mapping review) and its actors. Keeping the end-users of the results of this study in mind and maximizing its utility, we will develop this into a living systematic map which means regular searching updates to identify new research evidence.
- Employ a methodological comparative review approach. The approach seeks to identify the similarities and differences when searching for evidence in health vs. social science databases and describing the methodological ramifications and decisions when doing so (methodological review)

## Review concepts

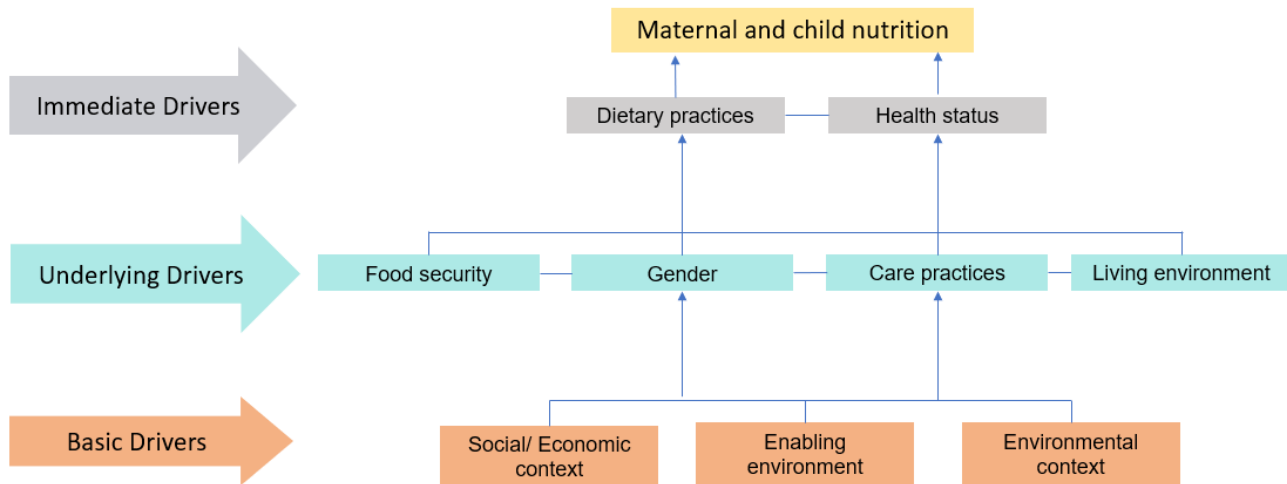
Definitions of indicators of the WHA targets used throughout both review outputs.

Category	Indicator	Definition / measurement
U5NS	<b>Stunting</b> 	<p><b>Height-for-age (HFA):</b> Height-for-age measures linear growth (stunting). A child who is below two standard deviations (-2 SD) from the median of the WHO Child Growth Standards in terms of height-for-age is considered short for his/her age or stunted.</p> <p><b>Triceps skin fold thickness</b> is used to estimate body fat, measured on the right arm halfway between the olecranon process of the elbow and the acromial process of the scapula. If a child is below minus three standard deviations (-3 SD) from the median of the WHO Child Growth Standards, then he/she is considered to be severely stunted.</p> <p><b>Stunting</b> reflects a failure to receive adequate nutrition over a long period of time and is worsened by recurrent and chronic illness. Height-for-age, therefore, reflects the long-term effects of malnutrition in a population and does not vary appreciably according to recent dietary intake</p>
U5NS	<b>Wasting</b> 	<p><b>Weight-for-height (WFH):</b> Weight-for-height describes current nutritional status. A child who is below two standard deviations (-2 SD) from the median of the WHO Child Growth Standards for weight-for-height is considered to be too thin for his/her height or wasted. This condition reflects acute or recent nutritional deficit. As with stunting, wasting is considered severe if the child is more than three standard deviations below the reference median or by a mid-upper-arm circumference less than 115 mm with or without nutritional oedema. In the presence of bilateral pitting oedema, the term kwashiorkor is used. Severe wasting is closely linked to mortality risk.</p> <p><b>Mid-upper arm circumference (MUAC)</b> measures the muscle mass of the upper arm. A flexible measuring tape is wrapped around the mid-upper arm (between the shoulder and elbow) to measure its circumference. MUAC should be measured to the nearest 0.1 cm.</p>
U5NS	<b>Overweight</b> 	<p><b>Weight-for-height (WFH)</b></p> <p>Overweight is measured as weight-for-height greater than 2 standard deviations (+2 SD) above WHO Child Growth Standards median; and obesity is weight-for-height greater than 3 standard deviations (+3SD) above the WHO Child Growth Standards median.</p>
U5NS	<b>LBW</b> 	<p><b>Low birth weight (LBW)</b></p> <p>LBW is defined as a weight of less than 2500 grams at birth</p>
EBF	<b>EBF</b> 	<p><b>Exclusive Breastfeeding (EBF)</b></p> <p>The infant receives only breast milk for the first 6 months. No other liquids or solids are given – not even water – with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines.</p>
Anaemia WRA	<b>Anaemia WRA</b> 	<p><b>Anaemia in WRA</b></p> <p>Anaemia measured by blood Hemoglobin levels.</p> <p>Hemoglobin and/or anemia prevalence below certain thresholds: lower than 110 grams per liter in pregnant women and lower than 120 grams per liter in non-pregnant women.</p>

U5NS: Under Five Nutritional Status; Source: WHO 2017 GLOBAL NUTRITION MONITORING FRAMEWORK targets for 2025 Operational guidance for tracking progress in meeting, WHO [Child Growth Standards](#), DAPA [childhood measurement toolkit](#)

### Conceptual framework for the methodological review

The [UNICEF conceptual framework](#) will be used to define the driver categories for the methodological review. In addition to the existing categories, other relevant sources are used to include drivers more specifically for overweight and obesity and for gender and enabling environment drivers in the search syntax (Bhutta et al. 2013; Gillespie et al. 2013; Smith and Haddad; 2015; Swinburn et al. 2011). Figure 1 illustrates the framework that will be used for this search.



