

SAVING  
LIVES  
CHANGING  
LIVES



## A REVIEW OF SCHOOL-BASED INTERVENTIONS ADDRESSING THE HEALTH AND NUTRITION OF SCHOOL-AGED CHILDREN IN THE WEST AFRICA REGION

*July 2021*

Commissioned by

**WFP Regional Bureau, DAKAR**

Prepared by



## Acknowledgements

This report on the Review of school-based interventions addressing the health and nutrition of school-aged children in West Africa is one of three regional studies conducted by the Centre for Learning on Evaluation and Results – Anglophone Africa (CLEAR-AA) for the World Food Programme (WFP) Regional Bureaux (Dakar, Johannesburg and Nairobi). Dr Robert Akparibo is the author and lead researcher for the West Africa study. The design of the study was a collective effort of the CLEAR team that included Dr Kalkidan Hassen Abate and Aislinn Delany, the lead researchers for the East and Central Africa study and the Southern Africa study, respectively and Dr Steven Masvaure. Shakilah Syed provided research assistance for the three studies and Angela Bester coordinated the research and the drafting of the regional reports.

CLEAR-AA extends its gratitude to Agnesndiaye Faye and the staff of the World Food Programme (WFP) Regional Bureau, Dakar for their guidance and constructive comments on the research and the drafts of the report. We also thank Trixie-Belle Nicolle of the WFP Regional Bureau, Johannesburg for her capable coordination of the three regional studies, and for facilitating the team's engagements with the respective WFP Regional Bureaux.

## Contents

Acknowledgements.....	ii
Contents.....	iii
Executive Summary.....	v
1 Introduction .....	11
1.1 Background .....	11
1.2 Purpose, scope and objectives of the regional review .....	12
1.3 Methodological approach and limitations.....	13
1.4 General limitations of the review .....	14
1.5 Structure of the report .....	14
2 Regional context .....	16
2.1 Socio-economic context .....	16
2.2 Food security and nutrition in the region.....	16
2.3 HIV in the region .....	20
3 Health and nutrition status of school-aged children .....	22
3.1 State of health and nutrition of school-aged children .....	22
4 School-based health and nutrition interventions.....	31
4.1 Extent of school-based health and nutrition interventions in West Africa .....	31
4.2 Policy and Legal frameworks supporting school-based health and nutrition interventions.....	32
5 Mapping of stakeholders involved in school-based Health and nutrition .....	33
6 Effectiveness of school-based health and nutrition interventions: a systematic evidence synthesis.....	37
6.1 School-based nutrition interventions .....	37
6.2 HIV interventions.....	46
6.3 Findings.....	46
7 Challenges and gaps.....	56
7.1 Lack or inadequate funding and corruption .....	56
7.2 Food insecurity and lack of food-based-dietary guidelines.....	56
7.3 Capacity/expertise and the school environment .....	57
7.4 Community engagement/participation .....	57
7.5 Lack of WASH facilities and sub-optimal intervention delivery.....	58
8 Conclusions and lessons learned .....	59
8.1 Conclusions .....	59
8.2 Key lessons.....	60
References .....	62
Acronyms .....	70
Annex A: Methodology .....	71
Annex B: School feeding programmes in West Africa region.....	79

Annex C: Stakeholders: WFP West Africa Region .....	88
Annex D: Summaries of findings of studies reviewed .....	96

## **TABLES**

Table 1: Summary of Theory of Change.....	11
Table 2 Methodological approaches used in assignment.....	13
Table 3: Prevalence of under-nourishment and food security by country, West Africa .....	17
Table 4: Prevalence of under-weight, stunting and overweight under-5 years, by country, West Africa .....	18
Table 5: Prevalence of obesity in adults and anaemia in women of reproductive age, by country, West Africa .....	19
Table 6 Prevalence of HIV among young people 15-24 years, by country, in West Africa.....	20

## **FIGURES**

Figure 1 School Health and Nutrition Framework.....	13
Figure 2 Prevalence of infectious diseases among school-aged children 5-19 years (GBD, 2019) .....	24
Figure 3 Prevalence of nutritional problems among school-aged children 5-19 years (GBD, 2019).....	25
Figure 4 Proportion of thinness (thin/severe thin) and overweight/obesity in children age 5-19 years (UNICEF, 2019).....	26
Figure 5 Prevalence of intestinal worms among school-aged children 5-19yrs (GBD, 2019)..	27
Figure 6 Trend in all-cause mortality of children aged 5-14 years (UNICEF, 2019).....	28
Figure 7 Trend in all-cause mortality (Child per 1000) among school-aged children 15-19 years (UNICEF, 2019). .....	29

## Executive Summary

### Introduction

The World Food Programme (WFP) Regional Bureaux of East and Central Africa, Southern Africa and West Africa commissioned this review in 2020 to generate evidence on the state of health and nutrition of school age children and adolescents in Sub-Saharan Africa. The Regional Bureaux intend to use the information to develop plans for implementing the WFP School Feeding Strategy 2020-2030. Through these plans, the WFP Regional Bureaux aims to support governments of Sub-Saharan countries to design and deliver evidence-based policy interventions to improve the health and nutrition of school-aged children and adolescents. This report presents the review and synthesis of the literature for West Africa, covering 20 countries (Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d'Ivoire, Cape Verde, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Sao Tome and Principe, Senegal, and Togo).

The review conducted i) an analysis of the regional situation of health and nutrition of school-aged children and adolescents, ii) systematic evidence synthesis of published academic and grey literature to evaluate the potential impact of existing school-based health and nutrition (covering school feeding, micronutrient supplementation, nutrition education, deworming, HIV and Water Sanitation and Hygiene (WASH)) interventions on the health and nutrition of the target children, iii) review of existing policies or legal frameworks that guide and support the design and delivery of school-based health and nutrition interventions, and iv) mapping of stakeholders involved/support the development and delivery of school-based health and nutrition interventions in West Africa.

### Methods

A mixed methods approach was employed. This involved desktop and systematic reviews, secondary data analysis, and policy and stakeholder mapping exercises. The situation of school health and nutrition of school-aged children and adolescents (5-19 years) in West Africa was assessed using existing published literature/reports, complemented with secondary data we accessed from the Global Burden of Diseases (GBD) database, managed by United Nations Children Fund (UNICEF), and the UNICEF Specific data on child mortality. The impact of existing interventions on health, nutrition and education of school age children and adolescents was investigated through a systematic review of existing evidence. Relevant literature for the systematic review were accessed from academic databases (MEDLINE, EMBASE, CIHNAL, Web of Science, PsychInfo, the Cochrane databases of systematic reviews, and Google Scholar) and grey literature sources including websites of the World Health Organization (WHO), Food and Agricultural Organization (FAO) and World Food Programme (WFP), as well as relevant government health and education ministries. We had initially planned to conduct a meta-analysis of the statistical data extracted from the existing studies to determine the overall pull effect size of the evidence, but this was not possible because of the heterogeneous nature of the available literature.

### Key findings

#### Health and nutrition situation of school-aged children and adolescents

The burden of infectious diseases (malaria, sexually transmitted diseases (STDs), excluding HIV, and upper respiratory infections) and malnutrition (thinness and stunting) remain high, although our analysis shows a decreasing mortality over the last 10 years. Malaria prevalence, generally

remains high, especially in Liberia, Sierra Leone, Benin republic, Guinea, Niger, Cote d'Ivoire, Burkina Faso and Togo, where the prevalence is above the regional average of 24 percent. In terms of the nutrition status of children and adolescents, micronutrient deficiencies pose the biggest nutritional threat. Dietary-iron, followed by vitamin A deficiencies were the two micronutrient deficiencies that affect children and adolescents the most. The prevalence of dietary-iron deficiency, across many countries in the region, was higher than the West Africa regional average. HIV and lower respiratory infections have much lower prevalence levels for children 5-19 years, than other infectious diseases.

Limited data are available to estimate the burden of stunting and underweight/thinness for school age children and adolescents (aged 5-19 years). However, the data on overweight and obesity show a slightly higher rate (above the West and Central Africa sub-regional, and the Sub-Saharan regional averages) in 13 countries. We found a high burden of parasitic (hookworm, Ascariasis and Trichuriasis) infections, with hookworm infection being the most prevalent, especially in Guinea Bissau, Chad and Togo.

Data from the UNICEF/WHO Joint Monitoring Programme (JMP) indicates modest to poor coverage of water supply and sanitation services in schools in the region. Only seven countries appear to have made progress in terms of water and sanitation provisions in schools (more than 70 percent coverage). There was no data to assess hygiene service status in 10 countries.

### **Impact of school nutrition (school feeding, nutrition education and deworming) interventions**

We found mixed evidence showing the effect of school-based nutrition interventions on the nutritional, health and educational improvements among school-aged children and adolescents. For nutritional outcomes, while a reasonable number of the studies found a positive effect of school-feeding on linear growth and increasing weight (addressing thinness) among children who received school feeding compared with those who did not, other studies reported no significant differences. For the studies that found positive effect, the results show that younger, compared to older children in low-income households were more likely to experience greater weight gain and linear growth.

For education outcomes, the evidence suggests that school-based nutrition interventions, which include school feeding, micronutrients supplementation and nutrition education, show greater benefits in increasing school enrolment, attendance, and reducing attrition in school feeding schools compared with no school feeding. We found no evidence demonstrating the impact of such interventions on academic achievement, but this could be due to the limited number of studies that examined this outcome.

For deworming interventions, the evidence appears to suggest that they can contribute to reducing the risk of parasitic infections, and potentially reduce school absenteeism. However, because of the limited number of studies we are unable to draw firm conclusions.

### **Impact of HIV interventions**

We found no data reporting on the direct effect of school-based HIV interventions in improving the health, nutrition and education of school-aged children and adolescents. The evidence available focused primarily on HIV knowledge, awareness, and behaviour and attitudinal change towards HIV risk perception and prevention practices. Evidence from 10 studies found a strong association between school-based HIV interventions and increase HIV awareness and knowledge among adolescents in intervention schools. Evidence from seven studies demonstrate impact in reducing adolescent risk-taking sexual behaviour, and positive attitudes towards HIV prevention, such as condom use or intention to use in the future, delayed initiation of sexual activities and

having fewer sexual partners. A reasonable number of studies also reported reduced risk perception and reduced vulnerability of adolescents to HIV and sexually transmitted infections. The evidence further suggests that peer-education as an HIV prevention approach could increase self-esteem and sexual assertiveness of adolescents.

Although we found only three studies assessing the impact of school-based HIV intervention on education outcomes (attendance and academic performance), and the evidence reported demonstrated some benefits. The findings show a slight increase in student enrolment, and mean exam scores were high.

However, given the limited HIV interventions studies in the region overall, we are unable to draw firm conclusions on the effectiveness of HIV intervention on educational outcomes. Overall, the review findings suggest that there is a window of opportunity for further studies, using randomised trials designs, to evaluate the impact of HIV interventions in schools more robustly – especially the impact of such interventions on improving health and educational outcomes of school-aged children and adolescents.

### **Impact of Water, Sanitation and Hygiene (WASH)**

We found mixed evidence of impact of school-based WASH interventions on the health and education of school-aged children and adolescents. We found evidence in five studies demonstrating that the interventions led to a significant reduction in diarrhoeal disease and other hygiene-related diseases, such as respiratory illness and soil-transmitted helminths, but not parasitic or vector transmitted disease (intestinal parasite infections).

The effect of school-based WASH intervention on reducing parasitic diseases was modest. The difference in results between intervention schools and control schools was not statistically significant. The evidence also suggests that WASH interventions have made little to no impact in improving education outcomes. In two studies for example, we found no evidence suggesting that school-based WASH intervention can improve enrolment, school attendance, or leads to a reduction in school absenteeism. There is however evidence that school-based WASH interventions improve handwashing knowledge and skills. In three studies, the frequencies of handwashing before eating a meal and after visiting a toilet facility improved among students in all intervention schools.

We found evidence that suggest that menstrual hygiene management (MHM) education implemented among adolescents in schools shows promising results, including positive attitudes of boys towards menstruating girls, and improved personal hygiene practices among girls.

However, similar to the HIV interventions, it is difficult to draw firm conclusions regarding impact of WASH interventions on education outcomes when studies are either limited to a few countries or are non-existent.

### **Policies and legal framework**

The evidence from the policy review and mapping exercise suggest that most West African countries have policies or if not at all, strategies have been developed, to guide and support the development and implementation of health and nutrition interventions more generally. However, the majority of these policies/strategies are not school-based nutrition policies specific. Only few countries have published school-based health and nutrition specific policies/strategies, and although these policies are being use to guide the development and implementations of nutrition interventions in schools, they provide no guidance that sets out the percentage of total nutrient or caloric needs that school meals should contribute (or guide menu planning).

## Challenges and Gaps

- i. Financial capacity of governments to fund the implementation of school-based interventions is a challenge. In many countries this has been attributed to the non-availability of essential WASH facilities/ commodities such as safe drinking water within the school environment, and lack of resources to effectively cover sexual and HIV topics in the curriculum have also been identified as key barrier to effective implementation. Most countries in the region have not been able to expand on their educational infrastructure because of lack of funding. For example, most West African governments have been unable to increase the number of classrooms to accommodate the increase in students' numbers resulting from school feeding or purchase essential teaching and learning materials to facilitate effective teaching and learning.
- ii. Increased prevalence of food insecurity in many West African countries was also identified as a major setback to the smooth implementation of school feeding programmes. For instance, food insecurity has led to irregular food supply to schools, and in some context (Ghana and Nigeria) studies have highlighted that some schools resort to buying "cheaper unwholesome foodstuffs" from private local food suppliers ("middle men") that supply both locally produced foods procured from local farmers, and foods they imported from foreign countries. These measures consequently undermine the nutritional (nutrient) quality of the meals that children are served at school.
- iii. An important challenge is also the lack of school nutrition-specific policies in some West African countries and the lack of food-based dietary guidelines (all countries) to guide intervention development and implementation to meet targets. Only few countries within the region (Ghana, Nigeria, Mali, Mauritania, Chad, Cote D'Ivoire, Guinea, Togo and Cameroon) have school-based nutrition-specific policies and or strategies (e.g. school-feeding policies) to guide implementation of national school feeding programmes. The few school-feeding policies that exists (only 8 countries), provide no guidance on nutrients requirements for children to guide menu planning, to ensure that children are eating a diet that is nutritionally balanced.
- iv. General lack of capacity or expertise by education authorities or school leadership (including teachers) to perform effective monitoring and supervision of the implementation of school-based health and nutrition interventions results in a lack of accountability by some school authorities for funds allocated to them to run school-based interventions. In the case of school HIV prevention programmes, it has been highlighted that majority of teachers lack capacity and skills to discuss sexual health issues with their students, including measures to prevent HIV such as condom use. In addition to the knowledge and skills barriers, the school environment has been noted as being at odds with what the programme aims to strengthen. For instance, how boys and girls are treated within the school social environment by their male and female teachers, as well as the gender and status power differentials between teachers and learners, has been observed as a factor influencing overall programmes adherence.
- v. Engaging community members to support and participate in the development, implementation, and monitoring/supervision is an important component of the school-feeding programme model. A low or lack of involvement from community members in these activities could have a negative impact on the overall success of school feeding interventions. For example, a few Ghanaian studies have identified poor involvement and participation of community members/leaders in the monitoring of school feeding activities within their communities as a major challenge contributing to the lack of school feeding programme success.



- vi. More generally, for WASH interventions, the multiple burden of disease rates (co-morbidity), pathogen-pathways within the school and home environments, increasing student populations, and baseline WASH conditions such as water unavailability, and the broader social, political and economic issues have been identified and discussed as issues that need to be carefully addressed, if WASH interventions are to be effective.

## **Conclusions and lessons learned**

### **Conclusions**

This review was designed to synthesise evidence from published literature on the impact of school-based health (HIV, WASH and deworming) and nutrition (school-feeding, micronutrients supplementation and nutrition education) interventions on the health, nutritional and educational outcomes among school-aged children and adolescents. We found evidence suggesting that school-based nutrition interventions are effective in increasing school enrolment, attendance and retention in West Africa. We found no evidence demonstrating the impact of such interventions on academic achievement, but this could be due to the limited number of studies that examined this outcome.

For HIV interventions, we did not find any studies examining the link between school-based HIV interventions and the health and nutrition status of school-aged children and adolescents. The evidence available focused primarily on HIV knowledge, risk perception and behaviour and attitudinal change towards HIV and its prevention practices. We found evidence demonstrating a strong link between school-based HIV interventions and adolescents' HIV awareness, increased knowledge and positive sexual behaviours, as well a significant reduction in HIV risks perceptions.

In the case of WASH interventions, we found mixed evidence linking these interventions to the health and education of school-aged children and adolescents. All the included studies that were reviewed demonstrated positive impacts in terms of reduction of WASH related diseases such as diarrhoeal and respiratory illness, and soil-transmitted helminths. For deworming interventions, although the evidence appears to suggest that they have the potential to reduce the risk of parasitic infections that could subsequently lead to a reduction in school absenteeism, there were limited studies in the West Africa region to review to draw such a conclusion.

Given the limited studies in the region we are unable to draw firm conclusions on the effectiveness of these school-based interventions. Overall, the review findings suggest that there is a window of opportunity for further studies, using randomised trials designs, to evaluate impact of HIV and WASH interventions in schools more robustly – especially the impact of such interventions on improving health and educational outcomes for school-aged children and adolescents.

### **Lessons learned**

The review identified several lessons that the WFP Regional Bureau in Dakar may wish to consider in the development of plans for the implementation of the WFP Global School Feeding Strategy in countries in the West Africa region:

- (a) School-based health and nutrition interventions can bring more children to schools, but their benefits can be better harnessed if marginalised and vulnerable groups including girls and orphans are prioritised. Interventions should also be inclusive of children and adolescents in deprived urban and rural communities, where school enrolments are usually low, and should ensure that no child or adolescent is left behind.
- (b) Increased enrolment resulting from school feeding programmes poses threats to the already overstretched government resources of West African states. This may impact on governments' ability to meet any growing enrolment demand, as well as the

sustainability of the school feeding programmes they have established. Stronger partnerships with other development actors, including the private sector and philanthropic organizations, are crucial to addressing increasing demand for school enrolment, and the sustainability of school-based health and nutrition interventions. Partnerships with communities where school-based interventions are implemented are also important for the sustainability of these interventions.

- (c) Children enrolled in schools as a result of school feeding programmes are more likely to remain and complete school if their expectations and the expectations of their parents about the quantity and quality of meals served to children are met. Prioritising and addressing these issues are essential to maximising the documented benefits of school feeding programmes.
- (d) An important lesson is that culturally appropriate food provided as school meals is paramount to achieving school feeding effectiveness and long-term sustainability. This can be achieved by engaging and encouraging the participation of community members (local farmers) to produce and supply local foodstuff to schools that are involved in school feeding.
- (e) Teachers, parents and school staff all play crucial unique roles towards the running of school health and nutrition programmes. Therefore, engaging them and building their capacity to perform their respective roles can contribute to maximising the benefits of school-based interventions. It is also essential that the roles of teachers in school-based interventions are clear, particularly in HIV prevention interventions. The review revealed that there is no clear guidance and that school authorities are often unsure whether HIV prevention interventions should be the duty of teachers, or whether it should be left to specialised health professionals. Trained schoolteachers, supported by specialised health professionals that rotate across schools, could be considered.
- (f) Peer, teacher, and parent-led education approaches, digital storytelling and classroom instructions incorporating drama sessions are important HIV prevention strategies to enhance adolescents' positive sexual and HIV risk perception and knowledge/awareness. A combination of regular classroom instructions and drama yields more positive outcomes in both knowledge gained and in attitudinal change among in-school adolescents than classroom instructions alone.
- (g) School-based health and nutrition interventions can be more effective if they are designed and implemented as integrated interventions as opposed to being disconnected, parallel interventions. For example, combining deworming interventions with an integrated WASH intervention can address the problem of repeated parasitic re-infection after treatment.
- (h) Financial investments are needed to support capacity building of teachers and strengthen school monitoring and evaluation systems to facilitate delivery and effectiveness of school-based interventions. This can be achieved through partnerships with the private sector but also with governments' development partners. The effectiveness of school-based health and nutrition interventions and the sustainability of the results achieved are greatly influenced by the conditions in the broader environment. It is essential to take the local context into account when designing and implementing school-based health and nutrition interventions.

## 1 Introduction

### 1.1 Background

1. Poor health, prevalent among learners/students from disadvantaged communities, has a significant effect on education and is the cause of absenteeism that contributes to grade repetition, early school leaving, and poor education outcomes. Many of the poor health conditions of learners/students are preventable and treatable through an essential integrated package of health and nutrition services. The school system is potentially a cost-effective platform for delivering an integrated package of health and nutrition services to schoolchildren in rural and poor areas as these areas more likely to have schools than health centres.
2. WFP has been supporting school feeding for the past six decades. According to WFP's analysis of available evidence, school feeding is the costliest element of an integrated package of health and nutrition services but is cost-effective because of the multiple benefits generated. WFP's cost-benefit analysis of national school feeding programmes and WFP programmes found that every USD 1 invested in school meals programmes yields an economic return of USD 3-10 from improved health, education, and productivity.<sup>1</sup>
3. As human capital development of children is vital for a country in many ways, investing in it has proven to help children achieve their best as well as create productivity, stability and improve resilience in communities. WFP launched its School Feeding Strategy in 2020, which entails the new approach taken by WFP to ensure that all school-going children receive a good quality meal and an integrated package of nutrition and health. This strategy also reaches out to government and partners to help in addressing gaps in guaranteeing a proper school health and nutrition response for children in schools. The new strategy recognizes the necessity for WFP to work collaboratively with other agencies, governments, and stakeholders in delivering an integrated response to contribute to the achievement of the Sustainable Development Goals (SDGs), particularly Goals 2, 3 and 17.
4. **Theory of change.** The strategy is built on a Theory of Change that guides monitoring and evaluation of the strategy. The Theory of Change sets out the vision, purpose, strategy outcomes, assumptions and drivers of change, and links these to WFP's corporate strategic objectives and strategic results, and the SDGs. Key elements of the Theory of Change are set out below:

**Table 1: Summary of Theory of Change**

<b>Vision</b>	All vulnerable children are free from hunger and are well nourished and healthy, so they can learn and reach their full potential, thus benefiting their own development and wellbeing, and that of their families and communities
<b>Purpose</b>	All children have improved access to school feeding as part of the essential school health and nutrition package contributing to increasing human capital and economic growth, education and learning, food systems and healthy diets
<b>Strategy outcomes</b>	1. All vulnerable children in crisis-affected countries are covered by high-quality school feeding programmes implemented by WFP and delivered in partnerships

<sup>1</sup> WFP. 2020. A chance for every child: Partnering to scale up school health and nutrition for human capital, January 2020, p.20

	<p>2. All vulnerable children in lower-MICs are covered by high-quality school feeding government programmes and supported by WFP (WFP hands over operational support services)</p> <p>3. All vulnerable children living in extreme poverty in MICs are covered by optimized higher-quality national school feeding programmes</p>
--	--

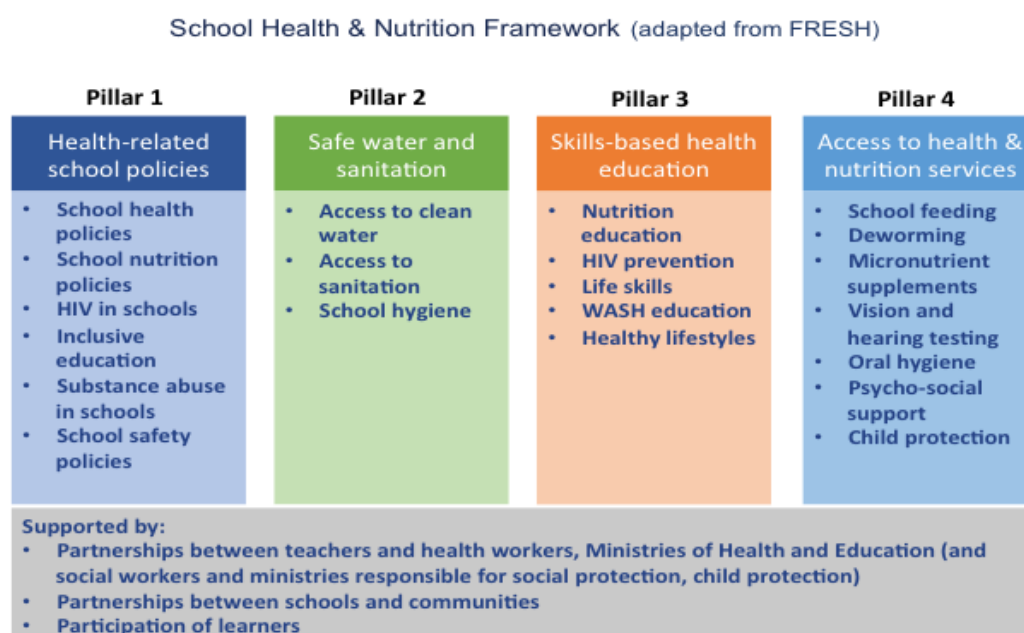
Source: WFP School Feeding Strategy, January 2020

5. **Context-specific approach:** According to the strategy, WFP will work closely with governments and partners by using a context-specific approach to ensure that primary school children have access to good quality meals in school as well as receiving an integrated package of nutrition and health.