**Figure 1: Drivers of malnutrition framework**

(Source: Created by authors, adapted from UNICEF Conceptual Framework)

## Research question framework

### PICOS framework

For the purpose of the two review outputs, we developed two different frameworks, one for the search that will be performed in MEDLINE (applicable to both review outputs) and one that will be performed in the social science database (IBSS) only.

**Table 1: PICOS Framework for MEDLINE search (Mapping review and methodological review)**

PICOS	Details
<b>Population</b>	Women of reproductive age (WRA), children under 5 years (U5), infants less than 6 months
<b>Intervention/Exposure</b>	Studies reporting on prevalence, drivers, programs, and policies
<b>Comparison</b>	Comparison group required for program studies
<b>Outcomes</b>	Anaemia in WRA, U5 stunting, U5 wasting, low birthweight, U5 overweight/ obesity and exclusive breastfeeding
<b>Setting</b>	West Africa (region and individual countries)
<b>Time frame</b>	Studies published between 2010-2020 including three searches: first search will be completed in April 2018 and updated in March 2020 and March 2021 (living systematic map).
<b>Language</b>	English, French

**Table 2: PICOS Framework for IBSS search (Methodological review)**

PICOS	Details
<b>Population</b>	Women of reproductive age (WRA), mothers, children
<b>Intervention/ exposure</b>	Drivers of malnutrition as defined by the framework (see Figure 1 for more details)

<b>Comparison</b>	No comparison needed
<b>Outcomes</b>	Nutrition outcomes such as those identified in the World Health Assembly (WHA) targets (stunting, wasting, overweight, anaemia, low birthweight, exclusive breastfeeding) as well as inclusion of broader/ more general references to nutrition, hunger, undernutrition, etc.
<b>Setting</b>	West Africa
<b>Time frame</b>	There will be no date restriction applied to this search
<b>Language</b>	English and French

## Eligibility criteria

The inclusion criteria will be based on the PICOS framework categories. Piloting will ensure that the reviews arising from the search will match the topic and expectations of the review team, and that those who will be screening share the same understanding of the criteria. A reflection on the criteria will take place, logs will be kept of decisions made, guidance will be recorded, and criteria amended if necessary.

**Table 3: Eligibility criteria for the MEDLINE database**

PICOS	Inclusion criteria	Exclusion criteria
<b>Population</b>	<ul style="list-style-type: none"> <li>Children (from singleton births) from their day of birth up until their 5th birthday (U5NS)</li> <li>Studies can include both mothers and children up to 5 years old (U5NS)</li> <li>Healthy children from singleton births (U5NS)</li> <li>Pregnant women and breastfeeding mothers with no restriction on the age of mothers (EBF)</li> <li>Infants up to the age of 6 months (EBF)</li> <li>Women of reproductive age (15-49 years old) (WRA anaemia)</li> <li>Studies that include a subpopulation of 15- to 49-year-old women (e.g., adolescent studies focusing on 12-18 years old) (WRA anaemia)</li> <li>Inclusion of both pregnant and nonpregnant women (WRA anaemia)</li> </ul>	<ul style="list-style-type: none"> <li>Exclusion of studies reporting solely on one group not included in the WHA targets, e.g., males only, elderly populations only.</li> <li>Exclusion of studies reporting on disease- specific populations (e.g., HIV positive participants only)</li> </ul>
<b>Intervention/Exposure</b>	<ul style="list-style-type: none"> <li>Problem: Studies reporting on prevalence of and/or drivers/risk factors related to U5NS, EBF, and WRA anaemia</li> <li>Programs: Programs reported as randomized controlled trials (RCTs) require having either a nutrition- sensitive or nutrition-specific objective</li> <li>Policy: Studies reporting on policy, governance, agenda, etc. This includes policy across all spectrums, e.g. government, international, organizational, hospital</li> </ul>	Exclusion of non-randomized controlled trials (such as quasi-experimental, controlled before and after studies)
<b>Comparison</b>	N/A	N/A
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Studies reporting on: HAZ, WAZ, WHZ, MUAC, skinfold, LBW (U5NS)</li> <li>Studies using Indian Academy of Paediatrics (IAP), WHO growth standards and National Center for Health Statistics references (U5NS)</li> </ul>	All other outcomes

- Studies reporting on EBF defined as “when the infant receives only breast milk. No other liquids or solids are given – not even water – with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines” (WHO, 2017) (EBF)
- Studies reporting on anaemia measured by blood haemoglobin levels. Studies need to report summary statistics on mean haemoglobin and/or anaemia prevalence below certain thresholds: lower than 110 grams per litre in pregnant women and lower than 120 grams per litre in nonpregnant women (VRA anaemia)

<b>Setting</b>	West Africa (region and individual countries)	Migrants from West Africa living outside of the region; any other country
<b>Time frame</b>	Studies published between 1999–2019	Studies published before 1999
<b>Study type</b>	Epidemiology/cohort studies, case-control studies, cross-sectional studies, comparative or descriptive studies, RCTs, qualitative studies (only for policy studies)	<ul style="list-style-type: none"> <li>• Grey literature</li> <li>• Systematic reviews</li> <li>• RCT protocols</li> </ul>
<b>Language</b>	English, French	All other languages

**Table 4: Eligibility criteria for IBSS database**

PICOS	Inclusion criteria	Exclusion criteria
<b>Participants</b>	<ul style="list-style-type: none"> <li>• General female, maternal, and child populations</li> <li>• Studies that do not name a specific population, but relate to the identified drivers</li> </ul>	Exclusion of studies reporting solely on populations other than women and children (e.g., males only, elderly populations only, HIV positive populations only)
<b>Intervention/exposure</b>	<ul style="list-style-type: none"> <li>• Immediate drivers: Studies reporting on disease, dietary factors, or physical activity that impacts nutrition</li> <li>• Underlying drivers: Studies reporting on food security, care practices, living environment, or gender</li> <li>• Basic drivers: Studies reporting on social, economic, environmental, or enabling environment context</li> </ul>	<ul style="list-style-type: none"> <li>• Exclusion of studies that do not report on at least one feature of immediate, underlying, or basic driver categories</li> <li>• Exclusion of studies that deal with technical debates within the subfields of the 3 broad driver categories</li> <li>• Exclusion of studies that are set in a historical context</li> </ul>
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>• Studies reporting on nutritional outcomes including the WHA targets (U5 stunting, U5 wasting, U5 overweight, VRA anaemia, low birthweight, VRA exclusive breastfeeding) as well as other nutrition outcomes (hunger, undernutrition, etc.)</li> <li>• Studies included if no nutrition outcome is reported in abstract but all other inclusion criteria satisfied</li> </ul>	NA
<b>Setting</b>	<ul style="list-style-type: none"> <li>• Studies that report on the West Africa region as defined by ECOWAS</li> <li>• Studies that include one of the ECOWAS countries as a comparison with non-West African countries will be included, and the individual country data extracted</li> <li>• Inclusion of regional data, national, and subnational (district, village, community)</li> </ul>	



## Search Methods

The initial search syntax will be developed in MEDLINE by using the Population, Intervention, Comparison, Outcome, and Setting (PICOS) model (Tables 1 and 2). Scoping searches will be carried out to determine the volume of the related literature relevant to the West African Region. This model will also be applied to the IBSS database, though adapted to capture the relevant social and political science literature.

- MEDLINE (biomedical/epidemiological) – For both mapping and methodological review (PubMed; <http://www.ncbi.nlm.nih.gov/pubmed>). The living systematic map will include search updates on March 2020 and March 2021.
- International Bibliography of Social Science (social/political science) – Only methodological review (IBSS; <http://www.proquest.com/libraries/academic/databases/ibss-set-c.html>)

The final search syntaxes for both databases can be found in Annex 1.

### *Quality assurance*

To assure quality throughout the mapping review, we will document systematically procedures and decisions around e.g., in/exclusion criteria, search strategies to ensure consistency and transparency in decision-making.

## Screening and study selection

The studies will be downloaded from the MEDLINE and IBSS databases and imported into the EndNote bibliography software. Here, duplicate references will be removed. Titles of studies will be screened for relevance against the pre-defined eligibility criteria. If titles are ambiguous as to the relevance, the abstract will be read. One researcher will complete this. The included studies will then be double screened by a second researcher. Any disagreements related to inclusion of studies will be discussed, and if agreement cannot be reached, a third researcher will be consulted to allow for a final decision of inclusion or exclusion.

## Data extraction

Included studies will be imported into Microsoft Excel for data extraction at abstract level. Extracted information from MEDLINE studies will include: year of publication, study language, study location (country, countries, region), study setting (national, district, village, hospital, health center), exposure/intervention (prevalence, driver, program, policy), outcome (U5 stunting, U5 wasting, U5 overweight, LWB, EBF, Anaemia in WRA), study design, drivers, intervention description (when applicable), and number of participants. Study extraction will be completed independently by two researchers.

Extracted information from IBSS studies will include: study language, study location (country, countries, region), driver free text terms, driver groupings, UNICEF driver category (immediate, underlying, basic), study setting (government/ official level, national level, community) outcomes (malnutrition, stunting, overweight etc.), study population. Study extraction will be completed by one reviewer and sample cross checked with second reviewer.

Data extraction sheets will be pilot tested on 10 abstracts, then fine-tuned prior to applying them to all included studies. A reflection on the template will take place, logs will be kept of decisions made, guidance will be recorded, and the template fine-tuned where necessary.

## Quality assessment

Within this study we will not conduct a quality appraisal of the studies but will include only peer-reviewed studies as a quality control.

## Synthesis and Analysis

The analysis will include:

### 1. Mapping review

- Narrative Synthesis using the systematic map: To provide numerical accounts of frequencies of each category, and more complex cross-tabulations to identify trends and gaps from the retrieved studies. We will analyze and assess general demographic information (publications over time, volume of publications across countries, study settings, publication types), WHA outcomes, focus of research, intervention types etc.
- Social network analysis (SNA): SNA examines the social relationships between a set of actors that, combined, make up a network. This review will utilize SNA to map out the researchers who have co-authored peer-reviewed publications on WHA targets across West Africa (based on the results of the systematic map).