## 1.2 Purpose, scope and objectives of the regional review

6. The WFP Regional Bureaux of East & Central Africa, Southern Africa and West Africa appointed the Centre for Learning on Evaluation Results Anglo-phone Africa (CLEAR-AA) to conduct a review of the literature on school-based interventions addressing the health and nutrition status of school-aged children in Sub-Saharan Africa. The Regional Bureaux require the information to develop plans for implementing the WFP School Feeding Strategy 2020 - 2030. This report presents the results of the review for the WFP West Africa region.
7. The specific objectives of the review were to:
- i. Develop an analysis of the regional situation of health and nutrition of school-aged children, and undertake a review of evidence to understand the effectiveness of school-based health and nutrition interventions on the health, nutrition and education of the target children.
  - ii. Using evidence from the situation analyses and evidence review, highlight lessons learned and best practices, challenges and gaps in the implementation of school health and nutrition interventions in the West African region.
  - iii. Examine the existing policy and legal framework for school health and nutrition in Sub-Saharan Africa.
  - iv. Conduct a regional stakeholder mapping and analysis. This should include an analysis of regional bodies and their position on the issue in the region and an analysis of United Nations agencies and main partners and their position on the issue in the region.
8. The report focuses on the 20 countries that fall within the West Africa region as defined by WFP. Several countries categorised as Central Africa by other United Nations agencies are included in the group of countries covered by the WFP Regional Bureau in Dakar. The countries covered by the review were: Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Cote d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, and Togo.
9. School health and nutrition covers a wide range of school-based interventions for example, school feeding, health checks (visual and hearing tests), vaccinations, Water, Sanitation and Hygiene (WASH), health education, and HIV prevention education (Figure 1). During the inception process, it was agreed with WFP that the first phase of the assignment would focus on school-based nutrition; covering school feeding, micronutrients supplementation, and nutrition education interventions, and deworming interventions. The second phase of the study covered school-based HIV and WASH interventions

**Figure 1 School Health and Nutrition Framework**



Source: UNESCO, UNICEF, WHO, World Bank and Education International Inter-agency Flagship Programme (2002) on Focusing Resources on Effective School Health (FRESH)

### 1.3 Methodological approach and limitations

10. The team adopted mixed methodological approaches to collect and analysed data from both secondary data sources and existing published literature to address the specific objectives of the assignment. These approaches are summarised in Table 2. The detailed methodology for the systematic review of academic and grey literature is set out in Annex A.

**Table 2 Methodological approaches used in assignment**

Component of assignment	Approach	Main data sources
<b>Analysis of regional situation of health and nutrition of school-aged children</b>	Descriptive statistical analysis of trends and prevalence of health and nutrition problems, and mortality	Global Burden of Diseases database (IHME, 2010) UNICEF data on mortality (2019)
<b>Effectiveness of school-based health and nutrition interventions</b>	Systematic review of academic literature and grey literature, and meta-analysis where appropriate	African Index Medicus, Campbell Collaboration, DOPHER, EMBASE, PubMed, Cochrane Library, Trial registers, Web of Science. Grey literature sourced through Google Scholar, government and institution websites.
<b>Policy and legal frameworks for school health and nutrition</b>	Mapping of policies of countries in the region, as well as policies of regional institutions	Websites of country governments and websites of United Nations entities
<b>Stakeholders and their positions</b>	Mapping of stakeholders: United Nations entities in the region, regional economic	Websites of United Nations entities, regional economic

	communities, and civil society organizations.	communities, and civil society organizations
--	---	--

## 1.4 General limitations of the review

11. An important limitation of this study was that, although the review covered all the WFP operating countries: the English, French, and Portuguese speaking countries in West Africa, only literature that were available in English were examined as none of the team members were conversant French and Portuguese. Evidence published in these languages might have been missed.
12. Although studies included in the systematic review were from eight West African countries (Ghana, Nigeria, Mali, Burkina Faso, Cameroon, Niger, and Cote d'Ivoire, and Liberia) a key limitation was that the majority of these studies were from four countries (two Anglophone: Nigeria & Ghana, and two Francophone: Mali and Burkina Faso). These countries contributed more than a third of the studies reviewed. We felt that this does not give a good representation of what might be the situation in the West African region, and therefore the evidence should be interpreted with caution. Having said that, however, the limited coverage of sampled studies means that there is more room for further studies (especially randomised trials) in the region to broaden the evidence base on the impact of school-based health and nutrition interventions to improve the health and nutritional wellbeing of school-age children and adolescents.
13. Another crucial limitation that is worth highlighting was that, due to time constraints the quality or a risk of bias assessment was not carried out. Quality/risks of bias assessment is important in a systematic review to assess the confidence of the review findings. The process allows the reviewer(s) to be able to judge the overall strengths of the evidence reviewed (Slutsky et al., 2008) and draw informed conclusions about the quality and strengths of the evidence. Unfortunately, we could not undertake this exercise (because of time) as part of this review to evaluate the strength of the existing evidence. Importantly, it was not possible to do a meta-analysis to determine the overall pull effect size of the evidence, as originally anticipated, because of the heterogeneous nature of the included literature. For the few included studies that were considered homogenous, only one to two of them included the relevant statistical details needed to perform a meta-analysis.
14. Lastly, given the non-availability of studies in most countries in the region that evaluated the impact of school health and nutrition on the health and nutritional status of children and adolescents, our results cannot be generalised to the whole of the West African context. For these reasons, our results need to be interpreted with some caution.

## 1.5 Structure of the report

15. The remainder of the report is structured as follows:
  - Section 2 provides a brief overview of the socio-economic context and the state of food security and nutrition in the region.
  - Section 3 discusses the state of health and nutrition of school-aged children in the region
  - Section 4 reviews school-based interventions to address health and nutrition; school health and nutrition policies, and maps the regional stakeholders and their positions on school health and nutrition.
  - Section 5 presents the results and discussion of review of studies on the effectiveness of school-based health and nutrition interventions.
  - Section 6 discusses the challenges and gaps in implementing school-based health and nutrition interventions

## Review of school-based health and nutrition interventions in West Africa region

- Section 7 presents conclusions and lessons learned.

## 2 Regional context

### 2.1 Socio-economic context

16. West Africa is one of Africa's sub regions considered to have the fastest growing population in the world, with the current population estimated at 400 million (African Development Bank, 2020; World Bank Group, 2020). By 2035, Africa's population is projected to rise to about 1.8 billion from the current figure of 1.2 billion, and West Africa alone will constitute about 15 percent of that total population (World Bank Group, 2020).
17. In terms of the region's economic picture, a recent review has established that West Africa will experience economic challenges in the next two years (World Bank, 2020). Reasons for this include, but are not limited to, the impact of the global COVID-19 pandemic, which has affected the global financial market; low financial flows; reduced tourism earnings; and declining commodity prices (African Development Bank, 2020; World Bank, 2020). Data from the African Development Bank have revealed that until the COVID-19 pandemic that broke out late 2019, macroeconomic indicators of the West African region were showing positive signs with overall GDP estimated to grow by 4.0 percent by end of 2020 (African Development Bank 2020). For several countries in the region, GDP growth rate was also projected to increase on average from 2.9 percent in 2019 to 3.5 percent at the end of 2020. However, the latest World Bank and African Development Bank reports project a downward GDP growth from late 2020, and this will remain until end of 2022. The projection from the African Development Bank is that the overall economic output of West Africa contracted by 2 percentage points in 2020 - about 6 percentage points below the earlier projected growth rate. Any progression in this region will be dependent on the implementation of robust and potentially effective reforms and economic recovery strategies (World Bank, 2020).
18. Poverty, inequality and unemployment rates in the region also remain high, with several countries recording unemployment rates above the global average, for example, 24.4 percent (Mali), 23.3 percent (Cape Verde), 19.6 percent (Nigeria) and 13.7 percent Ghana (African Development Bank, 2020). Data from the African Development Bank also show that the majority of the West African population (43 percent) live on \$1.9 a day (below the World Bank poverty line). In terms of human development picture of the region, the United Nations Development Programme (UNDP) has hinted that this remains a challenge.
19. The UNDP Human Development Report 2020 has shown that 15 countries in the region fall into the low human development category. Insecurity in the region also remains high in some settings, due to political and ethnic conflicts. As a result, several countries in the region are currently classified by the World Food programme as needing humanitarian assistance. The World Food Programme classifies some countries in terms of humanitarian fragility under the **context of**-"Crisis or humanitarian countries". This includes: Burkina Faso, Cameroon, Chad, Guinea, Guinea Bissau, Liberia, Niger, and Sierra Leone.

### 2.2 Food security and nutrition in the region

20. Hunger in Sub-Saharan Africa, overall, has been on the increase between 2014 and 2019, driven by a number of factors including the effect of El Nino, economic shocks, and crises created through conflict and natural disasters (FAO et al., 2020)<sup>2</sup>. Reports from the FAO indicate that there were 239 million people who are undernourished in Sub-Saharan Africa in 2018, and of these 56.1 million live in the Western Africa region. The prevalence of under-nutrition in the region overall was 14.7 percent, although this is lower than the Sub-Saharan African average (FAO, 2020). Table 3 below

---

<sup>2</sup> FAO, IFAD, UNICEF, WFP and WHO. 2020. *The State of Food Security and Nutrition in the World 2020*. FAO. Rome.



summarised the prevalence of under-nutrition and food security in the region, between 2004 and 2019.

**Table 3: Prevalence of under-nourishment and food security by country, West Africa**

	Prevalence of undernourishment (POU) in the total population		Prevalence of severe food insecurity in the total population	
	2004-2006	2017-2019	2014-2016	2017-2019
Benin	12.2	7.4	n.a.	n.a.
Burkina Faso	23.0	19.2	10.1	13.9
Cabo Verde	11.1	18.5	n.a.	9.6
<b>Cameroon</b>	16.1	6.3	n.a.	n.a.
<b>Central African Republic</b>	n.a.*	n.a.	n.a.	n.a.
<b>Chad</b>	37.9	39.6	n.a.	n.a.
<b>Cote d'Ivoire</b>	20.3	19.9		
<b>Gambia</b>	21.9	11.9	23.6	24.6
<b>Ghana</b>	11.4	6.5	7.6	8.4
<b>Guinea</b>	n.a.	n.a.	44.3	49.7
<b>Guinea-Bissau</b>	n.a.	n.a.	n.a.	n.a.
<b>Liberia</b>	35.9	37.5	63.1	60.4
<b>Mali</b>	13.5	5.1	n.a.	n.a.
<b>Mauritania</b>	9.6	11.9	14.2	31.6
<b>Niger</b>	n.a.	n.a.		
<b>Nigeria</b>	7.4	12.6	6.5	9.1
<b>Sao Tome &amp; Principe</b>	9.2	12	n.a.	n.a.
<b>Senegal</b>	17.4	9.4	14.5	16.7
<b>Sierra Leone</b>	46.7	26.0	30.4	31.8
<b>Togo</b>	27.8	20.7		

Source: FAO et al., 2020. Note n.a. means that data was not available at the time.

21. Although data is lacking in some countries (as seen in Table 3, indicated as n.a), the data that is available suggest that the food insecurity situation in the region, overall, has worsened. Prevalence of food security in Liberia, Guinea and Sierra Leone are above the West Africa regional average. Ghana, Nigeria and Senegal appeared to have the lowest food insecurity prevalence in the region, although the proportion of the population who are food insecure in these countries have slightly been rising recently (2017 and 2019) (Table 3). Overall, in the Western Africa region in 2018, there were 67.2 million people who experienced severe food insecurity, and a further 182.8 million people who were experiencing moderate food insecurity.
22. More recent data reported in the Global Report on Food Crises (FSIN and Global Network Against Food Crises, 2021) indicate a deepening of food insecurity in several countries in the West Africa

and Sahel region. According to the report, 24.8 million people in 17 countries in the region were classified as in crisis or worse (IPC/CH Phase 3 and above) in 2020, and the number is projected to increase to 29.1 million. Nigeria accounted for 9.2 million people (or 37 percent) of those in IPC/CH Phase 3 and above, followed by Burkina Faso with 3.3 million people in crisis or worse. Regional conflict is reported as the main driver of the food crisis in the region. Conflict deprives people of their livelihoods, drives internal and cross-border displacement of people, disrupts markets, trade and crop production, and often constrains access to humanitarian assistance. Economic shocks experienced by several countries in the region prior to COVID-19, and weather extremes are two other main drivers of food crises in the region.

23. Recent analysis has hinted that the COVID-19 pandemic has or will further aggravate the regional food security situation, with those who are already vulnerable likely to be the hardest hit, as incomes decline and poverty increases (African Development Bank, 2020). Over the last 10 years, one in every two primary school children worldwide were receiving, at least, a meal every day at school. This decade of progress has been affected by the COVID-19 pandemic, as the economies of most low middle-income countries are unable to support/sustain the continuous operation of school feeding programmes, and would need to rely heavily on emergency school feeding interventions such as those supported by the WFP.
24. What is reassuring however is that the incidence of COVID-19 infections appears to remain relatively low in the 15 countries of ECOWAS, although most countries in the region do not collect and report/publish data on daily infections, as a result of the swift responses of governments to contain the spread of the COVID-19 pandemic. However, restriction measures, increased budget deficits, the contraction of world trade, and reductions in remittance are likely factors that could contribute to the expected decline in GDP growth, which will subsequently impact on the predicted rise in food insecurity situation in the ECOWAS region. The majority of households recently surveyed reported concerns about running out of food, and those with unstable or precarious sources of income reported concerns about accessing food as food prices increased. In order to address the lack of food, the majority of households resorted to skipping meals, or eating less than usual (ECOWAS, 2020).
25. Undoubtedly the rising food insecurity situation in the region will only contribute to worsen the already high burden of under-fives undernutrition (poor, underweight, wasting and stunting indicators). The data presented in Table 4 indicate that the prevalence of overweight is relatively low and, in most countries, the proportion of children under 5 who are overweight is declining in most countries (where data is available). Stunting on the other hand has only declined slightly in a few countries, but overall prevalence is increasing in most countries ((where data is available).

**Table 4: Prevalence of under-weight, stunting and overweight under-5 years, by country, West Africa**

	Prevalence of wasting: children under 5 years	Prevalence of stunting: children under 5 years		Prevalence of overweight children under 5 years	
	2019	2012	2019	2012	2019
Benin	5.0	n.a.	32.2	n.a.	1.9
Burkina Faso	8.4	32.8	24.9	0.6	1.0
Cabo Verde	n.a.	n.a.	n.a.	n.a.	n.a.
Cameroon	4.3	32.6	28.9	6.5	11.0

Review of school-based health and nutrition interventions in West Africa region

Central African Republic	6.6	39.7	40.8	2.0	n.a.
Chad	13.3	38.7	39.8	2.8	2.8
Cote d'Ivoire	6.1	29.9	21.6	3.2	1.5
Gambia	6.0	21.1	13.6	1.1	2.5
Ghana	6.8	22.8	17.5	2.6	1.4
Guinea	9.2	31.1	30.3	3.8	5.6
Guinea-Bissau	6.0	32.0	27.6	2.8	2.3
Liberia	4.3	39.0	30.1	2.7	2.7
Mali	9.0	27.8	26.9	1.0	2.0
Mauritania	11.5	23.0	22.8	1.2	1.5
Niger	14.1	39.9	48.5	0.8	1.0
Nigeria	6.8	35.8	36.8	3.0	2.1
Sao Tome & Principe	4.0	30.8	17.2	11.1	2.4
Senegal	8.1	15.5	18.8	0.7	2.6
Sierra Leone	5.4	44.4	29.5	9.6	4.5
Togo	5.0	26.2	23.8	1.7	1.5

Source: UNICEF Global Nutrition Report (2020)

26. On the other hand, overweight and obesity, among the adult population, as well anaemia prevalence among women of reproductive age group (15-49 years) is rising in most countries (Table 5). The main determinants for the rising rate of obesity, highlighted in most studies conducted in the region, include increasing intake of caloric diet, declining physical activities and a shift from eating traditional diets to modern high energy dense nutrient poor diets and sugar sweetened beverages among school age children and adolescents (Rousham et al., 2019).

**Table 5: Prevalence of obesity in adults and anaemia in women of reproductive age, by country, West Africa**

	Prevalence of obesity in the adult population (18 years and older)		Prevalence of anaemia in women of reproductive age: (15-49 years)	
	2012	2016	2012	2016
Benin	8.2	9.6	51.5	46.9
Burkina Faso	4.5	5.6	50.5	49.6
Cabo Verde	10.3	11.8	31.2	33.3
Cameroon	9.8	11.4	41.7	41.4
Central African Republic	6.4	7.5	46.2	46.0
Chad	5.1	6.1	48.1	47.7
Cote d'Ivoire	8.7	10.3	51.8	52.9
Gambia	8.7	10.3	57.2	57.5
Ghana	9.4	10.9	48.6	46.4

Guinea	6.4	7.7	50.9	50.6
Guinea-Bissau	7.9	9.5	44.0	43.8
Liberia	8.6	9.9	37.3	34.7
Mali	7.2	8.6	54.8	51.3
Mauritania	11.0	12.7	37.2	37.2
Niger	4.5	5.5	49.2	49.5
Nigeria	7.4	8.9	49.9	49.8
Sao Tome & Principe	10.7	12.4	45.4	46.1
Senegal	7.6	8.8	53.5	49.9
Sierra Leone	7.4	8.7	47.9	48.0
Togo	7.1	8.4	50.0	48.9

Source: FAO et al., 2020

### 2.3 HIV in the region

27. The prevalence of HIV in the West and Central Africa region (as defined by UNAIDS) in 2019 was relatively lower at 0.5 [0.3-0.8] than the prevalence in the East and Southern Africa region - 2.3 [1.3-3.3] (UNAIDS database, 2021).
28. Within the West Africa region, Cameroon, the Central African Republic, Sierra Leone and Guinea Bissau have the highest prevalence rates of HIV among young people aged 15-24 years. Table 6 shows the prevalence rates for young females and males in the region. Without exception, the prevalence rates for HIV among young women were higher than the prevalence rates for young men. This illustrates the vulnerability of young women 15-24 years, to HIV infection.

**Table 6 Prevalence of HIV among young people 15-24 years, by country, in West Africa**  
Prevalence of HIV among young people 15-24 years (2019)

	Females	Males
<b>Benin</b>	0.4 [0.2 - 0.8]	0.2 [0.1 - 0.5]
<b>Burkina Faso</b>	0.4 [0.2 - 0.5]	0.3 [0.2 - 0.4]
<b>Cabo Verde</b>	0.2 [<0.1 - 0.3]	0.1 [<0.1 - 0.2]
<b>Cameroon</b>	1.4 [0.7 - 2.1]	0.6 [0.3 - 0.8]
<b>Central African Republic</b>	1.4 [0.6 - 2.3]	0.9 [0.4 - 1.5]
<b>Chad</b>	0.6 [0.3 - 0.9]	0.4 [0.2 - 0.5]
<b>Cote d'Ivoire</b>	1.1 [0.6 - 1.5]	0.6 [0.4 - 0.7]
<b>Gambia</b>	0.6 [0.4 - 0.8]	0.2 [0.1 - 0.4]
<b>Ghana</b>	1.0 [0.4 - 1.8]	0.3 [0.2 - 0.6]
<b>Guinea</b>	0.8 [0.4 - 1.2]	0.4 [0.2 - 0.5]
<b>Guinea-Bissau</b>	1.2 [0.6 - 1.9]	0.7 [0.3 - 1.1]
<b>Liberia</b>	1.0 [0.5 - 1.4]	0.6 [0.3 - 0.8]
<b>Mali</b>	0.8 [0.6 - 1.1]	0.4 [0.3 - 0.6]
<b>Mauritania</b>	<0.1 [<0.1 - <0.1]	<0.1 [<0.1 - <0.1]

Review of school-based health and nutrition interventions in West Africa region

<b>Niger</b>	<0.1 [<0.1 - <0.1]	<0.1 [<0.1 - <0.1]
<b>Nigeria</b>	0.6 [0.3 - 1.0]	0.3 [0.1 - 0.6]
<b>Sao Tome &amp; Principe</b>	n.a.	n.a.
<b>Senegal</b>	<0.1 [<0.1 - 0.1]	<0.1 [<0.1 - 0.1]
<b>Sierra Leone</b>	1.2 [0.6 - 1.7]	0.6 [0.3 - 0.9]
<b>Togo</b>	1.0 [0.5 - 1.5]	0.5 [0.3 - 0.7]

Source: UNAIDS Database, 2021

### 3 Health and nutrition status of school-aged children

#### 3.1 State of health and nutrition of school-aged children

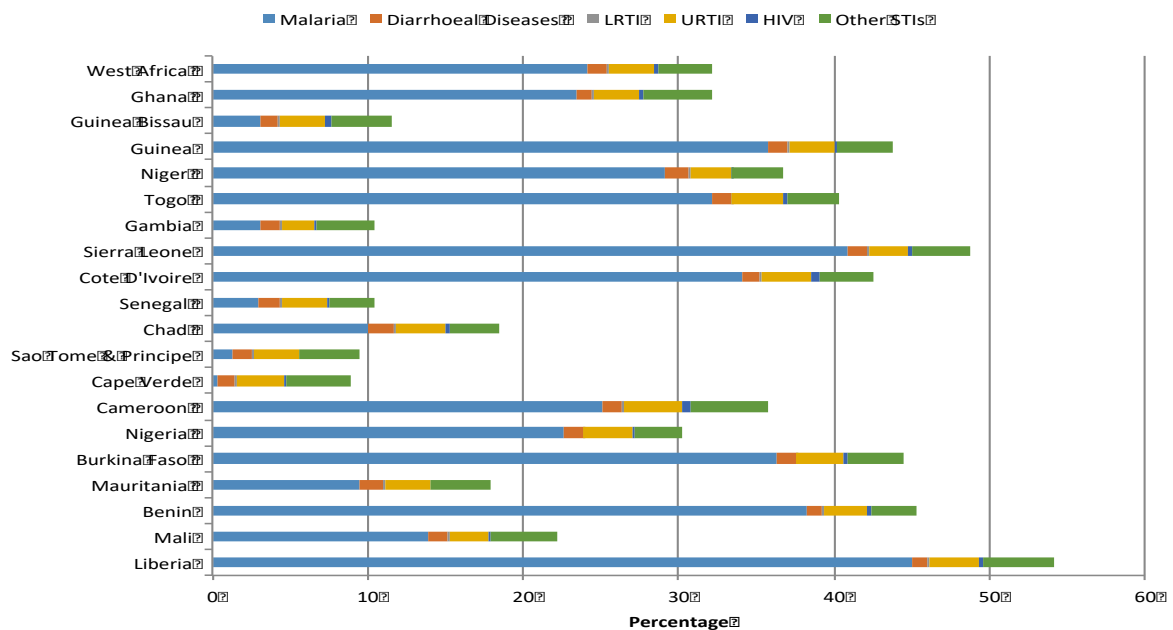
29. The health of school-aged children in West Africa remains a concern, and further poses as a development challenge. Although studies have shown that mortality rate among this age group remains low compared to their counterparts in lower age groups (infants and pre-schoolers) (Burbano, 2009) they experience common parasitic infections more frequently, partly due to poor water sanitation and hygiene practices, high burden of malnutrition (including micronutrients deficiencies) and other health conditions which could have both short and long-term consequences on their development, health and education. Drake *et al.* (2017) reported that when children suffer from these health conditions, their average IQ lost can range from 3.7 points per child with untreated worm infections to 6.0 IQ points for children with iron deficiencies (anaemia).
30. Children with low IQ will have poor cognitive function in later life, leading to reduced school attainment (educational gap). This will lead to a direct loss of human capital and productivity for the national economy due to lower economic output and slow economic growth. It is estimated that the economic cost of malnutrition could range from 2 to 3 percent in national GDP (World Bank, 2016).
31. Malnutrition, if not treated, can have long-term devastating consequences on the health, and mental and physical development of children (WHO, 2008). For instance, stunting or low height for age is associated with long-term health risk, such as impaired intellectual achievement and school performance, and subsequently, reduced work capacity and obstetric complications (Frongillo, 1999, Best et al., 2010). When children are stunting, they are also less likely to perform well in school which could have direct impact on their future income and earning capacity. Currently, in Africa stunting in children under five-years is a major problem, with serious consequences for the physical and cognitive development of children and education attainment when they reach school going age.
32. Although a recent World Bank and UNICEF report (2021) has revealed that stunting in children under five, overall, has declined globally in the last two decades, from 33.1 percent (2000) to 22.0 percent (2020), the number of stunted children under-five years in Sub-Saharan Africa (SSA) is on the increase, despite the decreasing prevalence trend. The FAO 2020 report indicates that the number of stunted children in SSA is estimated as 53.9 million, the majority of these children live in the Western Africa (18.5 million) and East and Central Africa regions (9.4 million). In terms of prevalence, the data show that prevalence of stunting and wasting has declined overall between 2012 and 2019 in some West African countries (ref: Table 4). The reduction in the prevalence of stunting has been achieved through improved nutrition, governance, food fortification, vaccinations, Vitamin A provision, improvement in water and sanitation, and health services for mothers, infants and young children, as well as a reduction in ethnic and religious conflicts in the region (FAO, 2020)..
33. The devastating impact of malnutrition in children extends beyond stunting and wasting. Studies have shown that children who have low body mass index [BMI]-for-age (a measure of thinness in school-aged children and adolescents) can also experience “delayed maturation, deficiencies in muscular strength and work capacity, and reduced bone density” in the long-term (WHO, 1995). Those children that are overweight or obese may also face increased risk of non-communicable diseases (NCDs) such as diabetes, high blood pressure, hypertension and metabolic syndrome in later life (WHO, 2003). Micronutrients such as Vitamin A, Zinc, Iron and Iodine are also crucial during the early childhood and adolescent years for optimum growth and development, both physically and mentally. Therefore, a deficiency of these important nutrients could put children and adolescents at increased risk of growth and intellectual deficiency.

34. Beyond malnutrition, other preventable diseases such as sexually transmitted infections including HIV remain high among adolescents. Available data show that, of the proportion of people infected with HIV globally, the majority are young people aged between 15 and 24 years. About 80 percent of these people live in SSA where one in six adolescents' deaths are attributed to HIV (UNAIDS 2014).
35. Despite this level of awareness, we still do not have sufficient data in this age group (school-age children and adolescents) to help us quantify the extent and magnitude of health problems in West Africa that can subsequently inform policy and interventions development to address them. Small-scale household surveys describing prevalence of some of the diseases' burden, for example, malnutrition, anaemia, malaria etc., exist, but these are not nationally representative because of the relatively small sample size, and in most of the surveys, school-aged children are often left out (Best et al., 2020).
36. To obtain information on the state of health and nutrition of school-aged children and adolescents in West Africa we accessed and analysed data from the Global Burden of Diseases (GBD) database, managed by United Nations Children Fund (UNICEF), and the UNICEF Specific data on child mortality. The GBD database provides a tool to quantify health loss from hundreds of diseases, injuries, and risk factors, so that health systems can be improved and disparities can be eliminated. The GBD data incorporates both the prevalence of a given disease or risk factor and the relative harm it causes.
37. We extracted and re-analysed the data using descriptive statistics to estimate the burden (prevalence), of nutritional problems, and morbidity and mortality. The analysis focused on key specific communicable diseases (HIV, respiratory infections, and WASH related illnesses such as malaria, diarrhoea and parasitic infections), nutrition problems (specific micronutrient deficiencies: vitamin A, iodine and dietary-iron deficiencies) that are known to impact negatively on schoolchildren and adolescents.
38. In the next sections we have presented summaries from the GBD database that describe the current state of health and nutrition of schoolchildren in the West African region.

#### **Burden of selected communicable diseases (including HIV)**

39. The UNICEF GBD data revealed that malaria remains the biggest disease burden among school-aged children in the West Africa region. The prevalence of malaria in eight countries (Liberia, Sierra Leone, Benin Republic, Guinea, Niger, Cote' D'Ivoire, Burkina Faso and Togo) is high and above the regional average of 24 percent. The lowest prevalence of malaria was reported in Mauritania (9 percent) and Chad (10 percent). Besides malaria, sexually transmitted diseases (STIs), excluding HIV, and upper respiratory infections were also high, although the prevalence of these diseases was significantly lower compared to malaria burden. HIV prevalence and lower respiratory infections were the least prevalent (Figure 2).

**Figure 2 Prevalence of infectious diseases among school-aged children 5-19 years (GBD, 2019)**

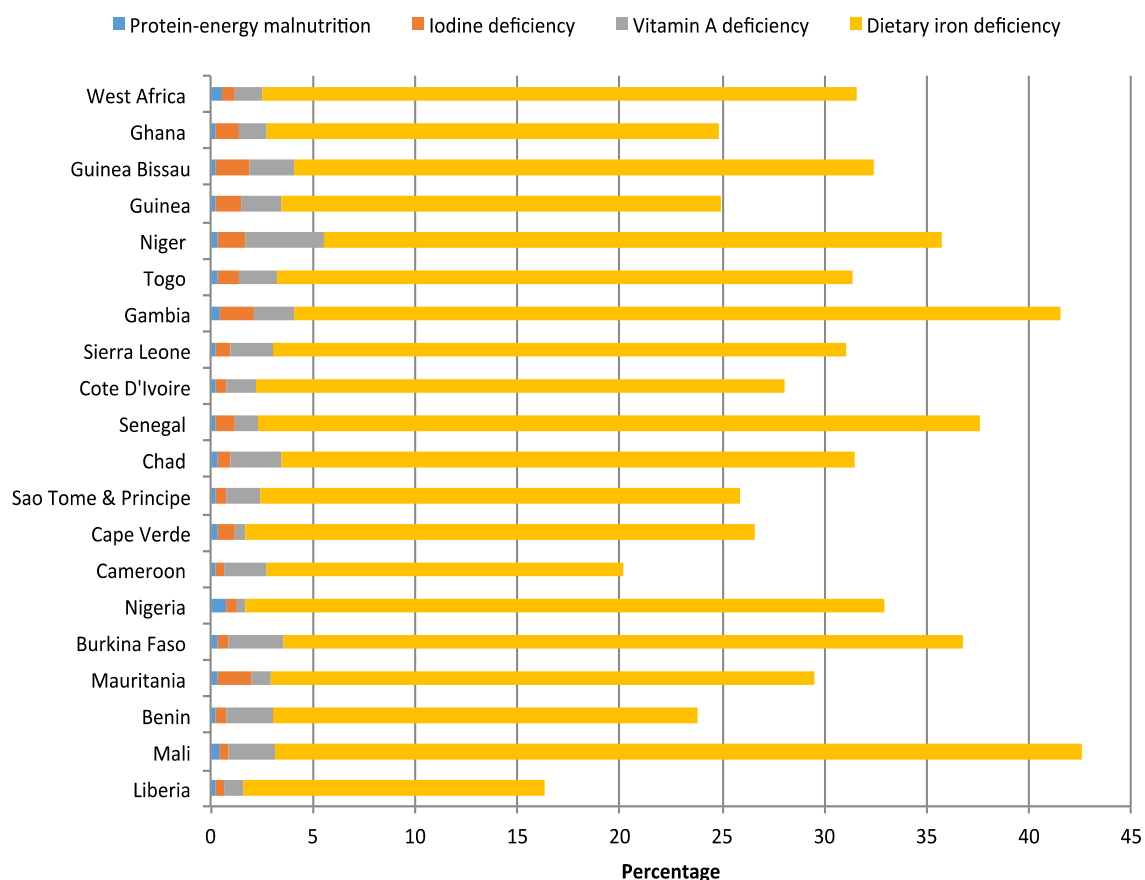


**Nutritional challenges**

40. The GBD data revealed that micronutrient deficiencies were the biggest nutritional problem among school-aged children and adolescents in the region. Dietary-iron, followed by vitamin A deficiencies are the two micronutrient deficiencies that pose the biggest threat to school-aged children and adolescents in the region. The prevalence of dietary-iron deficiency, across many countries, was significantly higher than the regional average (Figure 3), and two countries (Mali and the Gambia) had unacceptable prevalence of iron deficiencies exceeding 40 percent. The high prevalence of these important micronutrients should remain a concern to practitioners and policy decision makers in the region because, as earlier discussed, iron and vitamin play key roles in various functions that are important to a healthy growth and development of adolescents and school-aged children. The main clinical manifestation of vitamin A deficiency is *xerophthalmia*, a severe eye disorder and a primary cause of childhood blindness. In addition to this effect, some studies have also linked Vitamin A deficiency to poor iron status in children, as well as cognitive deficiencies that negatively affect educational performance and attainment (Best et al., 2010).

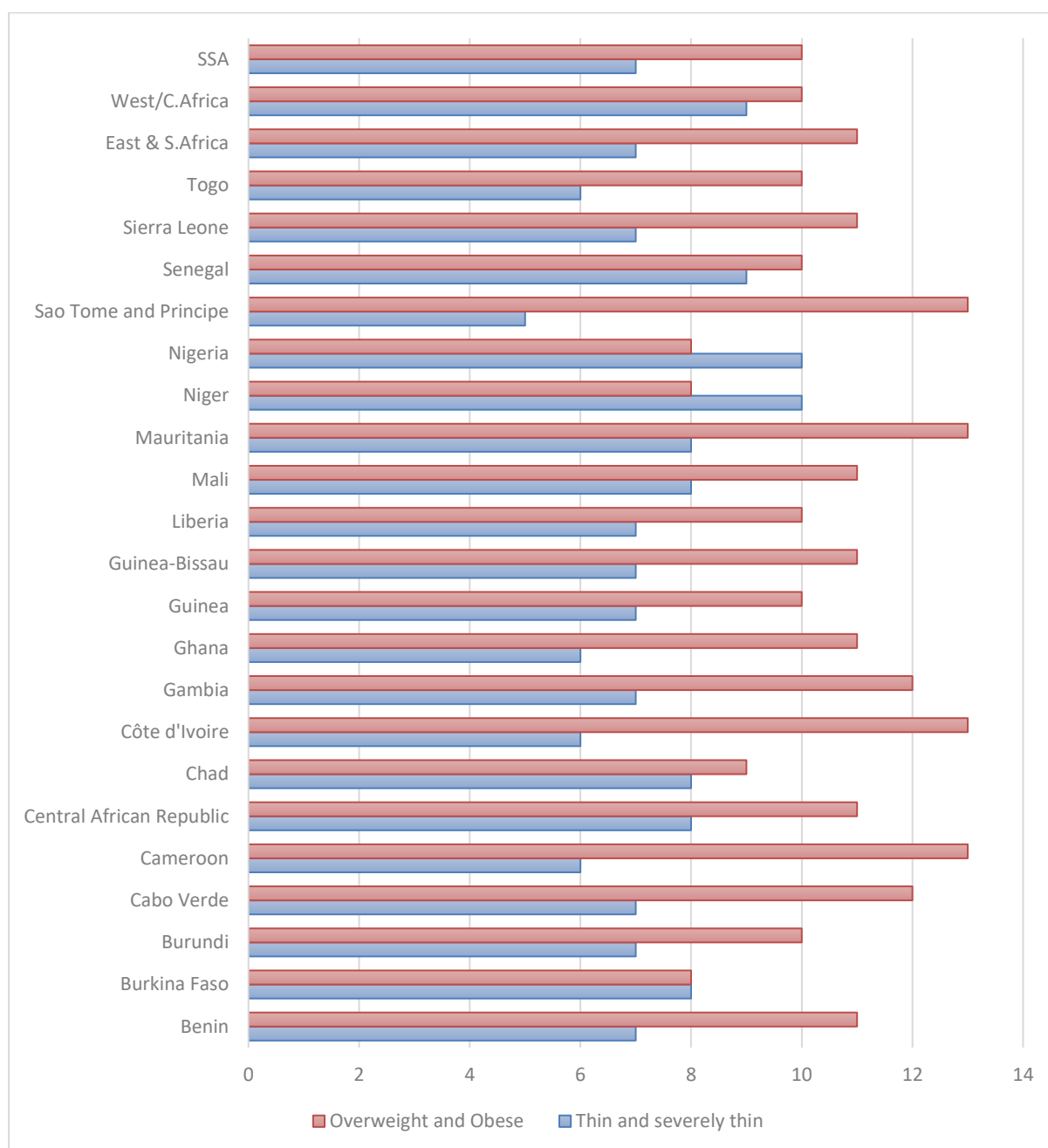


**Figure 3 Prevalence of nutritional problems among school-aged children 5-19 years (GBD, 2019)**



41. There was limited data in the GBD database to estimate the current burden of stunting (children who are too short for their age) and underweight/thinness (children/adolescents who are too thin for their age) in school age children and adolescents age 5-19 years. Data only exist for children below the age of five years. However existing data published by UNICEF 2019 (State of children 2019 report), revealed that an estimated 33.1% of children below the age of 5 years are stunted or are too short for their ages in West and Central Africa. This data is similar to those reported for East and Southern Africa for children below age 5 years (33.6 percent).
42. Data was available from the UNICEF database to determine the situation of children and adolescents' thinness, incidence of being overweight and obese. Our analysis of the data shows that the number of girls and boys between the ages of 5 and 19 years who are affected by these conditions have increased, significantly in every continent, rising by between 10- and 12-fold globally. This was consistent with the existing literature. The data show that the prevalence of thinness (both thin and severely thin) and overweight and obesity is 9 percent and 10 percent respectively in West and Central Africa. The proportion of children who are thin or severely thin is slightly lower when compared with the Sub-Saharan Africa average (7 percent), but similar for overweight and obesity (Figure 4).

**Figure 4 Proportion of thinness (thin/severe thin) and overweight/obesity in children age 5-19 years (UNICEF, 2019)**

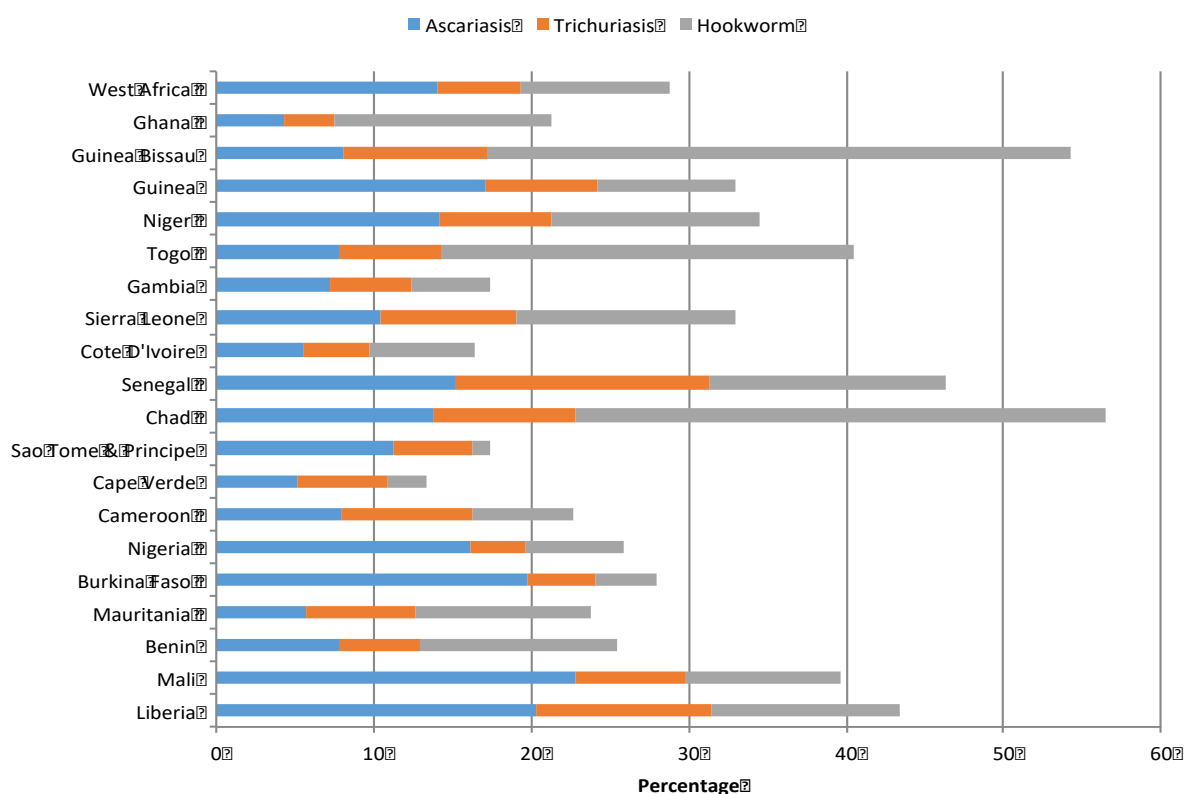


43. Prevalence of overweight and obesity is slightly higher (above the West and Central Africa sub-regional, and the Sub-Saharan regional averages) in 13 countries. A similar trend was observed for the proportion of children who are thin or severe thin, demonstrating a double burden of malnutrition among school age children and adolescent in this region. With regards to children below age five years, the UNICEF projection is that if not prioritised and tackled seriously, the number of children overweight in this age group, globally, will rise from currently 40 million children to 43 million by 2025. Reasons for the high rate of overweight and obesity incidence in the West and Central regions of Africa can be attributed to increasing intake of caloric diet, declining physical activities and a shift from eating traditional diets to modern high energy dense nutrient poor diets and sugar sweeten beverages among school age children and adolescents.

**Burden of parasitic infections**

44. We examined the data on intestinal parasite infections in children and adolescents for this analysis because the literature suggests that children who suffer from parasite infections are less likely to attend school due to increased absenteeism. Parasite infections also negatively impact on children's learning ability and educational outcomes (WHO, 2002 and 2018). According to Francois et al. (2014) about 287 million, 194 million and 135 million school-aged children suffer from *Ascaris*, *Trichuriasis* and hookworm, respectively worldwide. Also, the systematic review we completed as part of this work suggests that most of the deworming interventions implemented within the school environment are targeted at addressing these intestinal parasites infections, and the aim of such interventions is to reduce burden by delivering treatment regimes. Thus, the objective of our analyses was to understand and appreciate the magnitude and extent of the problem of these intestinal parasites infection in children in the West African region. Figure 5 below presents the results of our analysis done using the GBD data. As shown, all three parasites remain highly prevalent in the majority of the West African states. Hookworm infection was the most prevalent, and higher than the regional average in many countries. The prevalence of hookworm was particularly problematic in three countries (Guinea Bissau, Chad and Togo).

**Figure 5 Prevalence of intestinal worms among school-aged children 5-19yrs (GBD, 2019)**

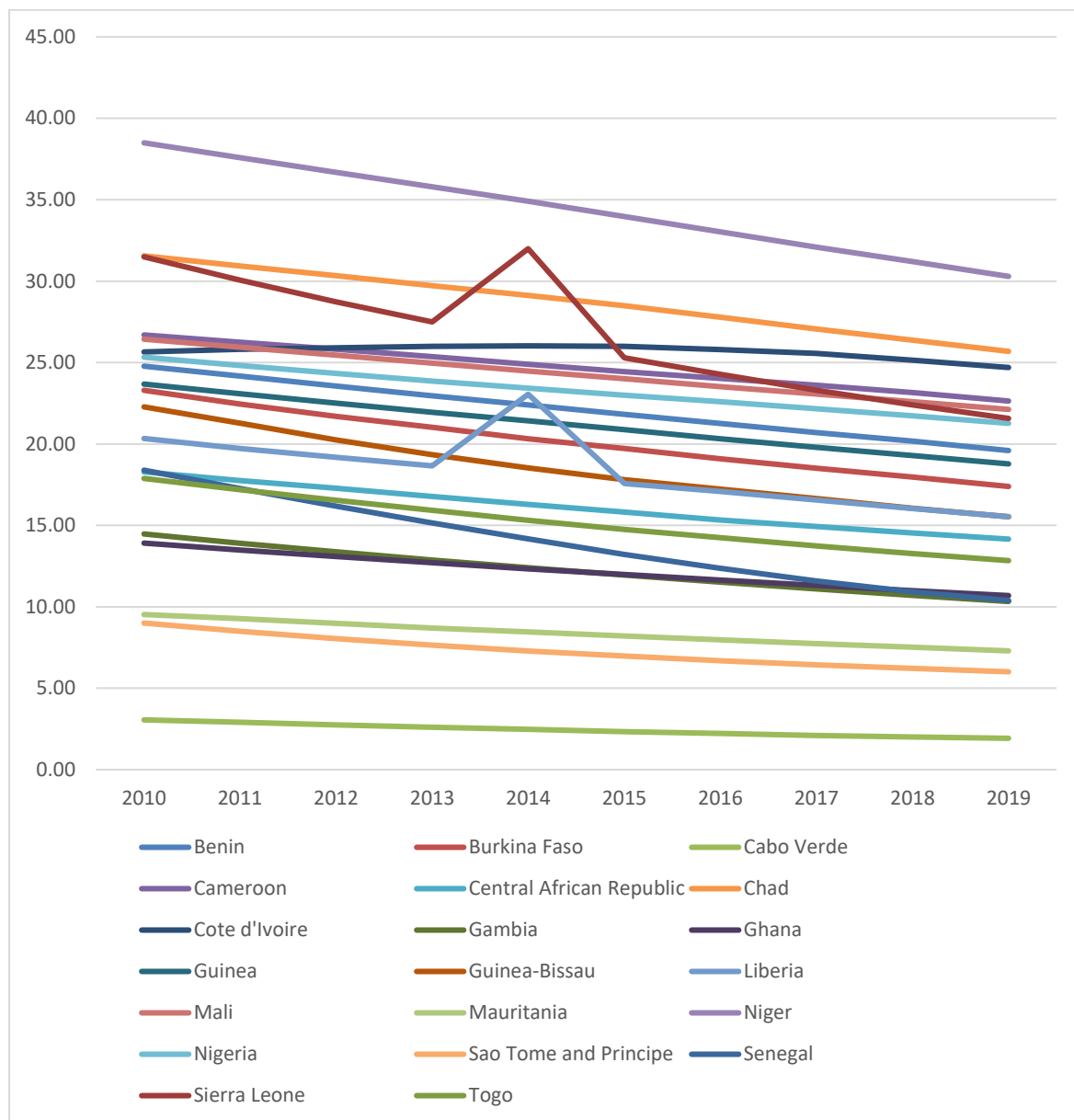


**Mortality burden**

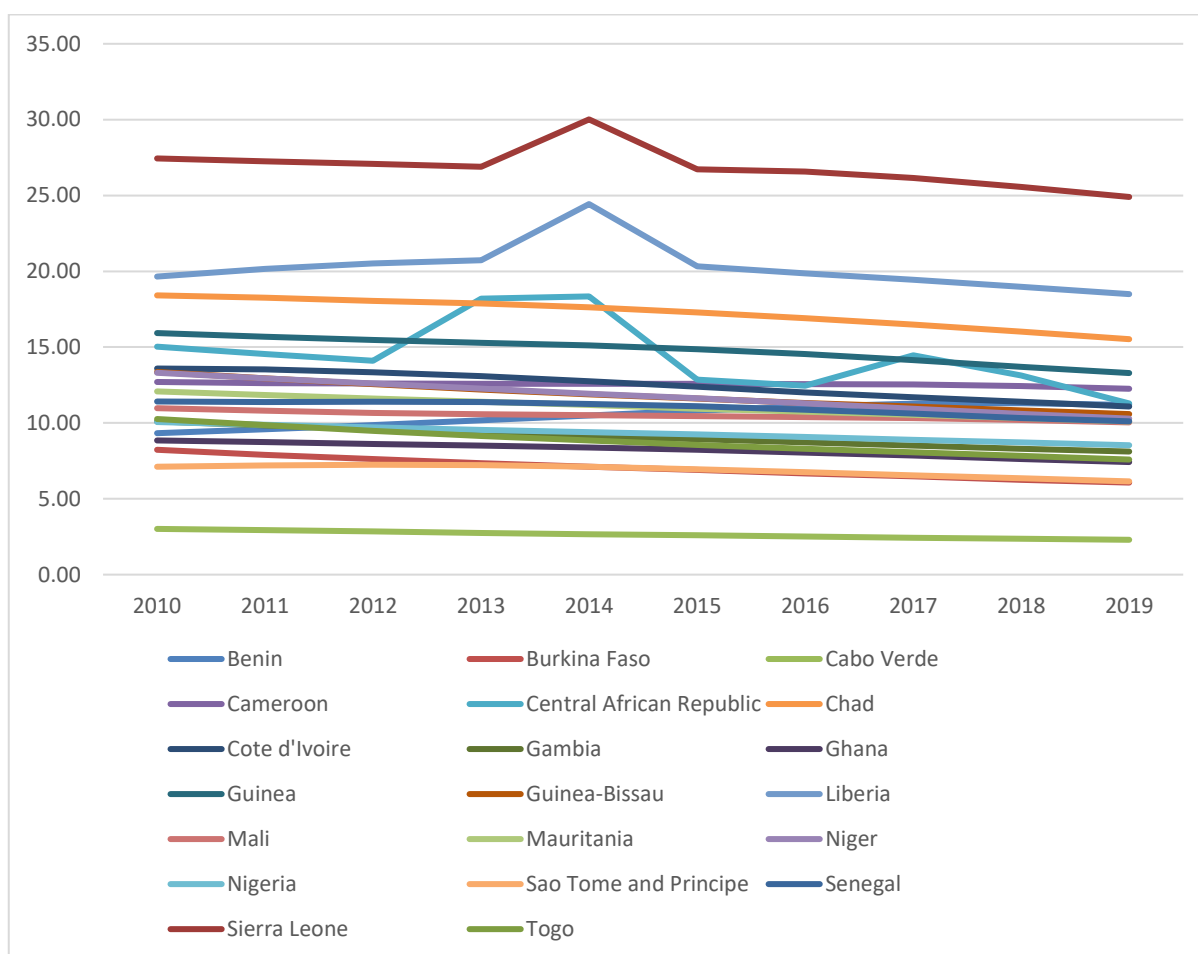
45. Although mortality among school age children and adolescents' (5-19 years) remains high in several West and Central African countries, analysis of the 2019 UNICEF child mortality data indicate a declining mortality trend (all disease causes) trend in the last 10 years (2010 to 2019). The decrease in the mortality trend seen over this period was evident in all 19 countries (Figures 6 and 7). The current mortality rates (2019) in the age group 5-14 years (due to all causes), range from a low rate of 1.9 per 1,000 children in Cabo Verde to a high rate of 30.3 per 1,000 children in Niger. Chad, Cote d'Ivoire, Mali, Sierra Leone and Nigeria all have school-aged children and adolescents' mortality rates above 20 per 1000 children.

46. Among the children age 15 to 19 years, the UNICEF mortality data show a similar trend; mortality is reportedly lower (2.3 per 1,000 children) in Cabo Verde, and higher in Sierra Leone (24.9 per 1,000 children). As shown in both figures (6 and 7) a sharp increase in mortality rate for both children age 5-14 years and 15-19 years was observed in Liberia and Sierra Leone (5-14 years) and Central African Republic, Liberia and Sierra Leone (15-19 years).