### 2. Methodological review:

- Narrative Synthesis using the systematic map: To provide numerical accounts of frequencies of each category, and more complex cross-tabulations to identify trends and gaps from the retrieved studies. General demographic information (publications over time, volume of publications across countries, study settings, publication types,) nutrition outcomes, drivers etc.
- Framework synthesis: Framework synthesis offers a structured approach to organizing and analyzing data, and generally involves the preliminary identification of a priori themes against which to map data from included studies (Carroll et al., 2011) This review will utilize the UNICEF conceptual model, supplemented with additional categories to capture enabling environment, gender and overweight and obesity drivers (Swinburn et al., 2011; Bhutta and Black, 2013; Smith and Haddad, 2015; Gillespie et al., 2013). See Figure 1.

## Plans for Dissemination

Dissemination through the network generated by the Transform Nutrition West Africa project. This will include promotion in the e-newsletter, presentations of findings to Transform Nutrition West Africa partners, and online access to the database and search syntaxes.

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## Abbreviations

BMI	Body mass index
EBF	Exclusive breastfeeding
ECOWAS	Economic Community of West African States
HFA	Height-for-age
IAP	Indian Academy of Pediatrics
IDS	Institute of Development Studies
IFPRI	International food policy research institute
IYCF	Infant and young child feeding
LBW	Low birth weight
LMIC	Low- and middle- income country
MAM	Moderate acute malnutrition
NGO	Non-government organizations
RCT	Randomized controlled trial
SAM	Severe acute malnutrition
SNA	Social network analysis
TNWA	Transform nutrition west Africa
U5	Under 5
U5NS	Under 5 nutritional status
UNICEF	United nations children's fund

WASH	Water, sanitation, and hygiene
WAZ	Weight-for-age Z-scores
WFH	Weight-for-height
WHA	World health assemble
WHO	World health organization
WHZ	Weight-for-height Z-scores
WLZ	Weight-for-length Z-scores
WRA	Women of reproductive age

## Annexes

### Annex I: Search syntax

Search syntax for literature on the World Health Assembly Targets in the West Africa (WA) Region: The MEDLINE database (utilized for the mapping and methodological review)

#### Under 5 (U5) Malnutrition

Table I: U5 malnutrition – Systematic Review Search WA Region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	baby OR toddler OR babies OR girl OR boy OR “under 5 year” OR “under five year” OR neonat* OR newborn* OR enfant OR bébé OR child, preschool [MeSH]	<b>All U5 terms</b>
# 2	“height for age” OR “length for age” OR “weight for height” OR “weight for length” OR “growth disorder” OR “growth failure” OR “growth retardation” OR undernourish* OR “short stature” OR “chronic hunger” OR “dietary deficiency” OR anthropometry OR MAM OR “moderate acute malnutrition” OR SAM OR “severe acute malnutrition” OR GAM OR “global acute malnutrition” OR kwashiorkor OR undernutrition OR wasting OR stunting OR stunted OR MUAC OR “middle-upper arm circumference” OR “skinfold thickness” OR starvation OR underweight OR malnutrition OR “nutritional status” OR “low birth weight” OR marasmus OR thin OR emaciated OR emaciation OR marasme OR “body mass index” OR “BMI” OR overweight OR obese OR “weight for age”	<b>All nutrition terms</b>
# 3	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkinabé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese OR “Africa, Western”[Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	#5 and filter: systematic reviews (SR)	
#6	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 2: U5 malnutrition – Prevalence Search WA Region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	baby OR toddler OR babies OR girl OR boy OR "under 5 year" OR "under five year" OR neonat* OR newborn* OR enfant OR bébé OR child, preschool [MeSH]	All U5 terms
# 2	"height for age" OR "length for age" OR "weight for height" OR "weight for length" OR "growth disorder" OR "growth failure" OR "growth retardation" OR undernourish* OR "short stature" OR "chronic hunger" OR "dietary deficiency" OR anthropometry OR MAM OR "moderate acute malnutrition" OR SAM OR "severe acute malnutrition" OR GAM OR "global acute malnutrition" OR kwashiorkor OR undernutrition OR wasting OR stunting OR stunted OR MUAC OR "middle-upper arm circumference" OR "skinfold thickness" OR starvation OR underweight OR malnutrition OR "nutritional status" OR "low birth weight" OR marasmus OR thin OR emaciated OR emaciation OR marasme OR "body mass index" OR "BMI" OR overweight OR obese OR "weight for age"	All nutrition terms
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burkinabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	WA countries
# 4	#1 AND #2 AND #3	
# 5	epidemiology[Title/Abstract] OR incidence[Title/Abstract] OR prevalence[Title/Abstract] OR prevalence [MeSH]	All prevalence terms
# 6	#4 and #5	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	Final number to screen

Table 3: U5 malnutrition - Drivers Search WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	baby OR toddler OR babies OR girl OR boy OR "under 5 year" OR "under five year" OR neonat* OR newborn* OR enfant OR bébé OR child, preschool [MeSH]	All U5 terms
# 2	"height for age" OR "length for age" OR "weight for height" OR "weight for length" OR "growth disorder" OR "growth failure" OR "growth retardation" OR undernourish* OR "short stature" OR "chronic hunger" OR "dietary deficiency" OR anthropometry OR MAM OR "moderate acute malnutrition" OR SAM OR "severe acute malnutrition" OR GAM OR "global acute malnutrition" OR kwashiorkor OR undernutrition OR wasting OR stunting OR stunted OR MUAC OR "middle-upper arm circumference" OR "skinfold thickness" OR starvation OR underweight OR malnutrition OR "nutritional status" OR "low birth weight" OR marasmus OR thin OR emaciated OR emaciation OR marasme OR "body mass index" OR "BMI" OR overweight OR obese OR "weight for age"	All nutrition terms
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burkinabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	WA countries
# 4	#1 AND #2 AND #3	
# 5	"cohort studies"[mesh] OR "case-control studies"[mesh] OR "comparative study"[pt] OR "risk factors"[mesh] OR "cohort"[tw] OR "compared"[tw] OR "groups"[tw] OR "case control"[tw] OR "multivariate"[tw] OR "determinants" OR causes OR "risk factor*" OR "risk factors" OR risks	All Drivers terms