**Figure 6 Trend in all-cause mortality of children aged 5-14 years (UNICEF, 2019)**



**Figure 7 Trend in all-cause mortality (Child per 1000) among school-aged children 15-19 years (UNICEF, 2019).**



### Water, Sanitation and Hygiene (WASH) provision in schools

47. Table 6 presents data from West Africa showing countries' coverage of school-based WASH services (the percentage indicates NO WASH rather than available WASH services). The data were accessed from the WHO/UNICEF Joint Monitoring Programme (JMP) for water supply, sanitation and hygiene and analysed to establish the situation of WASH services provision in West African schools. The Joint Monitoring Programme captures data on individual countries globally, so that an assessment can be made on progress on drinking water, sanitation and hygiene at the country, regional and global levels. As shown, school WASH services remain low in most countries in the region.
48. Only seven countries (Benin, Cabo Verde, Mali, Sao Tome and Principe, Senegal, the Gambia and Ghana) appear to have made progress in terms of water and sanitation provisions in schools (more than 70 percent coverage). Guinea has also shown an improvement but only for sanitation services. There was no data to assess hygiene service status in 10 countries. Details on WASH services at the pre-primary, primary and secondary schools' levels are presented in Annex D).

**Table 6**  
**National data showing no WASH services in West Africa Schools**

2019 Data	Water (%)	Sanitation (%)	Hygiene (%)
Benin	21	28	n.a.
Burkina Faso	41	20	n.a
Cabo Verde	<1	1	n.a
Cameroon	36	49	n.a
Central African Republic	77	59	n.a
Chad	63	n.a	n.a
Côte d'Ivoire	50	50	73
Gambia	23	<1	n.a
Ghana	29	23	38
Guinea	67	18	68
Guinea-Bissau	35	47	75
Liberia	48	33	15
Mali	6	19	19
Mauritania	79	60	n.a
Niger	81	65	n.a
Nigeria	37	40	62
Sao Tome and Principe	15	16	10
Senegal	23	19	72
Togo	57	n.a	n.a

Source: WHO/UNICEF JMP data (2020)

## 4 School-based health and nutrition interventions

### 4.1 Extent of school-based health and nutrition interventions in West Africa

49. There are a broad range of interventions or services being implemented within the school environment in Africa to address the health issues discussed above. The aim of these interventions is to improve the overall health and nutritional wellbeing, and academic progression of school-aged children and adolescents. Examples of these interventions include school-based nutrition interventions, infection control through de-worming treatment; water, sanitation and hygiene interventions; adolescent sexual and reproductive health interventions, and interventions to prevent the spread of HIV and other sexually transmitted diseases.

#### **School-based nutrition interventions**

50. School-based nutrition interventions can take the form of in-school feeding, where children are provided with cooked meals or snacks in school, and take-home rations, where parents are given food rations to motivate them to send their children to school (Sniltveit et al., 2015; Drake et al., 2016); agricultural diversification; micronutrients supplementation; on-site fortification; and nutrition education (Best et al., 2020). These interventions are designed to achieve multiple objectives or purposes. The most commonly cited of these are: to achieve food and nutrition security for improved health and nutritional status for school-aged children; improve learning and educational outcomes; increase protection and gender equality (Tull, 2018), increase domestic food production and consumption, and incomes of poor rural households (Ghana School Feeding Policy, 2010). When implemented alongside de-worming treatment and nutrition education programmes, school-feeding programmes have the potential to achieve maximum impact. For instance, a study in Nigeria found that participatory hygiene education to deworming programmes greatly improved the haemoglobin level of children in areas where there is a high prevalence of hookworm infections (Sufiyan, 2017). The study concluded that such a complex intervention could be a short-term preventive measure for anaemia in children.
51. Almost all countries in the West Africa region have school feeding programmes in place, with varying degrees of coverage. In most countries, school feeding programmes target primary schools grades 1-6, though countries such as Ghana and Liberia programmes' covers pre-primary/kindergarten classes as well. WFP plays a direct role in the implementation of school feeding programmes in most countries in the region. Typically, meals take the form of a hot, nutritious meal at lunchtime. In selected countries such as Burkina Faso, Cameroon and Chad, WFP provides take home rations (THR) for girls in higher primary grades to encourage completion of their schooling. Complementary interventions include deworming (for example, Central African Republic, the Gambia and Liberia); education in nutrition and hygiene (for example, Mauritania and Cote d'Ivoire); and school gardens, for example, Niger and Togo. In most countries, food is mainly sourced from abroad, complemented by domestic sources from smallholder producers. Typically, the Ministry of Education is the lead ministry in the implementation of school feeding programmes, with varying degrees of involvement of other ministries, for example, health, and agriculture, the latter in the case of home-grown school feeding programmes.
52. Following the COVID-19 pandemic that has impacted on the economies of low-middle income countries globally, resulting in a worsening food security situation, many government school feeding programmes have come to a sudden halt. As a result, many countries in the West Africa region have promoted Emergency SF during the COVID-19 pandemic, but results are not yet available to showcase this.

### **School-based HIV interventions**

53. School-based HIV interventions remains the most efficient ways of reaching the majority of the youth to educate them on how to prevent HIV and other sexually transmitted infections (UNICE, 2000). Examples of school-based interventions include preventive education delivered in schools, services delivered in youth centres such as counselling and testing for HIV, condoms distribution, and conditional and unconditional cash transfers delivered to young people. Similar to the nutrition interventions above, these interventions are designed with multiple aims and purposes, but the overall purpose of HIV interventions is to reduce vulnerability of adolescents to STIs including HIV (Mavedzenge et al 2016; Sani et al 2016). Studies have shown that if properly delivered and targeted at the right group, school-based HIV interventions can have beneficial impact. For instance, a few global reviews have concluded that HIV interventions contribute to an increase in adolescents' sexual knowledge and attitudes towards adopting safer sexual practices to prevent HIV (e.g. Paul-Ebhimhen et al, 2008; Amaugo et al 2014). One review of seven intervention studies in Nigeria reported positive changes in adolescents' sexual behavioural patterns including delaying sexual debut, increasing condom use and reducing frequency of sexual activity (Amaugo et al 2014; Mwale and Muula 2017).

### **School based Water, Sanitation and Hygiene (WASH) interventions**

54. WASH interventions include hand-washing initiatives (such as water, wash basins, soap, drying devices); drinking water initiatives; improved sanitation (improved toilets, facilities for menstruation); and hygiene behaviour initiatives (handwashing with soap, hygiene education) (McMichael et al 2019). When delivered within the school environment WASH interventions can be beneficial in increasing hygiene knowledge, and changing children and adolescents attitudes and behaviours towards handwashing with soap among adolescents (Babatope, 2013; Vanwesenbeeck, 2016; McMichael et al 2019). However, their effectiveness in improving the health and education outcomes among adolescents are not well established.

## **4.2 Policy and Legal frameworks supporting school-based health and nutrition interventions**

55. For school-based health and nutrition interventions to work to achieve maximum impact, well-articulated policy and or legal frameworks must be developed and used to support their implementation. As part of this review, we conducted a rapid review and analysis of country-level policies that support school health and nutrition interventions. The analysis sought to uncover whether such policies or legal framework are in place at individual West Africa countries to guide the development and implementation of school health and nutrition interventions.
56. Our search returned 74 relevant policies/strategy documents. Of these, 22 were policies and the remaining 52 were strategies. The policies include national health policies, national nutrition policies, education sector policies, school nutrition (school-feeding) and HIV policies, WASH sector policies. We found only nine countries (Ghana, Nigeria, Mali, Mauritania, Chad, Cote D'Ivoire, Guinea, Togo and Cameroon) with school nutrition (school-feeding) specific policies. Only one country (Benin) had an HIV-specific policy for schools. In the majority of the countries where we found no school-specific policies for school nutrition, HIV and WASH, there were separate strategies developed, based on their national health and nutrition policies, to promote school health and nutrition among school children and adolescents. In countries where there were no such strategies in place, we found that these countries have sections in their national health and nutrition policies or plans focusing on school health and nutrition (Annex D).
57. One finding that was consistent across all the countries' policies is that they seem to provide no guidance on the percentage of total nutrient or caloric needs that school meals should contribute.



Guinea-Bissau and Togo have passed school feeding legislation (in 2019 and 2020, respectively) aimed at guaranteeing the existence of school feeding and funding for school feeding programmes, and guiding the implementation of school feeding programmes.

## 5 Mapping of stakeholders involved in school-based Health and nutrition

58. We conducted a mapping of regional stakeholders in school health and nutrition. The mapping covered United Nations entities in the region, Regional Economic Communities (Economic Community of West African States - ECOWAS and Economic Community of Central African States - ECCAS), research institutions and international non-governmental organizations with a presence in the region, as well as regional farmers' organizations. The results of the mapping are reported in Annex C. A limitation of the mapping is that it relied on the websites and documents of organizations that could be considered stakeholders, and these websites did not always have information on the positions of these organizations on school health and nutrition. There are many national non-governmental organizations and local community-based organizations that are involved in school health and nutrition. Information on these organizations is not readily available in each of the countries in the region, and it would require extensive research/survey to obtain this information.

### United Nations entities

59. The Food and Agriculture Organization of the United Nations (FAO), United Nations Educational, Scientific and Cultural Organisation (UNESCO), United Nations Population Fund (UNFPA), United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) are major United Nations entity stakeholders in the WFP West Africa Region.
60. FAO is a major partner of WFP in the WFP West Africa region<sup>3</sup> in responding to food crises and emergencies in West Africa and the Sahel. FAO has developed its *School Food and Nutrition Framework (2019)* that seeks to guide FAO's support to countries in leveraging the synergies presented by schools as platforms for a holistic approach to raising levels of nutrition, reducing poverty, and enabling inclusive food systems. FAO is one of the contributors to the *Home Grown School Feeding Framework* and is expected to collaborate with WFP and other stakeholders in supporting governments to design and implement Home Grown School Feeding interventions. The mapping did not find information dealing specifically with collaboration between FAO and WFP on school feeding in the WFP West Africa region.
61. The International Fund for Agricultural Development (IFAD) has nutrition as one of its areas of focus. IFAD aims to contribute to nutrition-sensitive agriculture in the production of food by smallholder farmers and women farmers who receive support from IFAD via national governments. IFAD's role in Home Grown School Feeding to date has been limited.
62. UNICEF is another major stakeholder in the region. UNICEF's *2019 State of the World's Children* report focuses on food and nutrition of children. Key messages include: (a) Investing in nutrition for children and young people is a cornerstone investment if the world is to achieve the Sustainable Development Goals by 2030; (b) Improving children's nutrition requires food systems to deliver nutritious, safe, affordable and sustainable diets for all children. The report stresses the importance of middle childhood 5-9 years as an opportunity for children who experienced stunting to catch up. Nutrition habits are also established during this period. The report notes that data on what school-

---

<sup>3</sup> It should be noted that countries in the WFP West Africa region fall within the FAO West Africa sub-regional office and the FAO Central Africa sub-regional office.

aged children eat are limited; (c) Adolescents 10-19 years diets in low and middle-income countries are generally nutritionally poor. UNICEF' *Child Friendly Schools Framework (CFS)* promotes a child rights and holistic approach to education that includes the promotion of the physical and emotional health of children by addressing their key nutritional and health care needs and equipping them with knowledge for the future.

63. The UNICEF and WHO Joint Monitoring Programme also generates data on individual countries globally to allow assessment of progress made on WASH at the country, regional and global levels.
64. In August 2019, the WHO Regional Committee for Africa developed a strategic plan to reduce malnutrition in the Africa Region. The strategy aims to reduce all forms of malnutrition throughout the life course. Its objectives are to strengthen policies and regulatory frameworks, strengthen national capacity and evidence base for nutrition programming. Its guiding principles include a life-course approach, multi-sectoral collaboration, universal health coverage and partnerships. One of the priorities in the strategic plan is to strengthen multi-sectoral collaboration to prevent malnutrition, and advocates for strong collaboration between health and education sectors for educating school-aged children on nutrition.
65. United Nations Economic Commission for Africa (UNECA) has a regional office for West Africa in Niamey (Niger) and supports Member States of the Economic Community of West African States (ECOWAS). It provides Member States and regional economic communities with capacity building and advisory services to assist structural transformation of economies and economic integration of West Africa; and capacity building for planning, monitoring and evaluation. UNECA West Africa collaborates with ECOWAS on impact assessment of COVID-19, including impact on food security. UNECA Head office in Addis Ababa collaborated with FAO and the African Union in preparing the *2019 Africa Regional Overview of Food Security and Nutrition*.

### **African organizations**

66. There are continental (Africa-wide) stakeholders with regional offices/hubs or a presence in countries covered by the WFP West Africa region. These have been included in the stakeholder mapping.
67. The African Union (AU) adopted the revised *Africa Regional Nutrition Strategy 2015-2025* that mirrors nutrition targets adopted by African countries at the World Health Assembly in 2011. The AU works with Member States to improve nutrition and knowledge/evidence – for example, the *Cost of Hunger in Africa* study. The AU strongly supports school feeding. It has the AU School Feeding Initiative where the AU is working with Member States to implement school feeding. The AU commissioned a major study on *Sustainable School Feeding in Africa (2018)* with support of WFP. The *African Day of School Feeding* was instituted in January 2016 through AU Decision of African Union Heads of State and Government in recognition of the value of home grown school feeding.
68. AUDA-NEPAD: African Union Development Agency: School feeding is one of NEPAD/AUDA's flagship projects under the Food and Nutrition Programme. In 2019, AUDA-NEPAD published the *Home Grown School Feeding Handbook* based on lessons learned from Botswana, Ghana, and Nigeria.
69. The ECOWAS has 15 Member States that fall within the WFP West Africa region. ECOWAS is a major regional player in the economic development of the region and regional security. ECOWAS has programmes in food security and child protection, but there is no explicit mention of nutrition in its programmes. The Interstate Committee for Drought Control in the Sahel (CILSS) is a technical arm of ECOWAS and monitors food security in 17 West African countries. It makes no specific reference to school health and nutrition in its activities.
70. The African Development Bank: Banking on Nutrition programme seeks to unlock the nutrition potential in the bank's investment portfolio. The Bank launched its *2018-2025 Multi-sectoral Nutrition Action Plan* in December 2018. The plan targets nutrition-smart investments in agriculture, water

and sanitation, and social protection, and projects a 40 per cent reduction in stunting by 2025. The Action Plan includes the use of school-based food and nutrition interventions covering school feeding, micronutrient supplements, deworming, health promoting behaviours, WASH and creating enabling school environments.

### **African research institutions**

71. Africa Research Universities Alliance Centre of Excellence in Food Security is concerned about triple burden of malnutrition, and high intake of low nutrient higher energy food leading to malnutrition, and impact on vulnerable groups, especially children. It also notes that many on the Continent rely on agriculture for livelihoods. One of its research focus areas is to explore pathways to providing sufficient, safe, and nutritious and consumer driven food for populations of 21<sup>st</sup> century Africa. The objectives of the Centre of Excellence are to produce foods with local and indigenous African plants and animals that are affordable, marketable and convenient, nutrient dense, and implement appropriate food processing technologies for SMMEs to manufacture convenient African foods; policies and programmes to ensure nutrient adequate foods are available, culturally acceptable, accessible and affordable to African populations. The Centre is led by University of Pretoria in South Africa, in collaboration with University of Ghana, Legon, Accra and the University of Nairobi, Kenya.

### **Civil society organizations and non-governmental organizations**

72. It is outside the scope of the study to map all civil society and non-governmental organizations in each country in the WFP West Africa region. The mapping focused on global and regional organizations with a presence in the countries that form part of the WFP West Africa region.
73. Save the Children International operates in the following West African countries: Burkina Faso, Niger, Nigeria, Senegal and Sierra Leone. Save the Children subscribes to the FRESH framework for School Health and Nutrition (SHN). The SHN programme is linked with the Save the Children education sector programmes and is seen as a continuation of the Early Childhood Development programme. SHN interventions are adapted to country contexts and needs and include providing school children with access to improved WASH facilities; access to deworming and micronutrient supplementation, vision and hearing screening, oral health promotion, malaria prevention and treatment, obesity reduction; skills-based health education for developing lifelong health behaviours, including HIV and AIDS prevention; advocacy for national policies that support schools and communities. Save the Children produced a Health Education Manual (2013) to assist SHN Programme Managers to design and implement health education in schools, for children aged 8-10 years. The lessons cover WASH, Infectious Diseases including Neglected Tropical Diseases, Taking care of our bodies, Preventing diseases and injury, Nutrition, Sexual Reproductive Health including HIV and AIDS prevention.
74. World Vision International operates in the following Central and West African countries: Central African Republic, Chad, Mali, Mauritania, Niger and Senegal. World Vision released its *Health Sector and Nutrition Approach 2020-2030* that sets the high level goal: Ensure healthy lives and promote well-being for all children. While children under-five years are the main target of World Vision, the new approach recognises the need to improve the health and nutrition of adolescent girls to reduce under-five mortality and maternal mortality. The approach makes provision for improving dietary diversity and addressing micronutrient and iron deficiency in adolescents aged 12-18 years. Health and nutrition interventions are linked with other interventions, for example, WASH, child protection, mental health, and infectious and neglected tropical diseases.
75. The Global Alliance for Improved Nutrition (GAIN) has offices in eight Sub-Saharan African countries including Nigeria. GAIN's aim is to make diets more affordable and accessible, and supports large-scale food fortification in Ethiopia, Kenya, Mozambique, Nigeria and Tanzania; and better diets for children in Ethiopia, Mozambique and Nigeria; and adolescent nutrition in Mozambique. GAIN

adopts a food systems approach to nutrition, working closely with governments to shift policies in favour of nutritious diets.

76. CARE International works in 100 countries globally, including 14 countries in the West Africa region (Benin, Burkina Faso, Cote' D'Ivoire, Guinea, Senegal, Niger, Mali, Chad, Togo, Ghana, Cameroon, Nigeria, Liberia, and Sierra Leone). The organization's work includes food and nutrition, education and health. Its health, food and nutrition programmes focus on children under-five years. CARE also works with adolescent girls on improving health - reducing anaemia and promoting sexual reproductive health especially for married adolescent girls. CARE supports smallholder agriculture, especially women farmers, to meet their food needs and develop sustainable livelihoods. There is no reference to school health and nutrition in the organization's description of its programmes.
77. Plan international: has offices across West Africa, and as part of their education programme, Plan International promote free and equal access to quality education for all children – from early learning to secondary education. Plan work with children, their families, communities, wider society and governments, and advocate at both local and international levels, so that all children are able to get an education.

#### Implications for WFP

78. The stakeholder mapping revealed a diverse range of organizations involved in school health and nutrition in the region. WFP has partnerships with several other United Nations entities at country level through the United Nations Strategic Development Cooperation Framework (UNSDCF), and collaboration with the United Nations Rome-Based Agencies (RBAs), namely, FAO and IFAD, through the Home Grown School Feeding Programme. There are undoubtedly opportunities for strengthening WFP's partnerships at country level with other United Nations organizations in pursuing an integrated approach to the health and nutrition of school-aged children. There are also opportunities for joint United Nations advocacy on school health and nutrition.
79. The African Union and its implementing agency, as well as regional intergovernmental bodies have policies and programmes on school health and nutrition. WFP's support at country level to strengthen the policy environment for school health and nutrition should be aligned to the policies of the African Union and the relevant regional intergovernmental bodies.
80. The stakeholder mapping identified several international non-governmental organizations (NGOs) that have a footprint in a number of countries in the region, and so present opportunities for partnerships in strengthening national capacities for implementation of school feeding for example. It was beyond the scope of the review to map the national NGOs and community-based organizations (CBOs) in each of the countries in the region. Partnering with national NGOs, particularly those with good capacities, should not be confined to implementation, but should include advocacy on issues pertaining to the health and nutrition of school-aged children.
81. The need for evidence generated through sound research is a theme that runs through the remaining sections of this review report. There are research institutions in the region that are potential partners for WFP to expand the evidence base for more effective policies and programmes in school health and nutrition.

## 6 Effectiveness of school-based health and nutrition interventions: a systematic evidence synthesis

82. This section presents the results of a review of literature addressing the effectiveness of selected school-based health and nutrition interventions in improving education, health, nutrition and other outcomes for school-aged children. It considers school feeding programmes and/or supplementation, nutrition education and deworming as well as HIV and WASH interventions. The details of the methodology and search strategy used can be found in **Annex A: Methodology**.

### 6.1 School-based nutrition interventions

#### Results

#### Overview of results

83. The PRISMA flow chart (**Annex A, figure 9a**) summarises the study selection process and the final studies that were considered relevant, and included in the school-based nutrition review. Because the HIV and WASH review was conducted after the school-based nutrition review was completed, a separate PRISMA is used to describe the HIV and WASH studies selection process (**see Annex A, figure 9b**). This overview of the results presented in section 4.3.5 is based on the phase 1 study selection process. Phase 2 overview is described in section 5.2.1. Overall, 272 citations on school-based nutrition interventions and deworming were retrieved: 264 from the academic databases, 28 from other sources (grey literature sources, n=22, and citation chasing/reference list checking n=6). After removal of all duplicates (n=45 citations), 227 titles were screened against a predefined inclusion and exclusion screening criteria. The title screening processed led to the removal of 171 citations not meeting the title inclusion criteria stage, leaving 156. A further screening of the potentially qualified abstracts and full-texts eliminated additional 116 eligible citations, leaving final 40 studies included in the review.
84. Of the 40 included studies, n=33 were academic peer-reviewed studies, and n=7 were grey non-peer review reports. Study designs used include randomised controlled trials, non-randomised trials, pre-and-post evaluation and comparative cross-sectional designs.

#### Study types/designs

85. The majority were quantitative studies (n=36), and only a few (n=4) were qualitative studies involving interviews and focus groups. We found two literature review papers but excluded them as the individual studies included in these reviews were already captured in our searches. We also checked in the reference list to make sure that we did not miss any important references from these reviews. Across the quantitative studies, n=6 (17 percent) were randomised controlled trials, of which only one study was a cluster randomised controlled trial. A total of 29 studies (80.6 percent) were comparative cross-sectional studies which either used controlled comparative or before-and-after designs.

#### Study setting and population

86. As earlier stated, the review covered all countries in the West Africa sub-region. This means that our search strategy included all 19 West Africa countries. However, following the search, we did not find any studies that met the review inclusion criteria from 14 of the 19 countries. The included studies were largely from five West African countries: two Anglophone countries (Ghana, n=29 and Nigeria, n=7) and three Francophone countries (Burkina Faso, n=2, Togo, n=1 and Cote d'Ivoire, n=1). In terms of the population studied, all the included studies targeted school-aged children and adolescents aged between 5 years and 20 years (NB: only one study included children below 5 years but we only extracted data from those children who were 5 years and older). The total sample size

from all the included studies was 48,743, and ranged from a small sample (n=60) to a large sample (n=26,811).

### Interventions

87. Our review focused on two school-based nutrition (school feeding including micronutrients supplementation, nutrition education) and deworming interventions. The choice of these interventions was informed by the needs of the commissioners of the review, but also because of time constraints. Across all the included studies, 32 studies focused on school feeding, while the remaining 8 studies focused on nutrition education (n=3) and deworming (n=5).

### Outcomes

88. The review evaluated the potential impact of the school-based nutrition interventions on two broad outcomes: i) education attainment, ii) nutrition and health status, of school-age children and adolescents. The most studied outcomes were the nutritional and health outcomes (n=21). The specific nutritional outcomes reported in the included studies were stunting, thinness, overweight/obesity, energy and nutrient intake, and dietary diversity. Health outcomes reported were; haemoglobin levels or prevalence of iron-deficiency anaemia, malaria, diarrhoea, respiratory tract infections and hookworms (Table 7 and Table 8).