#6	#4 AND #5	
# 7	#6 and filter publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 4: U5 malnutrition - Programs Search WA Region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	baby OR toddler OR babies OR girl OR boy OR “under 5 year” OR “under five year” OR neonat* OR newborn* OR enfant OR bébé OR child, preschool [MeSH]	<b>All U5 terms</b>
# 2	“height for age” OR “length for age” OR “weight for height” OR “weight for length” OR “growth disorder” OR “growth failure” OR “growth retardation” OR undernourish* OR “short stature” OR “chronic hunger” OR “dietary deficiency” OR anthropometry OR MAM OR “moderate acute malnutrition” OR SAM OR “severe acute malnutrition” OR GAM OR “global acute malnutrition” OR kwashiorkor OR undernutrition OR wasting OR stunting OR stunted OR MUAC OR “middle-upper arm circumference” OR “skinfold thickness” OR starvation OR underweight OR malnutrition OR “nutritional status” OR “low birth weight” OR marasmus OR thin OR emaciated OR emaciation OR marasme OR “body mass index” OR “BMI” OR overweight OR obese OR “weight for age”	<b>All nutrition terms</b>
# 3	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkinabé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese OR “Africa, Western” [Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR placebo[tiab] OR drug therapy[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab] NOT (animals [mh] NOT humans [mh])	<b>Cochrane Hedge for RCTs</b>
#6	#4 AND #5	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 5: U5 malnutrition - Policy Search WA Region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	baby OR toddler OR babies OR girl OR boy OR “under 5 year” OR “under five year” OR neonat* OR newborn* OR enfant OR bébé OR child, preschool [MeSH]	<b>All U5 terms</b>
# 2	“height for age” OR “length for age” OR “weight for height” OR “weight for length” OR “growth disorder” OR “growth failure” OR “growth retardation” OR undernourish* OR “short stature” OR “chronic hunger” OR “dietary deficiency” OR anthropometry OR MAM OR “moderate acute malnutrition” OR SAM OR “severe acute malnutrition” OR GAM OR “global acute malnutrition” OR kwashiorkor OR undernutrition OR wasting OR stunting OR stunted OR MUAC OR “middle-upper arm circumference” OR “skinfold thickness” OR starvation OR underweight OR malnutrition OR “nutritional status” OR “low birth weight” OR marasmus OR thin OR emaciated OR emaciation OR marasme OR “body mass index” OR “BMI” OR overweight OR obese OR “weight for age”	<b>All nutrition terms</b>
# 3	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkinabé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese OR “Africa, Western” [Mesh]	<b>WA countries</b>

# 4	#1 AND #2 AND #3	
# 5	policy OR policies OR legislat* OR agenda OR regulation OR guideline* OR innovation* OR strategy OR priority OR priorities OR prioritization OR governance OR "preventive health services"[MeSH]	<b>All policy terms</b>
#6	#4 AND #5	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

### Exclusive Breastfeeding (EBF)

Table 6: EBF - Systematic Reviews in WA Region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	mothers OR women OR females OR newborn OR baby OR babies OR neonat* OR enfant OR bébé	<b>ALL Participants</b>
# 2	"lactation"[MeSH] OR "breast feeding"[MeSH] OR breastfeeding OR "first 6 months" OR "first six months" OR breastfeed* OR "care practices" OR "infant and young child feeding"	<b>All Breastfeeding terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burkina OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	#4 and Filter: systematic reviews	
#6	#5 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 7: EBF- Prevalence in WA Region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	mothers OR women OR females OR newborn OR baby OR babies OR neonat* OR enfant OR bébé	<b>ALL Participants</b>
# 2	"lactation"[MeSH] OR "breast feeding"[MeSH] OR breastfeeding OR "first 6 months" OR "first six months" OR breastfeed* OR "care practices" OR "infant and young child feeding"	<b>All Breastfeeding terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burkina OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	epidemiology[Title/Abstract] OR incidence[Title/Abstract] OR prevalence[Title/Abstract] OR prevalence [MeSH]	<b>Prevalence Terms</b>
#6	#4 and #5	
# 7	#6 Filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>