**Table 7: Distribution of studies by nutritional and health outcomes reported**

Reference	Country	Nutritional and health outcomes (combined)			
		Nutritional anthropometry	Energy/nutrients intake	Nutrition knowledge & dietary diversity	All reported health outcomes
Kwabla et al., 2018	Ghana	☐			
Gelli et al., 2019	Ghana	☐			
Abdul Karim, 2018	Nigeria				☐
Agbozo et al., 2018	Ghana	☐			☐
Gelli et al., 2016	Ghana				
Abizari et al., 2014	Ghana	☐	☐		
Gaala and Saaka, 2011	Ghana	☐			☐
Aaron et al., 2011	Nigeria	☐	☐		
Danquah et al., 2012	Ghana	☐			
Davidson and Eze, 2012	Nigeria	☐			
Azangba, 2017	Ghana				☐
Amy Lynch, 2019	Ghana	☐			
Owusu et al., 2016	Ghana	☐			
Lezama et al., 2001,	Togo			☐	

Review of school-based health and nutrition interventions in West Africa region

Antwi et al., 2020,	Ghana			□	
Humphries, 2017	Ghana				□
Sufiyan, 2011	Nigeria				□
Humphries et al., 2013	Ghana				□
Ofosu et al., 2014,	Ghana				□
Hürlimann et al., 2014	Cote D'Ivoire		□		□
Ayi et al., 2020	Ghana			□	□

**Table 8: Distribution of studies by educational outcomes reported**

Reference	Country	Educational outcomes			
		Enrolment	Attendance	Retention	Academic performance and completion
Abdul Karim, 2018	Nigeria				
Galla and Saaka, 2011,	Ghana				
Kazianga et al., 2009	B/Faso				□
Abdul Kudus, 2011	Ghana	□			
Taylor et al., 2016	Nigeria				□
Abayomi & Bukari, 2014	Ghana	□	□		
Eric and Gyapong, 2014	Ghana				
Ampofo and Pac, 2020	Ghana				
Nikiema et al., 2017	B/Faso				
Diderutua, 2018	Ghana			□	
Aliu Mohammed, 2014	Ghana				
Bukari, 2015	Ghana				
Salifu et al. 2018,	Ghana				
Akanbi & Alayande, 2011	Nigeria				
Mahama, 2018	Ghana				
Amponsah, 2018	Ghana				

Aurino et al. 2018	Ghana				
Anero, 2020	Nigeria				

### 6.1.1 Findings

89. We have presented a narrative review of the evidence reported by authors of the included studies. As previously described, the general aim of school feeding programmes (Jomaa et al., 2011; Snilstveit et al., 2015) is to improve the general health and wellbeing of children, provide a safety net for vulnerable and food insecure households, and to improve children’s ability to learn. These interventions are generally categorised into “traditional school-feeding programme” and take-home ration (THR) programmes. The traditional school feeding programme generally provide meals in school to children, whereas in the take-home ration intervention children are provided with dry food ration in school, which they can take home to their family (Lawson, 2012).
90. The effect of take-home rations on parents were beyond the scope of the review. We found only two studies, one in Burkina Faso (Kazianga et al, 2009) and another from Ghana (Galaa and Saaka, 2011) that evaluated the effect of THR on our outcome of interest.

### A: Impact of school feeding interventions

#### Educational outcomes

91. The two included studies from Burkina Faso reported a small effect of school feeding programmes on education outcomes of children and adolescents. In their study, Kazianga et al (2009) compared two school feeding programmes: one that provided daily meals to schoolchildren (boys and girls), and one that provided take home rations to girls with the aim to enhance girls’ enrolment, attendance and academic performance. The authors reported that both interventions had impacted on school enrolment, for girls, by 5 to 6 percentage points, but they found no significant improvement on academic performance. The authors concluded that school meals had no significant impact on academic performance for girls. These findings were similar to what Nikiema et al., (2017) reported in a later study in the same context. The authors evaluated a school feeding programme that provided meals to schoolchildren to promote enrolment and school attendance, with the trigger groups being girls. The findings reported suggest that the intervention resulted in increased school enrolment rate for girls by 3.2 per cent, and overall attendance for boys were higher (8.4 percent) compared to girls (6 percent).
92. In Nigeria, Abdul-Karim (2018), appraised the Nigerian government school feeding programme in the Borno State, and reported that the intervention has led to an improvement of school enrolment in public primary schools. The findings further suggest that the school feeding led to an improvement in school attendance and students’ retention in schools. In a related study conducted in Nigeria, Taylor et al. (2016) reported that following the roll out of the government school feeding programme in Osun State, a high rate of 78.4 percent school enrolment rate, retention of 44 percent, attendance, and academic performance rates of 58.6 percent and 55.2 percent respectively. However, as this study does not report baseline data to compare changes in enrolment, attendance and academic performance before the intervention, it is difficult to draw conclusions. In a more recent study, Anero (2020) compared the performance/completion rate of students who attended the government school feeding programmes schools with schools where the intervention was not running, and reported that the proportion of students completing school had improved since the introduction of the school feeding policy. Subgroup analysis shows that there was no significant difference between completion rates in urban and rural schools implementing the school feeding programmes.



93. In Ghana, the school feeding programme was introduced in public primary schools, initially in pilot poor rural deprived schools in 2005 by the government. The intervention was later scaled up to benefit other children in low socio-economic urban settings. The school feeding programme had three main objectives: 1) increase enrolment by improving access and 2) address undernutrition, and 3) increase domestic supply of locally produced crops. Since then, several follow up evaluation studies have assessed the potential impact of the policy. In this review, we found 12 Ghanaian studies that have examined the impact of the Ghana school feeding programme on educational outcomes.
94. Findings from eight of these studies demonstrated a positive impact of the programme on education attainment (Galaa and Saaka, 2011; Bukari, 2015; Amponsah, 2018; Mahama, 2018; Salifu et al., 2018; Abdul-Kudus, 2011; Aliu, 2014; Abayomi and Bukari, 2014). According to Abayomi and Bukari (2014) enrolment in primary schools implementing the school feeding programme increased by 24 percent compared to only 7 percent for non-school feeding programmes schools. Subgroup analysis shows a marginal increase in enrolment for boys (51 percent) compared to girls (49 percent). The academic performance for students benefiting from school feeding programmes has improved, especially for the older aged children in upper classes, the study reveals. The authors further reported that the pass rate recorded in English language had increased by 35 percent, maths by 21 percent and integrated science by 18 percent, in the school feedings schools compared to a downward trend observed in these scores - English (26 percent), maths (34 percent), and integrated science (30 percent) for the non-school feeding schools. Results from this study also highlighted that dropout rates in the non-school-feeding programme schools increased by nearly half (49 percent), compared to a 48 percent reduction in dropout in schools implementing the school feeding programme.
95. In three other studies conducted in the same Ghanaian context, enrolment rate had improved in feeding programme schools by 4 percent (Abdul-Kudus, 2011), attendance by 6 percent (Salifu et al, 2018), and by 10 percent academic performance (Aliu, 2014). Only four of the 12 Ghanaian studies reported a moderate improvement in school enrolment rates (Diderutua, 2018), school attendance (Eric and Gyapong, 2014), and academic performance and completion of school (Aurino et al., 2018 and Ampofo and Pac, 2020).

### **Health and nutritional outcomes**

96. We found 12 studies that assessed the effect of school feeding programmes on the nutrition and health status of schoolchildren and adolescents in West Africa (Tables 2 and 3 in Annex D). These studies were mainly from Anglophone West Africa, of which the majority were conducted in Ghana (n=9) and Nigeria (n=3). Overall, the included studies reported large to small effect of school feeding on nutritional improvement of children. For instance in Nigeria, Aaron et al (2011) earlier evaluation of a pilot school feeding scheme in the Narawa State found no effect of school feeding on anthropometric changes in children, and no impact on the prevalence of morbidities (malaria, diarrhoea and respiratory infections) between the children who benefited compared to the children who did not benefit from the intervention. On the contrary, the findings reported by Abdul Karim recent appraisal of the Nigerian Government school feeding programme (2018) attributed the significant improvement in nutritional status seen among public primary school children who benefited from the programme in the Borno State to the school meals programme.
97. In another study, Davidson and Eze (2012) also found similar positive results, attributable to the school-feeding programme. The authors revealed that the prevalence of malnutrition in children (25 percent stunting, 17 percent wasting and 14 percent underweight) was lower among children in school feeding programme schools compared to their counterparts who were enrolled in the non-school feeding programme schools (30.7 percent stunting, 20 percent underweight and 30 percent wasting).

98. Findings from the majority of the Ghanaian studies reviewed are consistent with what the Nigerian studies reported. In a recent study in Ghana, Gelli et al (2019) found no effect of school feeding on linear growth (stunting) and thinness (BMI-for-age) of children aged 5-15 years. However, following a subgroup analysis the authors reported that school feeding had a slight effect on younger age groups (5-8 years), and children from low-income households. The results, in terms of linear growth was (mean HAZ at baseline (-0.89) to -0.90 (endline) for school feeding group), and HAZ 0.96 (baseline) to 1.13 (end line) for non-school feeding group ( $p=0.043$ ). Three other Ghanaian studies (Kwabla et al., 2018; Abizari et al., (2016; and Agbozo et al (2018), all found no effect of school feeding and improvement of linear growth and thinness of school children (see tabulated results in table 2 in appendix). Only two studies reported an average increase in height and weight (Azangba and Nyarko, 2017), and a significant mean increase in height-for-age (linear growth) and BMI-for-age (thinness) between the school feeding group and the no school-feeding group (Gelli et al., 2013) after children were enrolled in school feeding intervention for 6 months. Results extracted from grey literature reports also highlighted some positive impact of school feeding and improvement of schoolchildren nutritional status (Galaa, Saaka (2011) and Danquah et al., 2012). In terms of school feeding (micronutrients supplementation) effect on nutrient intake, the findings from both Nigeria and Ghana were again consistent. All of the 4 studies (3 Ghanaian, and 1 Nigerian studies) revealed that school feeding had a positive effect on energy and nutrient intake among the children enrolled in school feeding programmes. For instance, Abizari et al., (2014) reported that the proportion of school feeding participants with energy intake below the recommended requirement was lower than that of non-school feeding participants. The findings related to school feeding (nutrient intake) and iron/haemoglobin status and prevalence of anaemia were also consistent across the studies. Overall, the findings reported demonstrate no significant difference in iron-deficiency anaemia between the schools feeding versus no school feeding groups.

### **B: Impact of school nutrition education**

99. Beyond school feeding, our review also examined the evidence around nutrition education on the health and wellbeing, and the ability of children to learn. Nutrition education has been widely recognised as an important strategy that could contribute to improving the overall health and nutritional status of the general individuals, especially among the young population. When delivered in schools, the aim is usually to provide nutrition knowledge to schoolchildren to influence positive attitude and behaviour change towards healthier food and lifestyle choices, which could potentially lead to enhanced nutritional and health statuses (Contento et al., 1995).
100. In our review we wanted to understand whether the delivery of school nutrition education has had any effect on nutritional knowledge and subsequent improvement of the health and nutritional status of schoolchildren. Unfortunately, we found limited studies that have evaluated the potential impact of school nutrition education in the West African sub-region. The few school nutrition education studies ( $n=3$ ) reviewed, reported evidence to suggest that school nutrition education could contribute to improve the health and nutritional literacy of schoolchildren. Of the three studies we included in this review, one was conducted in Togo (Lezama et al., 2001), and the other two were conducted in Ghana (Antwi et al., 2020; Ayi et al., 2010). Lezama and colleagues (2001) evaluated a nutrition education programme delivered in Togo to prevent iodine deficiency disorders in schoolchildren. The findings published from this study revealed that intervention has enhanced the nutrition knowledge and positive attitude and practice towards iodine deficiencies among schoolchildren.
101. These findings were similar to what Antwi et al., (2020) recently reported from a similar evaluation in Ghana. In their study, Antwi et al. compared two groups; an intervention group involving children who received nutrition education and a control group who did not receive the intervention. They reported that nutrition knowledge score was significantly higher in the intervention group ( $8.8\pm 2.0$ ) compared with the control group ( $5.9\pm 2.1$ ),  $p=0.001$ . The authors further reported that although

dietary diversity scores were high, the scores were not different between the intervention (4.8±2.0) vs. and the control groups (5.1±1.4),  $P = 0.184$ . They concluded that delivering nutrition education interventions in primary schools could have potential impact on the knowledge and attitude of schoolchildren towards healthy food choices and consumption behaviours.

### **C: Impact of school deworming interventions**

102. We found five studies that evaluated school-based deworming intervention in three West African countries. Three of the studies were from Ghana (Humphries, 2017, Ofosu et al., 2014 & Humphries et al, 2013), one study from Cote d' Ivoire (Hürlimann et al., 2014) and one from Nigeria (Sufiyan et al, 2011). The specific intervention (deworming treatment) described in all the studies was the provision of a single 400mg dose of albendazole to schoolchildren to treat hookworm infections.
103. In Ghana, Humphries and colleagues (2017) reported that hookworm infection rate reduced from 59 percent to 35 percent following the deworming, with a mean faecal egg reduction rate of 61 percent (51.8-71.1). In a similar study published earlier, the authors reported a 43 percent cure rate after a deworming intervention implemented at Kintampo in the North Western part of Ghana. Similar positive results were also reported in the study published by Ofosu et al. (2014). This study used a pre-post evaluation design to evaluate the impact of a school-based deworming programme in the Kwahu West Municipality of Southern Ghana. The findings reported suggest that the intervention has led to a significant reduction of absenteeism among schoolchildren by more than half, from 23.7 percent before the deworming to 15 percent after the deworming.
104. In Nigeria, in addition to the single dose albendazole deworming treatment the children received, Sufiyan et al (2011) reported that the children received a participatory lecture series delivered over 12 weeks. The results after the intervention demonstrated a significantly increased mean haemoglobin levels of the children who participated, from an initial 10.4 g/dl to a post-intervention of 12.4 g/dl (paired t-test = 13.96;  $P = 0.001$ ). The authors concluded that adding participatory hygiene education to deworming programmes would greatly improve the haemoglobin level of children in areas where there is a high prevalence of hookworm infections, especially as a short-term preventive measure for anaemia in children.
105. In Cote, d'Ivoire, the deworming programme had no effect on haemoglobin levels and anaemia, but children with moderate- to heavy-intensity *Schistosoma* infection at baseline gained weight more pronouncedly than non-infected children. Children with soil-transmitted helminth or *Schistosoma* infection at baseline performed significantly better in the sustained attention test than their non-infected counterparts at 5-month follow-up. Lower scores in strength tests were significantly associated with children with harbouring nutritional deficiencies.

### **6.1.2 Discussion of the evidence on school-based nutrition**

106. This review examined the literature on how school feeding, nutrition education and deworming interventions' impact on the health and nutritional status of school-age children in the West Africa region. Overall, our results demonstrate that school-based nutrition (feeding, school nutrition education, delivered alongside deworming treatment) interventions have had a positive effect on schoolchildren who were beneficiaries compared to those children who were non-beneficiaries, although for some specific outcomes, the average effects are relatively small (especially the nutrition outcomes). In this section, we have tried to situate the findings within the context of the wider literature, and drawing on available qualitative evidence, described why these interventions have worked or failed to achieve maximum impact.
107. **School feeding:** We found evidence that suggests that school feeding has a positive impact on educational, health and nutrition outcomes of beneficiary schoolchildren. For educational outcomes, the findings suggest that school enrolment, attendance and retention have improved following the rollout of school feeding programmes in Ghana, Nigeria and Burkina Faso. However,

a relatively smaller effect was reported in some of the studies in terms of academic performance, school completion and improvement of nutritional status of children. For the health and nutritional outcomes, the findings were mixed. Although a good number of the studies reviewed reported that school feeding resulted in positive improvement of nutritional status of beneficiary children, others found no significant difference in nutritional outcomes between the children who benefited from school feeding compared to those who did not. For the studies that found positive effect, the results show that younger, compared to older children in low-income households were more likely to experience great weight gain and linear growth.

108. **School nutrition education:** The main outcome evaluated for school nutrition intervention was nutrition knowledge of the schoolchildren who benefited from the intervention, although other secondary outcomes such as attitude towards diet diversification were also reported in the studies we reviewed. None of the two nutrition education studies reported on effect on education outcomes. Overall, limited studies exist on this topic but the results are promising. The results suggest that nutrition education intervention has had beneficial effect in improving nutrition knowledge and attitudes of schoolchildren towards healthier dietary choices, and this could subsequently lead to the development of positive dietary behaviours for improved nutrition status.
109. **Deworming intervention:** Similar to the school nutrition intervention, we found limited studies evaluating deworming intervention. However, the evidence from the few studies reviewed demonstrate an overall positive effect on school attendance and academic performance. Studies generally reported that high prevalence of absenteeism due to hookworm infections dropped, with corresponding improvement in exams scores following deworming to treat hookworm infections. In terms of health and nutritional outcomes, the evidence suggests that deworming did not improve haemoglobin levels, hence no effect on anaemia prevalence. Only one study found an improvement in weight gain in the children who received the interventions compared to those who were not dewormed.
110. The above findings appear to be consistent with the wider literature, as similar global studies and reviews reported mixed findings of positive to no effect of school-based nutrition interventions on health, nutrition and education outcomes. For instance, in an earlier review that meta-analysed global studies to examine the effect of school-based intervention on access to education, it was reported that school-based nutrition interventions have a positive effect on education outcomes, with effect size ranging from 0.11 SMD (95 percent CI: [0.07, 0.15]) for enrolment, to 0.13 SMD, 95 percent CI [0.08, 0.18] for attendance (Sniltveit et al, 2015). A similar systematic (narrative) review completed earlier (Lawson, 2012), reported similar findings.
111. Sniltveit et al. (2015) reported marginal effect for deworming interventions on education outcomes, with effect size ranging from -0.04, 95 percent CI [-0.11, 0.02] to 0.05 SMD, 95 percent CI [-0.02, 0.13] for academic performance (math test scores). The effect of deworming on school attendance was relatively small in some contexts. In a large cluster randomised trial in Peru, (Francois et al. (2014) assessed the effect of post-deworming hygiene education intervention on absenteeism in school-aged children, and found no significant difference in absenteeism between the intervention and controls schools. However, during the 4 months post-deworming follow up the results show that students who had moderate to heavy *Ascaris*, and light hookworm infections had missed 2.4 percent (95 percent CI: 0.1% to 4.7 percent) and 4.6 percent (95 percent CI: 1.9 percent, 7.4 percent) school days compared to their uninfected colleagues.
112. The findings from both Sniltveit (2015) and Lawson (2012) reviews were consistent on school nutrition interventions effect on nutritional outcomes, and appear to agree with our findings. The results they reported revealed a moderate to no effect of school feeding intervention on the nutritional status of children who benefited.

### **Why the school nutrition programmes worked/might work**

113. Lawson (2012) and Adelman et al. (2008), both argue that for school feeding programmes to make an impact in improving education outcomes such as increase school enrolment and attendance, the net benefit of participating in the programme must exceed the direct and indirect costs of attending school. The programme should also act as an incentive for parents to motivate them to send their children to school. For such intervention to work to correct nutritional deficiencies, the authors argues that the food provided must be rich in energy, protein and vitamins in their required amount. Bundy et al (2009) added that the type and quality of food also need to be culturally acceptable.
114. Our review revealed that the school feeding programme is helping to address some of the socio-economic challenges for households such as poverty that usually impacts on poor parents' ability to send their children to schools, especially girls. For instance, in some contexts the school feeding programme accords parents the opportunity to engage in the production and supply of food items to the various schools (Mahama 2018). In this study, parents revealed that their involvement in the school feeding programme, in some contexts, through the supply of the food to schools is helping them to generate some income to be able to provide some basic learning materials and take care of their girls' education needs.
115. The school feeding programme thus serves as motivation for parents to send their children to school, resulting in the increase in the school enrolment, attendance and retentions outcomes we reported. The production and supply of food from local producers means that children and parents will culturally accept the food. In terms of the nutritional adequacy of the food to correct nutritional deficiencies of children, we found limited evidence to help explain this. Only one study examined the micronutrients adequacy of school meals served to children in Ghana, and reported that meals served in the government school programme did meet energy and macronutrient recommendation.

### **Why school-based nutrition interventions might not work in some contexts**

116. Several of the authors provided some explanation for the mixed findings reported, especially those related to school-based nutrition interventions on nutritional status of children. Authors generally reported that high rates of re-infection after treatment pose as a threat to potential effectiveness and sustainability of these interventions. Re-infections were largely attributed to poor sanitation and hygiene practice among schoolchildren within both the school and the children's home environment. Authors also identified lack of regular monitoring and supervision of school meals programmes in schools and issues related to logistical challenges in providing the complex treatment regime required.
117. At a much broader level, studies identified a lack of accountability due to poor monitoring and supervision, and political interference as major barriers to the implementation of the government-supported school feeding programmes in some context. Corruption issues frequently highlighted include the award of contracts to some non-existent companies to supply foods, disappearance of funds allocated (or a lack of accountability) for the running of the school feeding programme, and a deliberate purchase of unwholesome cheaper foodstuff (Salifu et al., 2018; Mahama, 2017; Akuamoah-Boateng & Sam Tagoe, 2018; Abdul-Karim, 2018).
118. Findings from Lynch (2013) suggest that more than 50 percent of parents of children in school feeding programme schools, surveyed were dissatisfied with the quantity and quality of food served to children at schools. The author added that some schoolchildren were rejecting the meals served to them because of the poor quality and taste of the food. Concerning the issue of funding, Akuamoah-Boateng and Sam-Tagoe (2018) reported that, since the withdrawal of the Dutch government financial support to the Ghana School feeding programme in 2010, the programme has suffered severe financial setbacks. The authors went further to reveal that the government has

struggled to raise funds to maintain a timely and regular release of funds to sustain the programme, resulting in local authorities (the municipal assemblies) and school authorities not able to procure enough food to supply to schools nor pay salaries of essential workers such as caterers. Lawson (2012) suggests that such actions could impede the overall impact of social safety net interventions such as the school feeding programme. The author argues that for social interventions of the school feeding scale to work, food supply and distribution must be regular and timely. Failure to adhere to these goals will lead to the intervention not being able to achieve the desired impact. Generally, the key to school feeding interventions is to motivate low income parents to send their children to school, and encourage them to stay, and Lawson argues that it will be hard to imagine that children will enrol and stay in school when the supply of food or quality of school meals regularly fall short of expectation.

## 6.2 HIV interventions

119. This section presents findings of the review of HIV and Water, Sanitation and Hygiene (WASH) interventions delivered within the school environment to improve the health, nutrition and education of children and adolescents in West Africa. We conducted a systematic review to address the following key questions: What is the potential impact of school-based HIV, and WASH interventions on the health, nutrition and education of school age children and adolescents? What are the potential implementation gaps and challenges that are likely to impact the interventions delivery and impact? What are the key lessons learnt (best practices) on school-based HIV and WASH? For the more detail methodology, please see Annex A.

### 6.2.1 Overview of results

120. The search for literature to evaluate the effectiveness of HIV and WASH interventions returned a total of 305 studies. We included a total of 20 studies in the review after a three-stage selection process: titles, abstracts and full texts levels of selection (see PRISMA flow chart in Annex A, figure 9b). 18 of the 20 studies reviewed were academic peer-reviewed studies, and n=2 were non-peer academic review reports. The majority of the studies (n=13) used a pre-post-test quasi experimental design. 7 of the 20 studies were randomised control (including 1 attention matched-control and 1 cluster randomised control trials). Qualitative evidence were assessed for relevance and used to explain why HIV interventions worked or may work within the school environment for school age children and adolescents.

### Study setting and population

121. Out of the 20 studies reviewed, 3 studies were conducted in primary schools, 2 studies were conducted in both primary and secondary/high schools' settings. The remaining 15 studies were conducted exclusively in secondary schools settings (also called Junior or senior high schools) settings. The majority of the studies were from Nigeria (n=15), followed by Ghana (n=3), Cameroon and Liberia had one study each. We excluded studies that investigated impact of HIV and/or WASH interventions implemented out of the school or community settings (with no school implementation components). Beneficiaries of the intervention who were studied were school children aged between 7 and 19 years.

## 6.3 Findings

122. Authors reported that all the HIV interventions were designed to prevent HIV through promotion of positive HIV risk reduction among the target participants (see data extraction results in Annex D). The approaches or strategies used to deliver these interventions were varied: Overall nine different delivery or interventions strategies/approaches were reported in the 20 HIV studies, and they include: i. Peer-led HIV education, ii. Peer-and parent-led HIV education, iii. Peer and health provider-led education, iv. Teacher-led HIV education (family life education), v. Digital storytelling approach

to HIV education, vi. Financial inclusion and/or income generating model, vii. Classroom instructional and drama education, viii. Round Robin Brainstorming and Think Pair-Share instructional education model, and xix. Constructionist theatre instructions education.

123. A total of 15 studies assessed the impact of interventions by comparing baseline and endline outcomes Adeomi et al., 2014; Elebiju et al., 2013, Arnold, 2012; Agbaje, 2015; Ofoegbu et al., 2020; Krugu et al., 2018; Adam and Danawi, 2016; Ezeama et al., 2017; Ezegbe et al., 2018; Ogunsanmi and Agbede, 2020; Adeleye et al., 2014; Fummilayo et al., 2020; Olapeju, no date; Duflo et al., 2012; Anyaegbunam et al. 2014). 4 studies were post-intervention follow up studies (follow duration ranged between 3 months and 4 years) (Masa et al., 2020; Adeomi et al. 2014; Atwood, 2012; Chizoba et al., 2020). One study did not state the length of the intervention, and whether the evaluation was conducted at the end of the intervention or the post- intervention phase (Nwaozuru et al. 2017). The length or duration of the interventions also varied, and ranged from only 4 days (Anyaegbunam et a 2014l, Nigeria) to 6 months (Krugu et al. 2018, Ghana), but on average all interventions lasted for 8 weeks.

### **6.3.1 Impact of HIV interventions**

#### **Peer-led HIV education**

124. We found five studies that examined the effectiveness of school-based HIV prevention interventions using a peer-led education approach in Nigeria and Ghana (Adeomi et al. 2014; Agbaje, 2015; Krugu et al. 2018 Ogunsanmi and Agbede, 2020; Adeleye et al. 2014; Adam and Danawi, 2016). The peer-led approach involved recruitment and training of students to deliver HIV messages to their peers within the school environment. The trainings were delivered in the form of lectures, motivational talks and demonstrations using audio-visuals, posters, role plays and practical demonstration, on content of HIV and sexually transmitted infection and techniques for sharing information. The length of the intervention ranged from 2 to 8 weeks.
125. Overall, the evidence from all six studies reviewed suggest that peer education is beneficial in improving youth sexual and HIV knowledge, as well as helping them to adopt positive behaviours and practices to prevent HIV or reduce risk. In a pre-post-test study in Nigeria, Adeleye and colleagues (2014) found that the level of awareness about HIV and AIDS among students who benefited from a peer-led education increased from 96.5 percent (high baseline awareness) to 100 percent in the study group. Beyond awareness, the students' knowledge about HIV transmission and methods of prevention also increased from 50.0 percent (at baseline) to 86.7 percent (at end of the intervention).
126. The findings reported by Adeomi et al. (2016), also in Nigeria, were similar: Students' knowledge about HIV increased significantly from 50.0 percent at based line to 86.7 percent at end of intervention. The students' attitudes towards HIV/AIDS prevention also changed from 49.0 percent at baseline to 85.6 percent at end of the intervention. During post-intervention follow up (3 months) assessment, the number of sexual partners and promiscuous sexual behaviours among the intervention group had significantly reduced compared to the controlled participants.
127. In Ghana, both Krugu et al. (2018) and Adam and Danawi (2016) reported similar consistent findings demonstrating the effect of peer education on youth HIV knowledge and risk perception. The result from Krugu et al. concluded that the peer education led to a reduction in risk-taking sexual behaviours related to STIs and pregnancy prevention, increased condom use, and STI testing among the participating adolescents. The evidence further suggests that this intervention has potential to increase condom use among adolescents. The percentage change in condom use intentions reported at baseline to end-line was statistically significant.
128. Integrated peer-and parent-led HIV education: We found two Nigerian studies reporting on the impact of an integrated peer-led education intervention (Elebiju et al. 2013; Fummilayo et al 2020).

In separate settings, both studies examined the effect of combination of peers and parents' education approach to deliver HIV education messages to adolescents in schools and at home.

129. The findings of these two studies indicate that a combined parents and peer-led education could have significant beneficial effect on adolescents HIV knowledge, and reduce risk perception. Elebiju et al (2013) study measured the effect of the interventions on HIV risk perception, and reported that about a third of the participants in intervention group had a reduced HIV risk perception score compared to controls. Fummilayo et al on the other hand examined the level of adolescents' self-efficacy following their participation in a peer, and parents-led education HIV service. The results demonstrate a positive impact in increasing adolescents' self-efficacy, significantly higher in the parents-led group. No significant changes in the level of self-efficacy were observed among controls. The parent-led group also recorded a difference increase of 2.182 ( $p < 0.01$ ) self-efficacy post intervention follow-up.

#### **Peer and health provider-led education**

130. We found one Nigerian study reporting on the impact of peer-and health provider-led approach to HIV prevention (Chizoba et al., 2020). Both peer educators and health providers received HIV prevention education training prior to their involvement in delivering HIV education to students. The findings show that intervention had a positive impact on students' HIV knowledge and behaviour risk. The baseline mean knowledge score ( $m=47.8$ ) and mean behaviour risk ( $m= 42.3$ ) recorded before the intervention had increased significantly at the end of the intervention to 72.3 for knowledge and 44.4 for behaviour risk. Willingness to abstain from sex increased from 50% at baseline to 79% at the end of the intervention. The health provider-based group had higher knowledge gain and better behaviour risk reduction compared to the peer-based group, suggesting that the health provider-led education approach maybe more effective compared to the peer-led approach. The authors found no change in the control group.

#### **Teacher-led HIV education**

131. Two studies evaluated this intervention in Nigeria (Arnold et al., 2012; Arnold et al., 2021) and one in Cameroon (Duflo et al., 2012). In Arnold et al. studies in Nigeria, teachers responsible for teaching at least one family life education subject in secondary school were identified and trained as family life health educators (FLHE), so that they can develop skills to deliver HIV messages to students. In the study by Duflo et al., participants were assigned to three intervention groups: basic treatment, where teachers delivered HIV messages to students; a combined basic treatment plus an outside consultant-led, and basic plus consultant and in addition to delivering 'relative risk' messages.
132. Findings showed that, in Cameroon, none of the three interventions reduced HIV risk-taking behaviours. The basic treatment was effective only in the South, while the basic plus consultant-led intervention was effective in the West, ineffective in the South, and even backfired in capital city (Yaoundé). Including the Relative Risk information to the consultant intervention showed some positive effects in the capital city (Yaoundé) but negative ones in the West. The relative risk message yielded no significant impact on any of the life outcomes. In Nigeria, the family life teacher-led education showed some positive effects on rejection of myths, attitudes related to abstinence and use of condoms, and sexuality.

#### **Digital storytelling therapy approach to HIV education**

133. Digital storytelling therapy approach to HIV education, was reported in two Nigerian studies (Ofoegbu et al., 2020; Ezeama et al., 2017). Students recruited to both interventions received 16 structured HIV education sessions over 8 weeks, which aimed to delay sexual initiation, reduce sexually transmitted infections (STIs) and prevent pregnancy. The control group students received no story therapy. The findings reported in both studies were similar, and suggest that the story therapy had a significant effect in increasing knowledge levels and perceived risk of HIV among the



students compared to those who received no story therapy. The study further highlighted that the positive benefits of this intervention were significantly sustained by the treatment group beyond the intervention phase, or post intervention follow-up phase.

#### **Financial inclusion and/or income generating model**

134. Two studies examined impact of this intervention type, one from Ghana (Masa et al., 2020) and one from Nigeria (Nwaozuru et al., 2017). The Massa et al. study was a multiple country study involving Ghana, Columbia, Kenya and Nepal but only data from the Ghana component was included in this review. The study used a financial inclusion model to promote positive HIV behaviours. Youth in the intervention were either provided with access to youth-oriented saving products – opportunity to operate a saving account– to make financial savings/conduct financial transactions with regular visits from bank staff. The bank staff visits provided an opportunity for adolescents to receive sexual health education information, aimed at promoting positive sexual risk behaviours and reducing victimisation. In the Nwaozuru et al., study adolescents received information on HIV risk reduction and training on micro finance and credit to start a financial scheme. Overall, the evidence suggests that the financial inclusion model had no effect in influencing sexual risk behaviours and victimisation. However, the findings from Massa et al. (2020) suggest that the school-based savings (SBS) scheme was significantly associated with higher likelihood of condom use and lower probability of sexual victimisation. The micro-finance scheme delivered and evaluated by Nwaozuru et al., 2017 also showed a significant increase in safe sex efficacy and reductions in sexual risk-taking intentions over time compared to comparison group.

#### **Classroom instructional and drama education approach**

135. Only one Nigerian study investigated this intervention (Ezeama et al. 2017). Students in the intervention arm received 2 hour lessons, incorporating HIV information, per day for 2 days per week over 8 weeks, using different delivery approaches such as group discussion, role plays, demonstrations, chart bills and posters. The results reported show that the drama yielded more positive outcomes in both knowledge gained and in attitudinal change among in-school adolescents than classroom instruction, and no change was noted for the controls. For instance, the data reported show that mean knowledge scores of students increased slightly from 20.5 (baseline) to 22.7 (end-line) for students receiving classroom instruction sessions, 20.4 (baseline) to 22.6 (end-line) for students in the drama intervention arm, and 21.1 to 21.2 for control groups at end-line. At post-intervention follow up, the mean scores for classroom instructions and drama groups increased to 23.9 and 24.5, respectively while the score for the control groups dropped to 20.0±2.8. Scores for attitude for students in classroom instruction arm, drama and control groups decreased from 5.3 (baseline) to 5.1 (for Classroom instruction), but increased slightly from 4.9 to 5.0 for those who participated in the drama session. The attitudes scores for students used as controls dropped from 5.3 to 4.7 at end of the intervention. At post-intervention follow up, the mean knowledge scores for classroom, drama and controls arms were 5.3, 5.6 and 4.5, indicating greater increase among the intervention groups than that of control groups.

#### **Round Robin Brainstorming and Think Pair-Share instructional education model**

136. Round Robin Brainstorming and Think Pair-Share instructional education model, reported in one Nigerian study (Olapeju, no date). HIV prevention activities were implemented with students in the intervention arm using Round Robin Brainstorming (RRB) and Think-Pair-Share (TPS). Briefly, this is a participatory learning method, where individuals in the learning process are given the opportunity to participate – that is, each individual is asked to share their ideas about a topic being discussed. Think-pair-share on the other hand is an interactional learning pedagogy where participants are asked to work in pairs or partnership to address a problem given by their instructor. The instructor poses a question and then asks the participants to think about the problem individually before sharing their ideas about the solution to the problem with their pair/partner. The students were

introduced to these learning approaches prior to their engagement. The evidence reported suggest that the intervention showed a significant positive effect on students' knowledge of HIV/AIDS. Mean knowledge score of the students exposed to the TPS intervention performed best, followed by the RRB. No effect on the controls. In terms of attitudes, the students exposed to TPS demonstrated a higher positive attitude, followed by the RRB and the control group, respectively, post intervention. For HIV risk measured, the results show that students exposed to TPS had the highest post-test mean score of perceived risk followed by those in RRB.

### **Constructionist theatre instructions education approach**

137. This approach was reported in one Nigerian study (Anyaeibunam et al.). The intervention sought to train students in the intervention arm on script writing in HIV and AIDS content areas, and encourage them to write drama on these contents. The intervention was delivered over 4 days, 1hr per week. The evidence, following evaluation at the end of 4 days, indicated that students who participated in the intervention (script writing) had higher mean scores (mean score 61.7) compared to those taught with the conventional method (Mean score 39.3). The mean score of HIV knowledge increased among intervention participants from 41.9 (pre-intervention) to 50.0 (post-intervention) in rural areas, and 37.0 (pre-intervention) to 66.5 (post-intervention) in urban areas.
138. The approach used to deliver HIV prevention education intervention to participants was not clearly stated in one Liberia study (Atwood, 2012). The study by Atwood, conducted in Liberia to promote attitudes and skills for safer sex among adolescent youth in second cycle schools. The education was delivered over 8 weeks, and the authors reported that the intervention significantly impacted protective peer norms and positive condom attitudes and increased frequency of condom use during a nine-month post intervention follow-up. Impact on the number of sex partners was also reported at 3 months post intervention follow-up, but at 9 month follow up no impact was seen. There was no significant impact on sexual initiation rates for the whole sample at 3- and 9-month follow-up.

### **6.3.2 Discussion of results**

139. The cardinal aim of this synthesis was to establish whether school-based HIV interventions are effective in improving the health, nutritional and educational outcomes among school-aged children and adolescents. Across the 20 studies reviewed, we found eight different interventions strategies or approaches that have been implemented within the school environment in West Africa to address HIV in school aged children and adolescents. However, the results from the evaluation of the interventions, reported in the included studies, produced no evidence to demonstrate a direct link between improvement in health of school-aged children and adolescents and the implementation of HIV interventions in schools.
140. None of the studies have investigated the effectiveness of these interventions in reducing HIV or other sexually transmitted infections (STIs) among the target group, neither did the studies examine the effect of the implementation of the intervention on education outcomes (school enrolment, attendance, retention/absenteeism and academic performance). Our review findings, thus, suggest that more studies are needed to investigate the direct impact of school-based HIV interventions on the health status and nutritional of children and their educational attainment. The review results are aligned with several previous reviews, for example, Kirby et al., 2006 and 2007, Underhill et al., 2007a and 2007b, Sani et al., 2016).
141. However, our findings show that, indirectly, the school-based HIV interventions have demonstrated positive impacts in improving the health of school-aged children and adolescents. The key outcomes indicators assessed to establish the impact of the school-based interventions, reported across all 20 included studies are categorised into three broad themes as follows: i). HIV awareness and knowledge (e.g. mode of transmission, preventions), ii). Attitudes and behaviours towards HIV and

its preventive practices (condom use, risk-taking, delayed sexual initiations, sexual behaviour, HIV and other STIs risk perception), and iii). Building self-esteem and self-efficacy/confidence or assertiveness.

142. We found evidence in 10 studies strongly associating school-based interventions with adolescents HIV awareness and knowledge (Adeomi et al, 2014; Chizoba et al., 2020; Ofoegbu et al., 2020; Agbaje 2015; Ezeama et al., 2017; Ogunsanmi and Agbede 2020; Adeleye et al 2014, Olapeju, no date; Anyaegbunam et al., 2014 & Atwood, 2012). We found evidence in 7 studies demonstrating impact in reducing adolescents' risk-taking sexual behaviour or adolescents showing positive attitudes towards HIV prevention, such as condom use or intention to use in the future, delayed initiation of sexual activities and having multiple sex partners (Krugue et al 2018; Masa et al 2020; Agbaje 2015; Ugwuoke et al 2017; Ogunsanmi et al 2020; Ofoegbu et al 2020; Atwood 2012). We found some evidence of reduced risk perception and adolescents' vulnerability to HIV and sexually transmitted infections that were attributed to with the implementation of the school-based HIV interventions (Olapeju, n.d; Ezeagbe et al 2018; Ofoegbu et al 2020; Atwood, 2012).
143. In previous systematic reviews assessing the impact of school-based health education interventions, similar findings have been reported (Kaaya et al 2002; Amaugo et al 2008; Sani et al 2016; Scott-Sheldon et al., 2013), thus confirming that school-based HIV intervention beneficial in changing adolescents' attitudes and behaviours towards HIV and preventive practices. We found a small amount of evidence demonstrating that school-based HIV interventions could be effective in improving self-efficacy, adolescents' sexual confidence and assertiveness (Fummilayo et al 2020; Ogunsanmi et al. 2020). In contrast in Cameroon, Duflo et al. (2012) reported no evidence of effectiveness of school-based HIV intervention in reducing sexual risk-taking. This study also found no evidence associating school-based HIV intervention on life outcomes such as pregnancy, childbearing and schooling. Their findings however agree with earlier studies that suggested that school-based health education interventions programs may not be effective in changing sexual behaviours in sub-in some contexts in Saharan Africa (Kaaya et al, 2002; Gallant and Maticka-Tyndale, 2004). However, given that this was just one piece of research, and evidence reported not peer reviewed, further research will be needed in this context to generate more evidence to support this.
144. We found no data reporting on the direct impact of school-based HIV interventions in improving school-age children and adolescents' health and nutrition status. The evidence available focused primarily on HIV knowledge, and behaviour and attitudinal change towards HIV and its prevention practices – and our findings presented and discussed above clearly demonstrate this. No evidence that school-based intervention improves education outcomes. We found only three studies assessing the impact of School-based HIV intervention on school attendance and academic performance (Anyaegbunam et al 2014; Duflo 2012), and the evidence reported demonstrate no impact. In some contexts, e.g. Cameroon, school-based HIV interventions yield no benefits in changing adolescents' sexual behaviours and improving HIV prevention practices. However, given that the evidence was reported in only one study we are unable to draw a firm conclusion of ineffectiveness. No evidence that financial inclusion models implemented among in-school adolescents promotes positive behaviour practices to prevent HIV infection. But again, the data reviewed is scant to affirm this.
145. Our review show that nine different interventions strategies have been implemented in West Africa to prevent HIV among adolescents: Peer-led HIV education, peer-and parent-led HIV education, peer and health provider-led education, teacher-led HIV education (family life education), digital storytelling approach to HIV education, financial inclusion and/or income generating model, class room instructional and drama education, round robin brainstorming and Think-Pair-Share instructional education model, and constructionist theatre instructions education. Our findings show, except for the financial inclusion model, the remaining models demonstrated very promising

results. The constructionist theatre model may not work if interventions are aimed at changing adolescents' sexual behaviour such as delayed sexual initiation, even in the long term. Although peer education shows increased impact overall, the health provider-based education approach has potential to produce better sexual behaviour risk reduction results.

### **6.3.3 WASH Interventions**

#### Overview of Results

146. The search for literature to evaluate the effectiveness of WASH interventions returned a total of 546 studies. We included a total of 9 studies in the review after a three-stage selection process: titles, abstracts and full texts levels of selection (see PRISMA flow chart in Annex A, figure 9c). These include three studies RCTs, and six pre-post quasi experimental or controlled comparative studies. Qualitative evidence were assessed for relevance and used to explain why WASH interventions worked or may work within the school environment for school age children and adolescents.
147. We found only nine studies reporting on school-based WASH interventions focusing on improving health and education, directly or indirectly, of children in the West Africa region. A total of four broad interventions that were evaluated, were reported by the included studies: Menstrual hygiene management, provision of sanitary pads, basic handwashing/ comprehensive WASH intervention (that includes the distribution of handwashing and drinking water containers, soap and demonstration), and integrated WASH and nutrition intervention linked to school garden programmes.
148. The majority of the included studies did not report the duration of the intervention. Detailed description of the interventions and key findings, reported in the included studies, are presented narratively below.

#### **Findings**

149. Overall four different types of WASH intervention were described/evaluated. The included studies, include: i) comprehensive WASH intervention (including hand washing education), ii) Menstrual hygiene management, iii) Provision of sanitary pads, and iv) Integrated WASH and nutrition intervention. The findings reported by the included studies on the impact of these interventions are presented as follow:

#### **Comprehensive WASH intervention (including hand washing education)**

150. We found six studies that assessed the impact of hand-washing interventions (Garn et al., 2017; Trinies et al., 2016; Chard et al., 2018; Ugwuoke et al., 2017; Akwaah and Siaw, 2019, Ghana; Boubacar and Tohon, 2014)). Garn et al. examined the association between WASH intervention target achievement and school children's health (diarrhoea, respiratory symptoms), and school attendance (absence from school) outcomes. Results reported show that, after 3 years, adherence was inconsistent across schools, but beneficiary schools on average met more WASH targets than matched control schools. Beneficiary schools also met more WASH targets at follow-up than at baseline. Very few of the targets were individually associated with health and absenteeism outcomes.
151. In Niger, Boubacar and Tohon (2014) findings were consistent with the Garn et al. study in Mali. They reported that a significant reduction of self-reported diarrhoea cases and abdominal pain among students in the intervention schools. Student absence increased post-project, but not as much as in control schools. Carriage of at least one parasite reduced in intervention schools, but findings were not statistically significant between intervention and control schools. There was an increase in reported handwashing in intervention schools.

152. In Mali, (Trinies et al., 2016) found that school-based comprehensive intervention was effective in reducing rates of illness, as well as absence due to diarrhoea. No evidence was found in this study to conclude that these health impacts led to a reduction in overall absence. The authors concluded that higher absentee rates are less likely attributable to the intervention than the result of an imbalance in unobserved confounders between study groups. In a similar study in Mali, Chard and colleagues (2018) revealed that a comprehensive school-based intervention was effective in lowering food/water-transmitted enteric disease and person-to-person transmitted enteric diseases among pupils attending beneficiary schools. There was no evidence of impact on lowering in vector-transmitted or parasitic diseases.
153. In Nigeria, a similar intervention (Ugwuoke et al., 2017) reported an increased mean knowledge of hand washing score (from baseline) among the intervention group compared to the comparison group. Handwashing skills also improved among the intervention participants compared to the comparison participants. The conclusion drawn from this study was that handwashing intervention is effective in improving knowledge and skills among school adolescents.
154. In Ghana, Akwaah and Siaw (2019) reported an improvement in the frequency and how students prioritised and washed their hands after visiting the toilet, following the implementation of a hand washing intervention in secondary schools. The results further revealed that prevalence of hand washing after visiting the toilet increased from 64 percent at baseline to 90 percent, after playing games (22 percent to 71.3 percent), and before eating meals (76 percent to 99.6 percent) at end of the intervention.

#### **Menstrual hygiene management**

155. We found only one Ghanaian study reporting on the intervention of menstrual hygiene management (Dorgbetor, 2015, Ghana). The aim of the intervention was to improve knowledge and confidence among secondary school students so that they engage in discussing issues related to menstrual hygiene management, and to promote their positive attitudinal change towards menstrual hygiene practices. Sixty schools were recruited to participate in the intervention, which adopted a play-based approach in promoting menstrual hygiene management, and another 60 schools used as control which did not use the play-based approach. The results show that the use of the play-based approach contributed to improving positive attitudes in boys towards menstruating girls, and improved personal hygiene among the girls. The results further revealed that more teachers and school children in the intervention schools demonstrated considerable knowledge and confidence discussing menstrual hygiene management.

#### **Provision of sanitary pads**

156. We found evidence from one study in Ghana (Montgomery et al., 2012) showing a positive impact of sanitary pad interventions on girls' school attendance. The intervention involved the provision of sanitary pads with puberty education to girls in one arm of the intervention, and puberty education alone in another arm of the intervention, and a control where girls neither received sanitary pads nor puberty education. The authors of this study reported that, after 3 to 5 months of follow up, school attendance among the girls who received pads with education significantly improved, and no significant improvement was noted for the girls who received only puberty education and no intervention. Attendance only improved in the girls who received puberty education alone after 5 months. No improvement in the school attendance was seen in the controls (received neither pads nor puberty education) group.

#### **Integrated WASH and nutrition intervention**

157. This intervention was implemented in Burkina Faso, with the aim to improve the health and nutritional status of school children (Erismann et al., 2017). Participating schools were randomly assigned to two intervention arms, and a control arm: interventions include i. school garden

programme *without* nutrition and wash activities, and ii. Nutrition and WASH intervention *without* school garden. The control group received no intervention. The results reported from the evaluation, after a one-year follow up, indicate that between the baseline and end-line surveys, the prevalence of intestinal parasitic infections decreased in children from both the intervention and control groups (from 90 percent to 62 percent, and from 82 percent to 72 percent, respectively) with a significantly stronger decrease in children from the intervention groups. Adequate handwashing practices before eating and after using latrines at schools increased significantly more among children from the intervention groups. The authors then concluded that the combination of nutritional and WASH-based interventions linked to a school garden programme and delivered through a school platform, holds promise for improving schoolchildren's health and nutritional status.

#### 6.3.4 Discussion

158. To achieve the goal of universal and equitable access to safe and affordable drinking water, sanitation and hygiene, as well as access to basic education for all, the UN Sustainable Development Goals (SDGs) clearly advocate for the expansion of WASH facilities beyond households. Also, some arguments have been advanced, partly supported by academic evidence, suggesting that the provision of WASH facilities with integrated hygiene behaviour change education in schools can contribute to improve the health and educational outcomes of school children within primary and high school settings (Burgers, 2000; Jasper, Le and Bartram, 2012; UNICEF 2012). As a consequence, in 2009, the World Health Organization published a separate protocol that provides guidance for the implementation of water, sanitation, and hygiene interventions in schools in low resource settings. The aim of this section of the review was to synthesise the evidence on school-based WASH interventions to ascertain their effectiveness in improving the health and nutritional status of school-age children and adolescents in the West African region.
159. Our review identified four key WASH interventions that have been developed and implemented within the school environment in West Africa, namely menstrual hygiene management (MHM), provision of sanitary pads, comprehensive WASH intervention (ranging from basic handwashing education to the distribution of handwashing and drinking water containers, soap and demonstration), and integrated WASH and nutrition intervention linked to school garden programmes. Overall, we found mixed evidence of impact of school-based WASH interventions on school-aged children and adolescents' health and education. All five included studies reporting disease-related outcomes found reductions in diarrhoeal disease and other hygiene-related diseases, such as respiratory illness and soil-transmitted helminths, among the students in intervention schools (Erismann et al., 2017; Garn et al., 2017; Boubacar and Tohon 2014; Trinies et al., 2016; Chard et al., 2018). Two studies that investigated intervention effect on parasitic or vector transmitted disease (for example, intestinal parasite infection) in Niger and Mali reported no statistical significant reduction difference between children in intervention and control schools (Boubacar and Tohon 2014; Chard et al., 2018). The evidence also suggests that WASH interventions have made no significant impact in improving education outcomes, as we found no evidence suggesting that school-based WASH intervention improve enrolment, school attendance, or has led to a reduction school absenteeism.
160. We found that all the four studies (Akwaah and Siaw 2019; Garn et al., 2017; Boubacar and Tohon 2014; Ugwuoke et al., 2017) that evaluated handwashing education intervention reported evidence of improved handwashing knowledge and skills. The frequencies of handwashing before eating a meal and after visiting a toilet facility also reported significant improved among students in intervention schools. Furthermore, in Ghana, intervention to promote MHM among in schools show some promising results, as outcomes of Dorgbetor (2015) evaluation suggest an improvement of positive attitudes in boys towards menstruating girls, and improve personal hygiene practices among girls.

161. These findings are consistent with what other previous reviews have reported. For example, in their review to identify and analyse literature to understand the impact of water, sanitation and hygiene interventions (WASH) in schools in low-income countries, McMichael (2018), reported mixed evidence related to the impact of school-based WASH programmes in reducing student absence. Of the 38 studies they included in their review, thirteen studies provide evidence of changes in WASH knowledge, attitudes and behaviours, such as hand-washing with soap, and no evidence of improvement of education was reported. This review also reported evidence to suggest that school-based WASH interventions could have positive benefits in improving disease-related outcomes, although the health outcomes reported did not differ significantly between intervention and control participants, in some contexts. In Israel Rosen et al. (2006), also reported no significant changes in rates of illness or absenteeism following an evaluation of school-based WASH interventions, but impact of significant changes in rates of illness was found in several studies in China (Mwanri et al., 2001; Scott & Vanick 2007; Durán-Narucki 2008). These latest findings contribute to the growing body of research mixed or limited evidence demonstrating the impact of school-based WASH interventions on educational attainment and health improvement among adolescents.

## 7 Challenges and gaps

162. This section discusses the challenges and gaps in implementing school health and nutrition interventions, which were frequently highlighted in the literature.

### 7.1 Lack or inadequate funding and corruption

163. Lack/inadequate of financial capacity of governments in West Africa to successfully fund the implementation of school-based interventions to achieve the desired impact has been strongly highlighted in the literature. In some countries for example, Ghana and Nigeria, inadequate funding has led to irregular and untimely release of funds to schools to manage interventions such as government school feeding and WASH programmes.