Table 8: EBF – Drivers in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	mothers OR women OR females OR newborn OR baby OR babies OR neonat* OR enfant OR bébé	<b>ALL Participants</b>
# 2	"lactation"[MeSH] OR "breast feeding"[MeSH] OR breastfeeding OR "first 6 months" OR "first six months" OR breastfeed* OR "care practices" OR "infant and young child feeding"	<b>All Breastfeeding terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Le-onean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	"cohort studies"[mesh] OR "case-control studies"[mesh] OR "comparative study"[pt] OR "risk factors"[mesh] OR "cohort"[tw] OR "compared"[tw] OR "groups"[tw] OR "case control"[tw] OR "multivariate"[tw] OR "determinants OR causes OR "risk factor*" OR "risk factors" OR risks	<b>All Drivers terms</b>
#6	#4 AND #5	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 9: EBF- Programs in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	mothers OR women OR females OR newborn OR baby OR babies OR neonat* OR enfant OR bébé	<b>ALL Participants</b>
# 2	"lactation"[MeSH] OR "breast feeding"[MeSH] OR breastfeeding OR "first 6 months" OR "first six months" OR breastfeed* OR "care practices" OR "infant and young child feeding"	<b>All Breastfeeding terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Le-onean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR placebo[tiab] OR drug therapy[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab] NOT (animals [mh] NOT humans [mh])	<b>Cochrane Hedge for RCTs</b>
#6	#4 AND #5	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 10: EBF- Policy in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	mothers OR women OR females OR newborn OR baby OR babies OR neonat* OR enfant OR bébé	<b>ALL Participants</b>
# 2	"lactation"[MeSH] OR "breast feeding"[MeSH] OR breastfeeding OR "first 6 months" OR "first six months" OR breastfeed* OR "care practices" OR "infant and young child feeding"	<b>All Breastfeeding terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA countries</b>
# 4	#1 AND #2 AND #3	
# 5	policy OR policies OR legislat* OR agenda OR regulation OR guideline* OR innovation* OR strategy OR priority OR priorities OR prioritization OR governance OR "preventive health services"[MeSH]	<b>All policy terms</b>
#6	#4 AND #5	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

#### Anaemia in Women of Reproductive Age (WRA)

Table 11: WRA Anaemia - Systematic Reviews in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	girl OR teenager OR pregnancy OR maternal OR pregnant OR "non-pregnant" OR female	<b>All Population Terms</b>
# 2	anaemia OR anemic OR anemic OR deficiency OR deficient OR "hidden hunger" OR folate OR iron	<b>ALL Anaemia terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA Region</b>
#4	#1 AND #2 AND #3	
#5	#4 and Filter: systematic reviews	
#6	#15 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 12: WRA Anaemia – Prevalence in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	girl OR teenager OR pregnancy OR maternal OR pregnant OR "non-pregnant" OR female	<b>All Population Terms</b>
# 2	anaemia OR anemic OR anemic OR deficiency OR deficient OR "hidden hunger" OR folate OR iron	<b>ALL Anaemia terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA region terms</b>
#4	#1 AND #2 AND #3	
#5	epidemiology[Title/Abstract] OR incidence[Title/Abstract] OR prevalence[Title/Abstract] OR Prevalence [MeSH]	<b>All Prevalence Terms</b>
#6	#4 AND #5	
#7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 13 WRA Anaemia – Drivers in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	girl OR teenager OR pregnancy OR maternal OR pregnant OR "non-pregnant" OR female	<b>All Population Terms</b>
# 2	anaemia OR anemic OR anemic OR deficiency OR deficient OR "hidden hunger" OR folate OR iron	<b>ALL Anaemia terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA region terms</b>
#4	#1 AND #2 AND #3	
#5	"cohort studies"[mesh] OR "case-control studies"[mesh] OR "comparative study"[pt] OR "risk factors"[mesh] OR "cohort"[tw] OR "compared"[tw] OR "groups"[tw] OR "case control"[tw] OR "multivariate"[tw] OR Determinants OR Causes OR "risk factor*" OR "risk factors" OR risks	<b>ALL driver terms</b>
#6	#4 AND #5	
#7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 14: WRA Anaemia – Programs in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	girl OR teenager OR pregnancy OR maternal OR pregnant OR "non-pregnant" OR female	<b>All Population Terms</b>
# 2	anaemia OR anemic OR anemic OR deficiency OR deficient OR "hidden hunger" OR folate OR iron	<b>ALL Anaemia terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA Region</b>
#4	#1 AND #2 AND #3	
#5	randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR placebo[tiab] OR drug therapy[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab] NOT (animals [mh] NOT humans [mh])	<b>RCT Cochrane Hedge</b>
#6	#4 AND #5	
#7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

Table 15: WRA Anaemia – Policy in WA region

Date	Database	MEDLINE
Search n°	Syntax	Notes
# 1	girl OR teenager OR pregnancy OR maternal OR pregnant OR "non-pregnant" OR female	<b>All Population Terms</b>
# 2	anaemia OR anemic OR anemic OR deficiency OR deficient OR "hidden hunger" OR folate OR iron	<b>ALL Anaemia terms</b>
# 3	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burk-inabé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese OR "Africa, Western"[Mesh]	<b>WA Region</b>
#4	#1 AND #2 AND #3	
# 5	policy OR policies OR legislat* OR agenda OR regulation OR guideline* OR innovation* OR strategy OR priority OR priorities OR prioritization OR governance OR "preventive health services"[MeSH]	<b>All policy terms</b>
#6	#5 AND #4	
# 7	#6 and filter: publication date 2010/01/01 – Language filter: English and French	<b>Final number to screen</b>

## Annex 2

Search syntax for drivers of malnutrition in the West African (WA) region: The International Bibliography of the Social Sciences (IBSS) (Methodological review)