164. In the case of school feeding programmes, this has resulted in school managers or authorities not being able to purchase food and pay caterers/kitchen staff on time in Ghana. Evidence from Nigeria suggests that the strain on state budgets has made it difficult to finance state school feeding programmes (for example, Osun State).

165. Corruption issues are frequently highlighted. These include the award of contracts to non-existent companies disappearance of funds allocated for school feeding, lack of accountability) for the running of the school feeding programme, and the deliberate purchase of unwholesome cheaper foodstuff.

166. Lack of funding for school-based interventions also leads to non-availability of essential WASH facilities/commodities such as safe drinking water within the school environment (for most countries). More than 10 countries in West Africa have no WASH facilities/services (especially safe drinking water) in many of the public schools. This impacts on the timely food preparation and the quality of the meals. It has been highlighted that, in some contexts, for example, Ghana, Nigeria and Burkina Faso, students have to sacrifice lesson time to travel long distances to fetch water for the catering staff to prepare meals for them. This potentially, has a negative impact on the quantity as well as on the quality of teaching, and children learning.

167. Availability of teachers and their lack of motivation, as well as inadequate teaching resources to effectively cover sexual and HIV topics in the curriculum have also been identified as key barrier to effective implementation. The lack of motivation has been highlighted as a major issue, especially when teachers do not receive financial compensation for their extra work.

168. The evidence we have presented suggests that the implementation of school feeding programmes has led to a significant increase in school enrolment in some West African countries (at least in the countries where data/evidence is available). However, the main challenge that comes with this increase is the lack of classrooms to accommodate the increase in enrolment, leading to overcrowding in schools. Additionally, inadequate teaching and learning materials have also been cited in some studies. This does impact on effective teaching and learning.

### 7.2 Food insecurity and lack of food-based-dietary guidelines

169. Increased prevalence of food insecurity in many West African countries has also been identified as a major setback to the smooth implementation of school feeding programmes. For instance, food insecurity has led to irregular food supply to schools, and in some context (Ghana and Nigeria) studies have highlighted that some schools resort to buying “cheaper unwholesome foodstuffs” from private local food suppliers (“middle men”) that supply both locally produced foods procured from local farmers, and foods they imported from foreign countries. This undermines the nutrition (nutrient) quality of the meals that children are served at school.



170. However, it could be argued that the decision to patronise locally available perceived as “cheap foodstuff” from these private food suppliers is deliberate, as part of the school feeding programme model, to strengthen the local economy and increase the incomes of local food producers through public-private partnership. Such partnerships are particularly crucial for the sustenance of, e.g. school feeding programmes in the region, as this could potentially increase national food production and job creation.
171. An important challenge is also the lack of school nutrition-specific policies (some West African countries) and no food-based dietary guidelines (all countries) to guide intervention development and implementation to meet targets. Only few countries within the region (Ghana, Nigeria, Mali, Mauritania, Chad, Cote D’Ivoire, Guinea, Togo and Cameroon) have school-based nutrition-specific policies and or strategies to guide implementation of national school feeding programmes. The few school-feeding policies that exist (only eight countries), provide no guidance on nutrient requirements for children to guide menu planning, to ensure that children are eating a diet that is nutritionally balanced.

### **7.3 Capacity/expertise and the school environment**

172. The lack of capacity or expertise of education authorities or school leadership (including teachers) to perform effective monitoring and supervision of the implementation of school-based health and nutrition interventions is a major challenge. Poor supervision or lack of supervision did result in a lack of accountability by school authorities of funds allocated to them to run school-based interventions, in some contexts.
173. In the case of school HIV prevention programmes, it has been highlighted that majority of teachers lack capacity and skills to discuss sexual health issues with their students, including HIV prevention measures such as condom use. This is particularly the case in Cameroon and Nigeria where, although teacher training is an integral part of the governmental strategy for HIV and AIDS prevention education, only a small proportion of teachers have received training on HIV integration into the school curriculum. Those that demonstrate some knowledge and understanding of HIV issues and could discuss HIV topics with their students, do not have the pedagogic skills to teach sexual health and HIV topics. For example, in most contexts, certain lessons related to sexuality have been skipped or shortened for fear that this may promote promiscuity among adolescents. In many schools, teachers are only willing to teach topics on abstinence or continue to use fear-based messages, and have difficulty letting go of traditional cultural beliefs that see sexuality as immoral and taboo and should not be discussed with adolescents.
174. In addition to the knowledge and skills barriers, the school environment has been noted as being at odds with what the programme aims to strengthen. For example how boys and girls are treated within the school social environment by their male and female teachers, as well as the gender and status power differentials between teachers and learners have been observed as factors influencing overall programmes adherence.

### **7.4 Community engagement/participation**

175. Engaging community members to support and participate in the development, implementation, and monitoring/supervision is an important component of school feeding programme models. Low or lack of involvement from community members in these activities could have a negative impact on the overall success of school feeding interventions. For example, a few Ghanaian studies have identified poor involvement and participation of community members/leaders as a major challenge contributing to the lack of programme success. These studies highlighted non-participation of community leaders in school management meetings of which they are members, as well as the supervision and monitoring of school feeding activities within their communities. The reasons for

this lack of involvement or participation were not explored, studies only mentioned lack of motivation may be influencing this.

### **7.5 Lack of WASH facilities and sub-optimal intervention delivery**

176. For deworming programmes, the intervention effect was impacted negatively by the high rates of parasitic re-infection after treatment, which was attributed to poor sanitation and hygiene practices due to low access to WASH facilities, among schoolchildren, within both the school and home environments. More generally, for WASH interventions, the multiple burden of disease rates (co-morbidity), pathogen-pathways within the school and home environments, increasing student populations, and baseline WASH conditions such as water unavailability, and the broader social, political and economic issues have been identified and discussed as issues that needs to be carefully addressed, if WASH interventions are to be effective.
177. Another area of concern was sub-optimal intervention delivery, including low programme fidelity, that is, programmes not delivered as intended. Freeman et al. (2014) captured this well by saying “suboptimal intervention fidelity often means that researchers evaluate the effectiveness of interventions in real-world settings, not ideal ‘best practice’ for WASH environments”.

## 8 Conclusions and lessons learned

### 8.1 Conclusions

178. This review was designed to synthesise evidence from published literature on the impact of school-based health (HIV, WASH and deworming) and nutrition (school-feeding, micronutrients supplementation and nutrition education) interventions on the health, nutritional and educational outcomes among school-aged children and adolescents. We found evidence suggesting that school-based nutrition interventions are effective in increasing school enrolment, attendance and retention in West Africa. We found no evidence demonstrating the impact of such interventions on academic achievement, but this could be due to the limited number of studies that examined this outcome.
179. For HIV interventions, we did not find any studies examining the link between school-based HIV interventions and the health and nutrition status of children and adolescents. The evidence available focused primarily on HIV knowledge, risk perception and behaviour and attitudinal change towards HIV and its prevention practices. We found evidence demonstrating a strong link between school-based HIV interventions and adolescents' HIV awareness, increased knowledge and positive sexual behaviours, as well a significant reduction in HIV risks perceptions have been documented.
180. In the case of WASH interventions, we found mixed evidence linking these interventions to the health and education of school-aged children and adolescents. All the included studies that were reviewed demonstrated positive impacts in terms of reduction of WASH related diseases such as diarrhoeal and respiratory illness, and soil-transmitted helminths. For deworming interventions, although the evidence appears to suggest that they have the potential to reduce the risk of parasitic infections that could subsequently lead to a reduction in school absenteeism, there were limited studies in the West Africa region to review to draw such conclusion.
181. Given the limited studies in the region we are unable to draw firm conclusions on the ineffectiveness of these school-based interventions. Overall, the review findings suggest that there is a window of opportunity for further studies, using randomised trials designs, to evaluate impact of HIV and WASH interventions in schools more robustly – especially the impact of such interventions on improving health and educational outcomes for school-aged children and adolescents.

#### Literature gaps

- a) Difficult to do a thorough review and assessment of the situation of school health and nutrition, and interventions to improve health and nutritional status among school children and adolescents when data is unavailable or limited in many countries in the regions.
- b) An important gap identified in this review is that, although many countries in West Africa appear to be implementing school-based health and nutrition interventions, evaluation of these interventions have not been carried out in all countries, and at the national levels, to measure their effectiveness. This is because our search, using a robust search strategy, located very few studies in some in 7 out of the 19 countries in West Africa, and none at all in many countries where we believe these interventions are being delivered.
- c) Apart from Ghana and Nigeria, we found only a handful of studies from the remaining six countries (Mali=3, Burkina Faso=3, Niger=1, Cameroon =1, Liberia=1) that examined the impact of school-based health and nutrition interventions, and of these only two studies had reported on gender-specific impact of school feeding.
- d) We did not find studies that specifically examined the quality of school meals provided to children, although a few of the studies we reviewed reflected on this in their discussions

and indicated that, in some context, students and parents were disappointed with the quantity and quality of food served.

- e) We also identified a gap in the quantitative literature because there is no sufficient statistical information to perform a meta-analysis of the data to understand the overall effect of school –based health and nutrition interventions on the nutritional, health and education outcomes of children and adolescents who are benefiting from such interventions. The available quantitative studies were not homogenous in their designs, data collection, analysis and outcomes.

## 8.2 Key lessons

182. The review identified several lessons that the WFP Regional Bureau Dakar may wish to consider in the development of plans for the implementation of the WFP Global School Feeding Strategy in countries in the West Africa region.

- a) School-based health and nutrition interventions can bring more children to schools, but their benefits can be better harnessed if marginalised and vulnerable groups including girls and orphans are prioritised. Interventions should also be inclusive of children and adolescents in deprived urban and rural communities, where school enrolments are usually low, and should ensure that no child or adolescent is left behind.
- b) Increased enrolment resulting from school feeding programmes poses threats to the already overstretched government resources of West African states. This may impact on governments' ability to meet any growing enrolment demand, as well as the sustainability of the school feeding programmes, they have established. Stronger partnerships with other development actors including the private sector and philanthropic organizations are crucial to addressing increasing demand for school enrolment, and the sustainability school-based health and nutrition interventions. Partnerships with communities where school-based interventions are implemented are also important for the sustainability of these interventions.
- c) Children enrolled in schools as a result of school feeding programmes are more likely to remain and complete school if their expectations, and the expectations of their parents about the quantity and quality of meals served to children are met. Prioritising and addressing these issues are, essential to maximising the documented benefits of school feeding programmes.
- d) An important lesson is that culturally appropriate food provided as school meals is paramount to achieving school feeding effectiveness and long-term sustainability. This can be achieved by engaging and encouraging the participation of community members (local farmers) to produce and supply local foodstuff to schools that are involved school feeding.
- e) Teachers, parents and school staff all play crucial unique roles towards the running of school health and nutrition programmes. Therefore, engaging them and building their capacity to equip them with the knowledge and skills they need to perform their respective roles can contribute to maximising the benefits of school-based interventions. It is also essential that the roles of teachers in school-based interventions are clear, particularly in HIV prevention interventions. The review revealed that there is no clear guidance and that school authorities are often unsure whether HIV prevention interventions should be the duty of teachers, or whether it should be left to specialised health professionals. Trained schoolteachers, supported by specialised health professionals that rotate across schools could be considered.

- f) Peer, and teachers, and parents-led education approaches, digital storytelling and classroom instructions, incorporating drama sessions are important HIV prevention strategies to enhance adolescents' positive sexual and HIV risk perception and knowledge/awareness. A combination of regular classroom instructions and drama yields more positive outcomes in both knowledge gained and in attitudinal change among in-school adolescents than classroom instructions alone.
- g) School-based health and nutrition interventions can be more effective if they are designed and implemented as integrated interventions as opposed disconnected, parallel interventions. For example, combining deworming interventions with an integrated WASH interventions can address the problem of repeated parasitic re-infection after treatment.
- h) Huge financial investments are needed to support capacity building of teachers, and strengthen school monitoring and evaluation systems to facilitate delivery and effectiveness of school-based interventions. This can be achieved through partnerships with the private sector but also with governments' development partners.
- i) The effectiveness of school-based health and nutrition interventions and the sustainability of the results achieved are greatly influenced by the conditions in the broader environment. It is essential to take the local context into account when designing and implementing school-based health and nutrition interventions.

## References

- Abayomi, O., & Bukari, M. (2014). Educational outcomes of school feeding intervention: Evidence from rural Northern Ghana. *Russian Journal of Agricultural and Socio-Economic Sciences*, 27(3).
- Abdul-Kudus Mohammed (2011) Evaluation of the school feeding programme and pupils' academic performance in Ghana: a study of the catholic relief service feeding programme in Savelugu/Nanaton District (Masters dissertation, University of Cape Coast, Ghana).
- Abizari, A. R., Buxton, C., Kwara, L., Mensah-Homiah, J., Armar-Klemesu, M., & Brouwer, I. D. (2014). School feeding contributes to micronutrient adequacy of Ghanaian schoolchildren. *British Journal of Nutrition*, 112(6), 1019-1033.
- Adekunle, D. T., & Christiana, O. O. (2016). The Effects of School Feeding Programme on Enrolment and Performance of Public Elementary School Pupils in Osun State, Nigeria. *World Journal of Education*, 6(3), 39-47.
- Adeleye, A. A., Adeoye, O. A., Asekun-Olarinmoye, E. O., Abodunrin, O. L., Olugbenga-Bello, A. I., & Sabageh, A. O. (2014). Evaluation of the effectiveness of peer education in improving HIV knowledge, attitude, and sexual behaviours among in-school Adolescents in Osun State, Nigeria. *AIDS Research and Treatment*, 2014.
- Agbaje, F. O., & Makanjuola, F. (2015). P03. 07 Mitigating the impact of hiv/aids among in and out of school youth through peer education using family life hiv education in federal capital territory abuja nigeria.
- Agbozo, F., Atitto, P., Jahn, A., & Abubakari, A. (2018). Nutrient composition and dietary diversity of on-site lunch meals, and anthropometry of beneficiary children in private and public primary schools in Ghana. *Nutrition and health*, 24(4), 241-249.
- Akanbi, G. O. (2011). Home grown school feeding and health programme in Nigeria: An approach to boosting enrollment in public primary schools: A study of Osun state 2002-2010. In *Afr Symp* (Vol. 11, pp. 20-8).
- Akwaah, v., & Siaw, W. N (2017) Intervention strategy in hand washing among boarding students in selected senior high school, Mampong municipality.
- Aliu, M., & Fawzia, S. (2014). Assessing Ghana school feeding programme on the enrollment of beneficiary schools in the Tamale Metropolitan Assembly of Northern Ghana. *International Journal of Economics, Commerce and Management*, 2(10), 1-30.
- Amaugo, L. G., Papadopoulos, C., Ochieng, B. M., & Ali, N. (2014). The effectiveness of HIV/AIDS school-based sexual health education programmes in Nigeria: a systematic review. *Health education research*, 29(4), 633-648.
- Ampofo, J. A., & Pac, M. T. (2020). The impact of Ghana School Feeding programme on girls' enrolment and attendance in St Cecilia Primary School, Sombo in Wa Municipality. *International Journal of Applied Research in Social Sciences*, 2(4), 79-96.
- Amponsah, E. A. (2018). The Ghana School Feeding Programme, Home Environment and Learning Outcomes (Doctoral dissertation, University of Ghana).
- Anero, N. (2020). Comparison Of Pupils' Completion Rate Before And During 2006/2007 School Feeding Programme In Selected Public Primary Schools In Rivers State, Nigeria. *Advances in Social Sciences Research Journal*, 7(3),
- Antwi, J., Ohemeng, A., Boateng, L., Quaidoo, E., & Bannerman, B. (2020). Primary school-based nutrition education intervention on nutrition knowledge, attitude and practices among school-age children in Ghana. *Global Health Promotion*, 1757975920945241.

Anyaegbunam, N. J., Okere, A., & Onyechi, K. C. (2014). Effect of Constructivist Theatre Instruction (CTI) on Secondary School Students' Knowledge of HIV and AIDS. *International Journal of Research in Arts and Social Sciences (IJRASS)*, 7(1), 210-220.

Arnold, R., Maticka-Tyndale, E., Tenkorang, E., Holland, D., Gaspard, A., Luginaah, I., & HP4RY team. (2012). Evaluation of school-and community-based HIV prevention interventions with junior secondary school students in Edo State, Nigeria. *African Journal of Reproductive Health*, 16(2), 103-125.

Arnold, R., Maticka-Tyndale, E., Tenkorang, E., Holland, D., Gaspard, A., Luginaah, I., & HP4RY team. (2012). Evaluation of school-and community-based HIV prevention interventions with junior secondary school students in Edo State, Nigeria. *African Journal of Reproductive Health*, 16(2), 103-125.

Atwood, K. A., Kennedy, S. B., Shamblen, S., Tegli, J., Garber, S., Fahnbulleh, P. W., ... & Fulton, S. (2012). Impact of school-based HIV prevention program in post-conflict Liberia. *AIDS Education and Prevention*, 24(1), 68-77.

Aurino, E., Gelli, A., Adamba, C., Osei-Akoto, I., & Alderman, H. (2020). Food for Thought? Experimental Evidence on the Learning Impacts of a Large-scale School Feeding Program. *Journal of Human Resources*, 1019-10515R1.

Awolu Adam, Hadi Danawi. Motivating Positive Condom Use Intentions among High School Students Through Teacher-Student Led HIV/AIDS Education Program in a Rural District of Ghana. *Central African Journal of Public Health*. Vol. 2, No. 1, 2016, pp. 28-34. doi: 10.11648/j.cajph.20160201.15

Ayi, I., Nonaka, D., Adjovu, J. K., Hanafusa, S., Jimba, M., Bosompem, K. M., ... & Kobayashi, J. (2010). School-based participatory health education for malaria control in Ghana: engaging children as health messengers. *Malaria Journal*, 9(1), 98.

Azagba-Nyako, J. (2017). Public health nutrition intervention to evaluate the nutritional impact of the Ghana School Feeding Programme in Lower Manya Krobo (LMK) district, and enhancing its effectiveness through a nutrition intervention (Doctoral dissertation, University of Westminster).

Boubacar Mainassara, H., & Tohon, Z. (2014). Assessing the health impact of the following measures in schools in Maradi (Niger): Construction of latrines, clean water supply, establishment of hand washing stations, and health education. *Journal of parasitology research*, 2014.

Bukari, M. (2015). Does In-School Feeding Program Have Effect on Enrolment and Academic Performance? The Case of Public Primary Schools in Northern Ghana. *ADRRJ Journal of Arts and Social Sciences*, 13(1), 1-21.

Chard, A. N., Trinies, V., Moss, D. M., Chang, H. H., Doumbia, S., Lammie, P. J., & Freeman, M. C. (2018). The impact of school water, sanitation, and hygiene improvements on infectious disease using serum antibody detection. *PLoS neglected tropical diseases*, 12(4), e0006418.

Chizoba, A. F., Chineke, H. N., Adogu, P. O. U., Nwafia, A. E., & Chizoba, C. J (2021) Effects of Peer and Provider-Based Education Interventions on HIV/AIDS Knowledge and Behaviour-Risk among in-School Adolescents in Ebonyi State, Nigeria. *Asian Journal of Medicine and Health*.

Danquah, A. O., Amoah, A. N., Steiner-Asiedu, M., & Opare-Obisaw, C. (2012). Nutritional status of participating and non-participating pupils in the Ghana School Feeding Programme. *Journal of Food Research*, 1(3), 263.

Davidson G.I, and N. M. Eze (2012) Comparison of nutritional status of children participants and non-participants in government school-meal-plus programme in Nsukka local government area of Enugu State.

- Diderutu, E. K. (2018). Ghana school feeding programme and its effects on enrollment and retention among selected basic schools in the Kassena Nankana West District (Doctoral dissertation, University of Education, Winneba).
- Duflo, E., Dupas, P., Seban, J., & Huillery, E. (2012). Impacts of School-Based HIV Education on Reported Behavior and Knowledge of Adolescent Girls, Evidence from Cameroon. *Sciences Po publications*, (info: hdl: 2441/7o52iohb7k6srk09na411ea4k).
- Enwereji, E. E., Martina, M. E., & Oladepo, O. O. (2018). Strategies for HIV AND AIDS Prevention Programmes among In-School Adolescents in Imo State, Nigeria. *Journal of Therapy & Management in HIV Infection*, 6, 16-22.
- Erismann, S., Diagbouga, S., Schindler, C., Odermatt, P., Knoblauch, A. M., Gerold, J., ... & Cissé, G. (2017). Schoolchildren's intestinal parasite and nutritional status one year after complementary school garden, nutrition, water, sanitation, and hygiene interventions in Burkina Faso. *The American journal of tropical medicine and hygiene*, 97(3), 904-913.
- Ezeama, M. C., Enwereji, E. E., & Onyekwere, I. A. (2017). Intervention programmes for HIV and AIDS prevention: a study of in-school adolescents in Orlu Senatorial Zone of Imo State, Nigeria. *International Journal of Advances in Medicine*, 4(5), 1212.
- Ezegbe, B., Eseadi, C., Ede, M. O., Igbo, J. N., Aneke, A., Mezieobi, D., ... & Effanga, O. A. (2018). Efficacy of rational emotive digital storytelling intervention on knowledge and risk perception of HIV/AIDS among schoolchildren in Nigeria. *Medicine*, 97(47).
- Funmilayo, O. M., & Juliana, E. O. (2020). Self-efficacy as a correlate of HIV prevention among in-school adolescent in Ogun State, Nigeria: a peer and parent-led education intervention. *IFE Psychologia: An International Journal*, 28(1), 73-81.
- Galaa, S., & Saaka, M. (2011). Running an effective and sustainable school feeding programme: key factors to consider. *Journal of Social Development in Africa*, 26(2), 39-65.
- Garn, J. V., Trinies, V., Toubkiss, J., & Freeman, M. C. (2017). The role of adherence on the impact of a school-based water, sanitation, and hygiene intervention in Mali. *The American journal of tropical medicine and hygiene*, 96(4), 984-993.
- Gelli, A., Aurino, E., Folson, G., Arhinful, D., Adamba, C., Osei-Akoto, I., ... & Alderman, H. (2019). A School meals program implemented at scale in Ghana increases height-for-age during midchildhood in girls and in children from poor households: a cluster randomized trial. *The Journal of nutrition*, 149(8), 1434-1442.
- Gelli, A., Masset, E., Folson, G., Kusi, A., Arhinful, D. K., Asante, F., ... & Agble, R. (2016). Evaluation of alternative school feeding models on nutrition, education, agriculture and other social outcomes in Ghana: rationale, randomised design and baseline data. *Trials*, 17(1), 37.
- George Dorgbetor (2015) mainstreaming MHM in schools through the play-based approach: Lessons learned from Ghana. January 2015. *Waterlines* 34(1):41-50.
- Humphries, D., Nguyen, S., Kumar, S., Quagraine, J. E., Otchere, J., Harrison, L. M., ... & Cappello, M. (2017). Effectiveness of albendazole for hookworm varies widely by community and correlates with nutritional factors: a cross-sectional study of school-age children in Ghana. *The American journal of tropical medicine and hygiene*, 96(2), 347-354.
- Humphries, D., Simms, B. T., Davey, D., Otchere, J., Quagraine, J., Terryah, S., ... & Wilson, M. (2013). Hookworm infection among school age children in Kintampo north municipality, Ghana: nutritional risk factors and response to albendazole treatment. *The American journal of tropical medicine and hygiene*, 89(3), 540-548.



- Hürlimann, E., Hougbedji, C. A., Prisca, B. N., Bänninger, D., Coulibaly, J. T., Yap, P., ... & Utzinger, J. (2014). Effect of deworming on school-aged children's physical fitness, cognition and clinical parameters in a malaria-helminth co-endemic area of Côte d'Ivoire. *BMC infectious diseases*, *14*(1), 411.
- Kazianga, H., De Walque, D., & Alderman, H. (2012). Educational and child labour impacts of two food-for-education schemes: Evidence from a randomised trial in rural Burkina Faso. *Journal of African Economies*, *21*, 723-760. doi: 10.1093/jae/ejs010.
- Koya, a. o. (2014) effects of Roundrobin brainstorming and think-pair-share instructional strategies on secondary school students 'knowledge, attitude and perceived risk of HIV/AIDS in Osun state, Nigeria (doctoral dissertation).
- Krugu, J. K., Mevissen, F. E., Van Breukelen, G., & Ruiter, R. A. (2018). SPEEK: Effect evaluation of a Ghanaian school-based and peer-led sexual education programme. *Health education research*, *33*(4), 292-314.
- Kwabla, M. P., Gyan, C., & Zotor, F. (2018). Nutritional status of in-school children and its associated factors in Denkyembour District, eastern region, Ghana: comparing schools with feeding and non-school feeding policies. *Nutrition journal*, *17*(1), 8.
- Lawson, T. M. (2012). Impact of school feeding programs on educational, nutritional, and agricultural development goals: a systematic review of literature (No. 1097-2016-88667).
- Lezama, I., Lockwood, K., & Bergmann, T. (2001). Nutrition intervention strategies in chronically malnourished regions: preventing endemic goitre in Togo. *Public health nutrition*, *4*(6a), 1415-1419.
- Lynch, A. (2013). Inaction or In Action, The Effectiveness of The Ghana School Feeding programme: The Case of Ntranoa School, Cape Coast, Ghana (Doctoral dissertation, Masters' Thesis, University of Limerick, Ollscoil Luimnigh: Retrieved from: [http://www. ul. ie/ppa/content/files/Amy\\_Lynch.pdf](http://www.ul.ie/ppa/content/files/Amy_Lynch.pdf)).
- Mahama, S. U. M. A. I. L. A. (2018). The impact of Ghana school feeding programme on female enrolment, attendance and retention in the Wa Municipality of the Upper West Region of Ghana (Masters of Philosophy dissertation).
- Masa, R., Chowa, G., & Sherraden, M. (2020). An evaluation of a school-based savings program and its effect on sexual risk behaviors and victimization among young Ghanaians. *Youth & Society*, *52*(7), 1083-1106.
- Mason-Jones, A. J., Sinclair, D., Mathews, C., Kagee, A., Hillman, A., & Lombard, C. (2016). School-based interventions for preventing HIV, sexually transmitted infections, and pregnancy in adolescents. *Cochrane Database of Systematic Reviews*, (11).
- Montgomery, P., Ryus, C. R., Dolan, C. S., Dopson, S., & Scott, L. M. (2012). Sanitary pad interventions for girls' education in Ghana: a pilot study. *PloS one*, *7*(10), e48274.
- Musah Bukari (2013) the effect of school dfeeding programme on enrolment and academic performance of pupil in Garu-Tempene District, Upper East Region, Ghana (Masters of Philosophy dissertation, Universioty for Development Studies, Ghana).
- Nikiema, P. R. (2017). Impact of school feeding programmes on educational outcomes: Evidence from dry cereals in schools in Burkina Faso (No. 2017/182). WIDER Working Paper.
- Oduro-Ofori, E., & Yeboah-Gyapong, A. (2014). The Contribution of the Ghana Schools Feeding Programme to Basic School Participation: A Study of Selected Schools in the Kwaebibirim District of Ghana.