### Immediate drivers

Table 1. Immediate drivers of malnutrition – children in WA region

Date	Database	IBSS
Search n°	Syntax	Notes
# 1	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkina-abé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese	<b>All WA Region Terms</b>
# 2	child OR children OR baby OR toddler OR preschool OR “under 5 years” OR “under five years” OR girl OR boy OR infant OR neonate OR neonatal OR newborn OR enfant OR bébé	<b>Child population Terms</b>
# 3	micronutrient OR micronutrients OR dietary OR deficiency OR “diet quality” OR “dietary intake” OR “food scarcity” OR “food shortage” OR “excessive consumption” OR disease OR morbidity OR “physical activity”	<b>Immediate drivers Terms</b>
# 4	#1 AND #2 AND #3	
# 5	Stunting OR stunted OR Wasting OR wasted OR “low birth weight” OR anemia OR anaemia OR malnutrition OR undernutrition OR overweight OR obesity OR obese OR hunger OR emaciation OR marasmus OR “moderate acute malnutrition” OR “severe acute malnutrition” OR “global acute malnutrition” OR “nutritional status” OR thin OR malnourish OR undernourished	<b>Nutrition terms</b>
#6	#4 AND #5	
# 7	ABS(#1) AND ABS(#3) AND ALL(#2) AND ALL(#5)	
# 8	#7 and filters: language English and French Peer-reviewed Date: no date restriction	
# 9	Internal duplicates removed	<b>Final Number to Screen</b>

Table 2. Immediate drivers of malnutrition – Women in WA region

Date	Database	IBSS
Search n°	Syntax	Notes
# 1	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkina-abé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese	<b>All WA Region Terms</b>
# 2	women OR women OR girls OR female OR females OR maternal OR mothers OR pregnant OR “non-pregnant”	<b>Female population Terms</b>
# 3	micronutrient OR micronutrients OR dietary OR deficiency OR “diet quality” OR “dietary intake” OR “food scarcity” OR “food shortage” OR “excessive consumption” OR disease OR morbidity OR “physical activity”	<b>Immediate drivers Terms</b>
# 4	#1 AND #2 AND #3	
# 5	anemia OR anaemia OR malnutrition OR undernutrition OR overweight OR obesity OR obese OR BMI OR hunger OR emaciation OR “nutritional status” OR thin OR malnourish* OR undernourished OR nutrition OR “mid-upper arm circumference” OR MUAC	<b>Nutrition terms</b>
#6	#4 AND #5	
# 7	ABS(#1) AND ABS(#3) AND ALL(#2) AND ALL(#5)	

# 8	#7 and filters: language English and French Peer-reviewed Date: no date restriction	
# 9	Internal duplicates removed	<b>Final Number to Screen</b>

### Underlying drivers

Table 3. Underlying drivers of malnutrition – Child population in WA Region

Date	Database	IBSS
Search n°	Syntax	Notes
# 1	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkina-abé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese	<b>All WA Region Terms</b>
# 2	child OR children OR baby OR toddler OR preschool OR “under 5 years” OR “under five years” OR girl OR boy OR infant OR neonate OR neonatal OR newborn OR enfant OR bébé	<b>Child population Terms</b>
# 3	food OR diet OR “food security” OR “food insecurity” OR “agricultural production” OR breastfeeding OR “complementary feeding” OR “care practices” OR “infant feeding” OR “infant and young child feeding” OR IYCF OR lactation OR weaning OR WASH OR sanitation OR “safe water” OR shelter OR healthcare OR “health system” OR “health infrastructure” OR gender OR “female education” OR equality OR empowerment	<b>Underlying drivers Terms</b>
# 4	#1 AND #2 AND #3	
# 5	stunting OR stunted OR wasting OR wasted OR “low birth weight” OR anemia OR anaemia OR malnutrition OR undernutrition OR overweight OR obesity OR obese OR hunger OR emaciation OR marasmus OR “moderate acute malnutrition” OR “severe acute malnutrition” OR “global acute malnutrition” OR “nutritional status” OR thin OR malnourish OR undernourished	<b>Nutrition terms</b>
#6	#4 AND #6	
# 7	ABS(#1) AND ABS(#3) AND ALL(#2) AND ALL(#5)	
# 8	#7 and filters: language English and French Peer-reviewed Date: no date restriction	
# 9	Internal duplicates removed	<b>Final Number to Screen</b>

Table 4. Underlying drivers of malnutrition – Women population in WA Region

Date	Database	IBSS
Search n°	Syntax	Notes
# 1	“West Africa*” OR Benin OR Beninese OR Beninois OR “Burkina Faso” OR Burkina-abé OR “Cape Verde” OR “Cabo Verde” OR “Cabo Verdean” OR “Cote d’Ivoire” OR “Ivory Coast” OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR “Guinea-Bissau” OR “Guinée-Bissau” OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR “Sierra Leone” OR “Sierra Leonean” OR Togo OR Togolese	<b>All WA Region Terms</b>
# 2	women OR women OR girls OR female OR females OR maternal OR mothers OR pregnant OR “non-pregnant”	<b>Female population Terms</b>
# 3	food OR diet OR “food security” OR “food insecurity” OR “agricultural production” OR breastfeeding OR “complementary feeding” OR “care practices” OR “Infant feeding” OR “Infant and young child feeding” OR IYCF OR Lactation OR weaning OR WASH OR sanitation OR “safe water” OR shelter OR healthcare OR “health system” OR “health infrastructure” OR gender OR “female education” OR equality OR empowerment	<b>Underlying drivers Terms</b>
# 4	#1 AND #2 AND #3	

# 5	anemia OR anaemia OR malnutrition OR undernutrition OR overweight OR obesity OR obese OR BMI OR hunger OR emaciation OR "nutritional status" OR thin OR malnourish* OR undernourished OR nutrition OR "mid-upper arm circumference" OR MUAC	<b>Nutrition terms</b>
#6	#4 AND #6	
# 7	ABS(#1) AND ABS(#3) AND ALL(#2) AND ALL(#5)	
# 8	#7 and filters: language English and French Peer-reviewed Date: no date restriction	
# 9	Internal duplicates removed	<b>Final Number to Screen</b>

#### Basic drivers

Table 5. Basic drivers of malnutrition – Child population in WA Region

Date	Database	IBSS
Search n°	Syntax	Notes
# 1	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burkina-abé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese	<b>All WA Region Terms</b>
# 2	child OR children OR baby OR toddler OR preschool OR "under 5 years" OR "under five years" OR girl OR boy OR infant OR neonate OR neonatal OR newborn OR enfant OR bébé	<b>Child population Terms</b>
# 3	poverty OR "socioeconomic status" OR "socio-economic status" OR income OR wealth OR inequality OR "enabling environment" OR "capacity" OR "capacity building" OR resource* OR "resource mobilization" OR financ* OR budget* OR politic* OR governance OR corruption OR leadership OR policy OR advocacy OR "agenda setting" OR Urbanization OR globalisation OR globalization OR "obesogenic environment" OR "climate change" OR vulnerability	<b>Basic drivers Terms</b>
# 4	#1 AND #2 AND #3	
# 5	stunting OR stunted OR Wasting OR wasted OR "low birth weight" OR anemia OR anaemia OR malnutrition OR undernutrition OR overweight OR obesity OR obese OR hunger OR emaciation OR marasmus OR "moderate acute malnutrition" OR "severe acute malnutrition" OR "global acute malnutrition" OR "nutritional status" OR thin OR malnourish OR undernourished	<b>Nutrition terms</b>
#6	#4 AND #6	
# 7	ABS(#1) AND ABS(#3) AND ALL(#2) AND ALL(#5)	
# 8	#7 and filters: language English and French Peer-reviewed Date: no date restriction	
# 9	Internal duplicates removed	<b>Final Number to Screen</b>

Table 6. Basic drivers of malnutrition – Women population in WA Region

Date	Database	IBSS
Search n°	Syntax	Notes
# 1	"West Africa*" OR Benin OR Beninese OR Beninois OR "Burkina Faso" OR Burkina-abé OR "Cape Verde" OR "Cabo Verde" OR "Cabo Verdean" OR "Cote d'Ivoire" OR "Ivory Coast" OR Ivorian OR Gambia OR Gambian OR Ghana OR Ghanaian OR Guinea OR Guinée OR Guinean OR "Guinea-Bissau" OR "Guinée-Bissau" OR Liberia OR Liberian OR Mali OR Malian OR Niger OR Nigerien OR Nigeria OR Nigerian OR Senegal OR Senegalese OR "Sierra Leone" OR "Sierra Leonean" OR Togo OR Togolese	<b>All WA Region Terms</b>
# 2	women OR women OR girls OR female OR females OR maternal OR mothers OR pregnant OR "non-pregnant"	<b>Female population Terms</b>

# 3	poverty OR "socioeconomic status" OR "socio-economic status" OR income OR wealth OR inequality OR "enabling environment" OR "capacity" OR "capacity building" OR resource* OR "resource mobilization" OR financ* OR budget* OR politic* OR governance OR corruption OR leadership OR policy OR advocacy OR "agenda setting" OR urbanization OR globalisation OR globalization OR "obesogenic environment" OR "climate change" OR vulnerability	<b>Basic drivers Terms</b>
# 4	#1 AND #2 AND #3	
# 5	anemia OR anaemia OR malnutrition OR undernutrition OR overweight OR obesity OR obese OR BMI OR hunger OR emaciation OR "nutritional status" OR thin OR malnourish* OR undernourished OR nutrition OR "mid-upper arm circumference" OR MUAC	<b>Nutrition terms</b>
#6	#4 AND #6	
# 7	ABS(#1) AND ABS(#3) AND ALL(#2) AND ALL(#5)	
# 8	#7 and filters: language English and French Peer-reviewed Date: no date restriction	
# 9	Internal duplicates removed	<b>Final Number to Screen</b>



## Annex 3

### Rapid Review Protocol checklist: recommended items to address in a rapid review protocol (ref: rapid review guidebook and template TNWA)

Checklist item	Page number
<b>Administrative information</b>	
<i>Title:</i> Informative title indicating that this is a protocol	2
<i>Registration:</i> Details of Protocol Availability Clear indication of protocol document status Identify any updates/changes made to the protocol	2, 3
<i>Authors:</i> Identification of Review Team	2, 3
<i>Conflict of interest</i>	3
<b>Introduction</b>	
<i>Topic selection and refinement</i> Details on stakeholders and the stakeholder engagement Describe the background to the specific topic selected	3
<i>Research question</i> Describe the research question (free text) Detail the research question using the elements of a question framework Include the relevant definitions for the topic and/or the framework used for the rapid review (if applicable)	4, 5, 6, 7
<b>Methods</b>	
<i>Overall Review typology</i> State the method applied to the rapid review	4
<i>Eligibility Criteria</i> List the eligibility criteria using the questions framework elements	7, 8, 9
<i>Searching for evidence</i> State the search methods applied, including information sources and the search strategy	9
<i>Screening and study selection</i> State the methods of screening and study selection including data management	9
<i>Data extraction</i> State the data extraction procedures, including variables for which data will be extracted	9
<i>Quality assessment</i> If applied in the rapid review, report the quality assessment (risk of bias) tools applied	10
<i>Knowledge synthesis</i> Describe the methods of synthesis and analysis	10
<b>Dissemination</b>	
<i>Report production and dissemination</i> Plans for output and dissemination	11

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