Ofoegbu, T. O., Otu, M. S., Christopher, I., Uche, A., Nwabuko, L. O., Ebere, I., ... & Muhammed, A. (2020). Impact of an educational digital storytelling intervention on HIV risk perception among Nigerian adolescents. *Journal of International Medical Research*, 48(1), 0300060519854635.

Ofosu, H. A., & Ako-Nnubeng, I. T. The Impact of the School Based Deworming Program on Education in the Kwahu West Municipality of Ghana.

Ololade, O. O., & Catherine, O. (2020). The Effect of Peer-led Sexuality Education and Telephone Health-messaging on Sexual Self-esteem and Assertiveness: A School-based Intervention among Adolescents in Ibadan, Nigeria. *Journal of Psychosocial Research*, 15(1), 255-269.

Owusu, J. S., Colecraft, E. K., Aryeetey, R. N., Vaccaro, J. A., & Huffman, F. G. (2016). Comparison of two school feeding programmes in Ghana, West Africa. *International Journal of Child Health and Nutrition* 5(2)

Salifu I, Boateng JK, Kunduzore S (2018)S. Achieving free compulsory universal basic education through school feeding programme: evidence from a deprived rural community in northern Ghana. *Cogent Educ.* 5(1).

Sufiyan, M. B., Sabitu, K., & Mande, A. T. (2011). Evaluation of the effectiveness of deworming and participatory hygiene education strategy in controlling anemia among children aged 6-15 years in Gadagau community, Giwa LGA, Kaduna, Nigeria. *Annals of African medicine*, 10(1).

Tijjani, S. A., Kaidal, A., & Garba, H. (2017). Appraisal of Government Feeding Programme on Increased School Enrollment, Attendance, Retention and Completion among Secondary School Students in Maiduguri, Borno State. *International Journal of Education and Practice*, 5(9), 138-145.

Trinies, V., Garn, J. V., Chang, H. H., & Freeman, M. C. (2016). The Impact of a school-based water, sanitation, and hygiene program on absenteeism, diarrhea, and respiratory infection: a matched-control trial in Mali. *The American journal of tropical medicine and hygiene*, 94(6), 1418-1425.

UGWUOKE et al (2017). Effect of Hand Washing Education on Primary School Pupils in Nkanu West Local Government Area (Lga) of Enugu State, Nigeria. *International Journal of Social Research*, 2017; 1:3.

### Other references

Adelman, S., Gilligan, D., & Lehrer, K. (2008). How effective are food for education programs?: A critical assessment of the evidence from developing countries (Vol. 9). *Intl Food Policy Res Inst.*

Adesola Ogunfowokan & Reuben B Fajemilehin (2012) Impact of a School-Based Sexual Abuse Prevention Education Program on the Knowledge and Attitude of High School Girls. May 2012. *The Journal of School Nursing* 28(6).

African Development Bank Group (2020) West African economic outlook 2020: Coping with the covid 19 pandemic: Accessed from: <https://www.afdb.org/en/documents/west-africa-economic-outlook-2020-coping-covid-19-pandemic>.

African Union (2018). Sustainable School feeding across the African Union. Accessed from: <https://au.int/en/documents/20181008/sustainable-school-feeding-report>

Awusabo-Asare, K., Abane, A. M., & Kumi-Kyereme, A. (2004). *Adolescent sexual and reproductive health in Ghana: A synthesis of research evidence*. New York, NY: Alan Guttmacher Institute.

Best, C., Neufingerl, N., Van Geel, L., van den Briel, T., & Osendarp, S. (2010). The nutritional status of school-aged children: why should we care? *Food and nutrition bulletin*, 31(3), 400-417

Bundy, D., Burbano, C., Grosh, M. E., Gelli, A., Juke, M., & Lesley, D. (2009). Rethinking school feeding: social safety nets, child development, and the education sector. *The World Bank*.

Burbano, C., Ryckembusch, D., Fernandes, M., Mitchell, A., & Drake, L. (2017). Reimagining school feeding: a high return investment in human capital and local economies. *Bundy DAP, de Silva N, Horton S, Jamison DT, Patton G, editors. Disease control priorities, 8*.

Contento, I., Balch, G. I., Bronner, Y. L., Lytle, L. A., Maloney, S. K., Olson, C. M., & Swadener, S. S. (1995). The effectiveness of nutrition education and implications for nutrition education policy, programs, and research: a review of research. *Journal of nutrition education (USA)*.

Drake, L., Russo, R., & Defeyter, M. G. A. (2017) the impact of School Food Consumption on Children's Cognition, Educational attainment and Social development. *Frontiers in public health, 5*, 204.

Drake, L., Woolnough, A., Bundy, D., & Burbano, C. (Eds.). (2016). Global school feeding sourcebook: lessons from 14 countries. *World scientific. Imperial College Press, London*.

ECOWAS (2020). COVID-19 Pandemic: Impact of restriction measures: West Africa [http://www.food-security.net/wp-content/uploads/2020/12/Covid-19-Pandemic\\_Impact-of-Restriction-Measures-in-West-Africa\\_December-2020.pdf](http://www.food-security.net/wp-content/uploads/2020/12/Covid-19-Pandemic_Impact-of-Restriction-Measures-in-West-Africa_December-2020.pdf)

Food Crisis Prevention Network (2020). Sahel and West Africa: Food security and nutrition situation: December 2020. [http://www.food-security.net/wp-content/uploads/2020/12/Regional-snapshot-Dec2020\\_bilingual.pdf](http://www.food-security.net/wp-content/uploads/2020/12/Regional-snapshot-Dec2020_bilingual.pdf)

[Food Crisis Prevention Network and Global Network Against Food Crises \(2021\), Global Report on Food Crises, Rome, 2021, https://www.wfp.org/publications/global-report-food-crises-2021](https://www.wfp.org/publications/global-report-food-crises-2021)

Frongillo Jr, E. A. (1999). Symposium: causes and aetiology of stunting. *J Nutr, 129*(2S Suppl), S529-30.

Gallant M, Maticka-Tyndale E. School-based HIV prevention programmes for African youth. *Soc Sci Med.* 2004;58(7):1337-51.

Hunter, D., Giyose, B., PoloGalante, A., Tartanac, F., Bundy, D., & Mitchell, A. (2017). Schools as a System to Improve Nutrition: A new statement for school-based food and nutrition interventions. United Nations System Standing Committee On Nutrition. September, 2017.

Jasper, C., Le, T. T., & Bartram, J. (2012). Water and sanitation in schools: a systematic review of the health and educational outcomes. *International journal of environmental research and public health, 9*(8), 2772-2787.

Kaaya SF, Mukoma W, Flisher AJ, Klepp K-I. School-Based Sexual Health Interventions in Sub-Saharan Africa: A Review. *Soc Dyn.* 2002; 28(1):64-88.

Martorell, R. (1992). Long-term consequences of growth retardation during early childhood. *Human growth: basic and clinical aspects*, 143-149.

Mavedzenge SN, Luecke E, Ross DA. Effective approaches for programming to reduce adolescent vulnerability to HIV infection, HIV risk, and HIV-related morbidity and mortality: a systematic review of systematic reviews. *JAIDS J Acquir Immune Defic Syndr.* 2014;66:S154-69.

Mwale, M., & Muula, A. S. (2017). Systematic review: a review of adolescent behavior change interventions [BCI] and their effectiveness in HIV and AIDS prevention in sub-Saharan Africa. *BMC public health, 17*(1), 1-9.

UNAIDS. The Gap Report'. Geneva: UNAIDS; 2014.

Partnership for Child Development. (1998). The health and nutritional status of schoolchildren in Africa: evidence from school-based health programmes in Ghana and Tanzania. *Transactions of The Royal Society of Tropical Medicine and Hygiene*, 92(3), 254-261.

Paul-Ebhohimhen VA, Poobalan A, Teijlingen ER. A systematic review of school-based sexual health interventions to prevent STI/HIV in sub-Saharan Africa. *BMC Public Health*. 2008;8:4(1).

Report to ECOWAS beyond 2020: Crisis drivers in West Africa's Future (2020): Accessed from: <https://www.humanitarianfutures.org/wp-content/uploads/2013/06/Report-to-ECOWAS-Beyond-2020-Crisis-Drivers.pdf>.

Sani, A. S., Abraham, C., Denford, S., & Ball, S. (2016). School-based sexual health education interventions to prevent STI/HIV in sub-Saharan Africa: a systematic review and meta-analysis. *BMC public health*, 16(1), 1-26.

Slutsky, J., Atkins, D., Chang, S., & Sharp, B. A. C. (2014). Foreword. Comparing Medical Interventions: AHRQ and the Effective Health Care Program. *Methods Guide for Effectiveness and Comparative Effectiveness Reviews*, 1.

Snilstveit, B., Stevenson, J., Phillips, D., NatCen, M. V., Gallagher, E., Schmidt, T., & Evers, J. (2019). Interventions for improving learning outcomes and access to education in low-and middle-income countries: a systematic review. London: International Initiative for Impact Evaluation, 2015.

Stover J, Walker N, Garnett GP, Salomon JA, Stanecki KA, Ghys PD, Grassly NC, et al. Can we reverse the HIV/AIDS pandemic with an expanded response? *The Lancet*. 2002; 360: 73–7

Thériault, F. L., Maheu-Giroux, M., Blouin, B., Casapía, M., & Gyorkos, T. W. (2014). Effects of a post-deworming health hygiene education intervention on absenteeism in school-age children of the Peruvian Amazon. *PLoS Negl Trop Dis*, 8(8), e3007.

Tull, K., & Plunkett, R. (2018). School feeding interventions in Humanitarian Responses. Accessed from: <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/14090>.

UNDP. Human Development Report 2020: The next frontier. New York, New York, UNDP, 2020. <http://hdr.undp.org/sites/default/files/hdr2020.pdf>

UNICEF. Raising even more clean hands: advancing health, learning and equity through WASH in schools. New York, NY, USA: UNICEF; 2012.

UNICEF. The impact of HIV/AIDS on education in Kenya and the potential for using education in the widest sense for the prevention and control of HIV/AIDS. A Kenya and UNICEF Kenya Country Office Study. Nairobi, Kenya: UNICEF; 2000

UNICEF. Water, sanitation and hygiene (WASH) in schools. Child Friendly Schools Manual. New York, New York: UNICEF; 2012.

WFP. (2013). State of school feeding worldwide 2013. Accessed from: <https://documents.wfp.org/stellent/groups/public/documents/communications/wfp257481.pdf>.

WHO & Consultation, F. E. (2003). Diet, nutrition and the prevention of chronic diseases. *World Health Organ Tech Rep Ser*, 916(i-viii).

WHO World Health Report (2002) Reducing Risks, Promoting Healthy Lives Geneva: World Health Organization.

World Bank Group (2016) School Health and School Feeding. Education Global Practice, Smarter education systems for Brighter Future. SABER.

World Health Organization (WHO). *Water, Sanitation and Hygiene Standards for Schools in Low-Cost Settings*; WHO: Geneva, Switzerland, 2009.

World Health Organization. (1995). Physical status: The use of and interpretation of anthropometry, Report of a WHO Expert Committee. *World Health Organization*.

World Health Organization. Mortality, morbidity and disability in Adolescent. What we can learn from mortality data? Maternal, newborn, child and adolescent health, Data, statistics and epidemiology. Geneva: WHO; 2015. Available at: <http://apps.who.int/adolescent/second-decade/section3/page2/mortality.html>. Accessed 12 Nov 2015

## Acronyms

AU	African Union
AUDA	African Union Development Agency/NEPAD
CEN-SAD	Community of Sahel-Saharan States
CLEAR-AA	Centre for Learning on Evaluation and Results – Anglophone Africa
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
GAIN	Global Alliance for Improved Nutrition
IFAD	International Fund for Agricultural Development
LDC	Least developed country
LIC	Low-income country
MIC	Middle-income country
RBD	Regional Bureau: Dakar
RBJ	Regional Bureau: Johannesburg
RBN	Regional Bureau: Nairobi
SAMS	Smallholder Agriculture Market Support
SDG	Sustainable Development Goal(s)
SHN	School health and nutrition
SMD	Standardised Mean Difference
THR	T ake-home rations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
WFP	World Food Programme
WHO	World Health Organization

## Annex A: Methodology

This annex sets out the common methodology used for the systematic review for the three regional studies.

### Search strategy

We conducted literature search in key academic and grey literature sources listed below:

- Academic databases:
- African Index Medicus
- Campbell Collaboration
- Cumulative Index to Nursing and Health Allied Literature (CINHAL)
- DOPHER
- EMBASE
- JBI collaboration
- PubMed via Ovid Medline
- Scopus
- The Cochrane Library
- Trial registers (e.g. Pan African Clinical Trials Registry, Cynical Trials.gov, WHO clinic trials)
- Web of Science
- Google Scholar (additional resources).

### Grey and non-academic literature sources

- Government health departments or ministries
- Government education departments or ministries
- Government departments or ministries responsible for social protection/development
- Sub-national government entities responsible for health, welfare, nutrition
- National school feeding/food/meals programmes and agencies
- National and local non-governmental organizations
- International non-governmental organizations
- Private foundations and philanthropic organizations
- Bilateral and multilateral organizations or agencies (for example: FAO, IFAD, UNDP, UNICEF, WFP, WHO, World Bank, UK AID/DFID, USAID, OECD)
- Continental and regional institutions: African Union Commission, and African Union Development Agency, UN Economic Commission for Africa, ECOWAS, East African Community, SADC, African Development Bank.

### Supplementary searches

We conducted further supplementary searches as follows:

- Checked all the reference list of the included studies (backward chasing), and citation follow up (forward chasing) with the aim of identifying additional papers/reports that may have been missed by the database and grey literature searches.
- We consulted the WFP regional offices focal persons to help us identify any policy documents and other relevant reports in their possessing.

### **Inclusion/exclusion criteria**

The studies were included in the review if they met the following criteria:

- Focus on school-aged children and adolescents (5-19 years) in West Africa
- Studies that assessed one or more of our focused school-based interventions: school feeding and/or supplementation, health education and deworming
- We considered studies that attempt to explain why these interventions worked or failed to work.

Outcomes of interest were categorised as:

- Level 1: nutritional outcomes (stunting, thinness, overweight and obesity, nutrient and energy intake, nutrition knowledge and dietary diversity)
- Level 2: health outcomes (haemoglobin level or prevalence of anaemia, prevalence of parasitic infection such as hookworm, malaria, etc.) We also captured other health outcomes if the studies reported them.
- Level 3: educational outcomes (for example, school enrolment, and attendance, retention and academic performance/completion rate). Studies published between January 2010 and November 30, 2020.

### **Study selection for inclusion**

As one regional consultant was expected to conduct study selection for each region, one reviewer conducted the selection for inclusion using the pre-defined inclusion criteria described above. The selection was however conducted twice to eliminate any selection bias. First, the reviewer screened all the titles, followed by the abstracts and full texts of the potentially qualified titles and abstract. This was done after removal of any duplicate studies/reports.

### **Data collection and analysis**

We extracted both qualitative textual and quantitative statistical data from only the included studies using a data extraction form. Following the data extraction, a narrative synthesis of the data was performed with a tabulation of the results (see appendix for complete data extraction tables). We had planned to conduct a meta-analysis of the statistical data to estimate the pull effect of each nutrition intervention. However, following the completion of the data extraction it was not possible to perform this analysis because of the heterogeneity of the included studies - the data reported were not always similar, and there were several missing important statistical information for intervention and control groups, making it difficult for a meta-analysis to be performed. Therefore, we extracted the quantitative data that were reported in the studies, and use it to support the qualitative narrative synthesis of the findings.

### **Quality assessment of included studies**

Ideally, for any systematic review, a quality of risk bias assessment of the included studies need to be carried out using an appropriate quality assessment/risk of bias tool, and the aim is to evaluate the methodological quality and the strength of the evidence (Booth et al, 2016). However, in this review we took a decision, in consultation with the commissioners of the review, not to do a quality assessment of the studies due to time constraints.



Figure 9a-b: PRISMA flow diagram illustrating selection of school nutrition and deworming studies

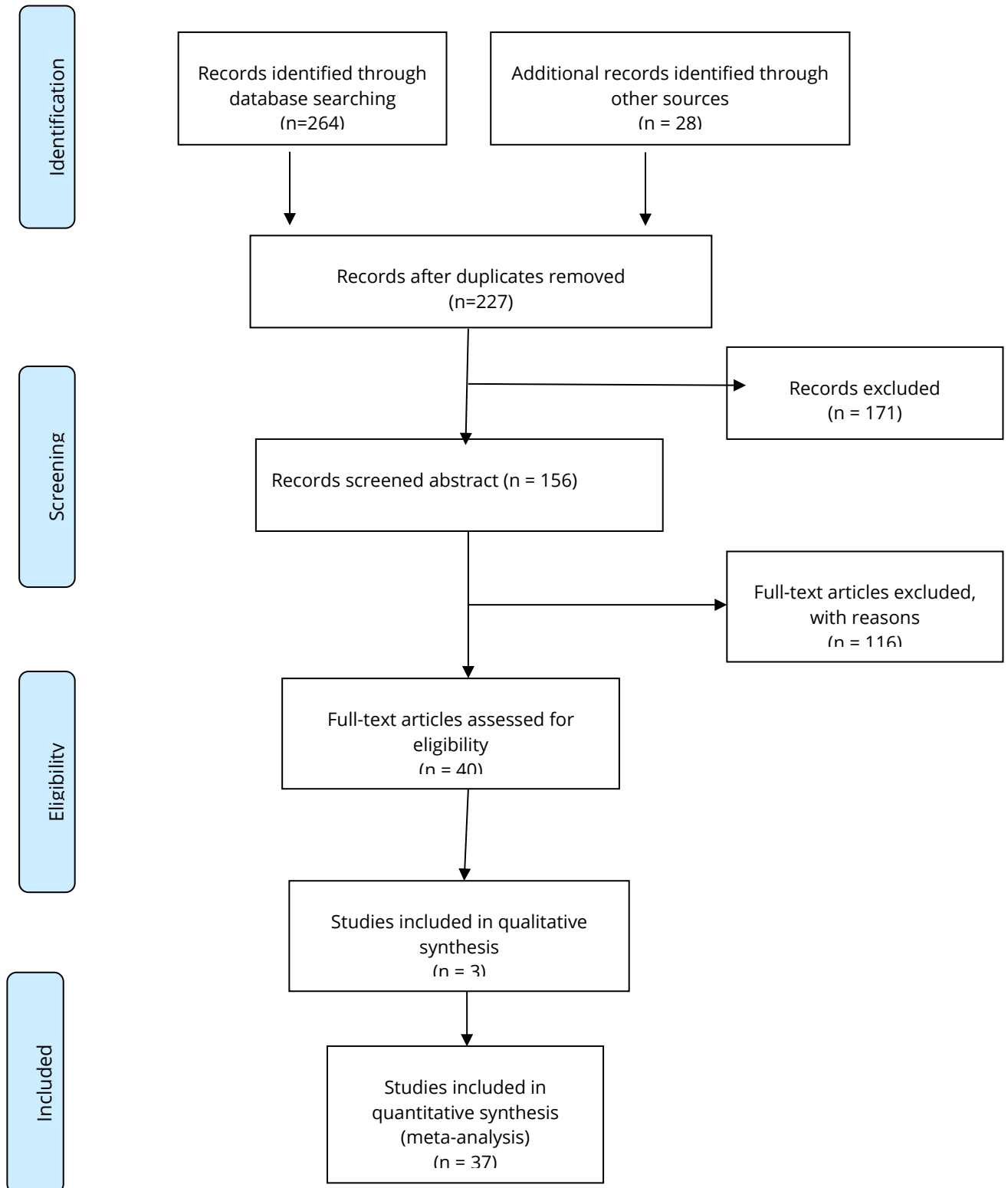


Figure 9b: PRISMA flow diagram illustrating selection of HIV and WASH studies

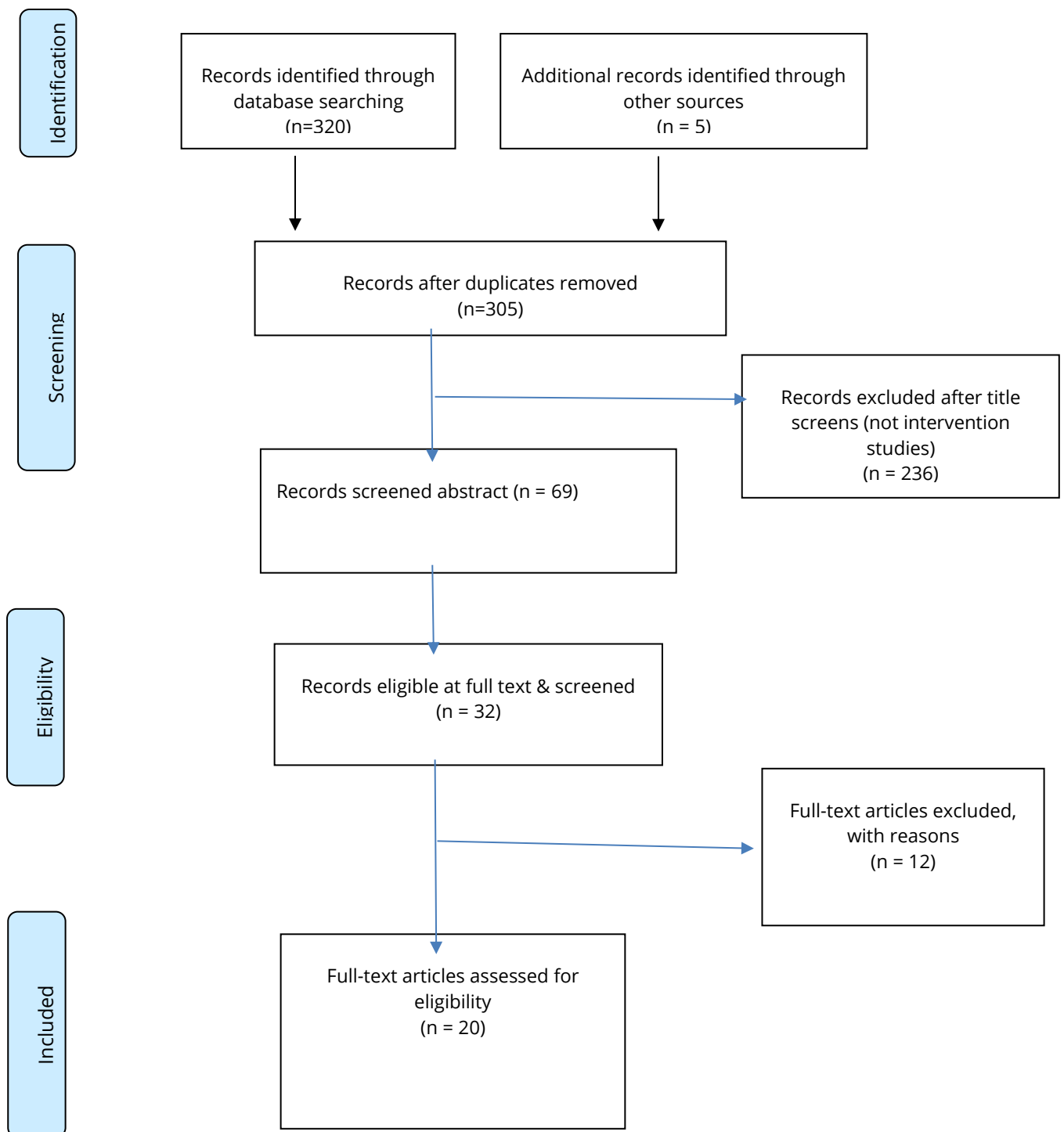


Figure 9c: PRISMA flow diagram illustrating selection of WASH studies

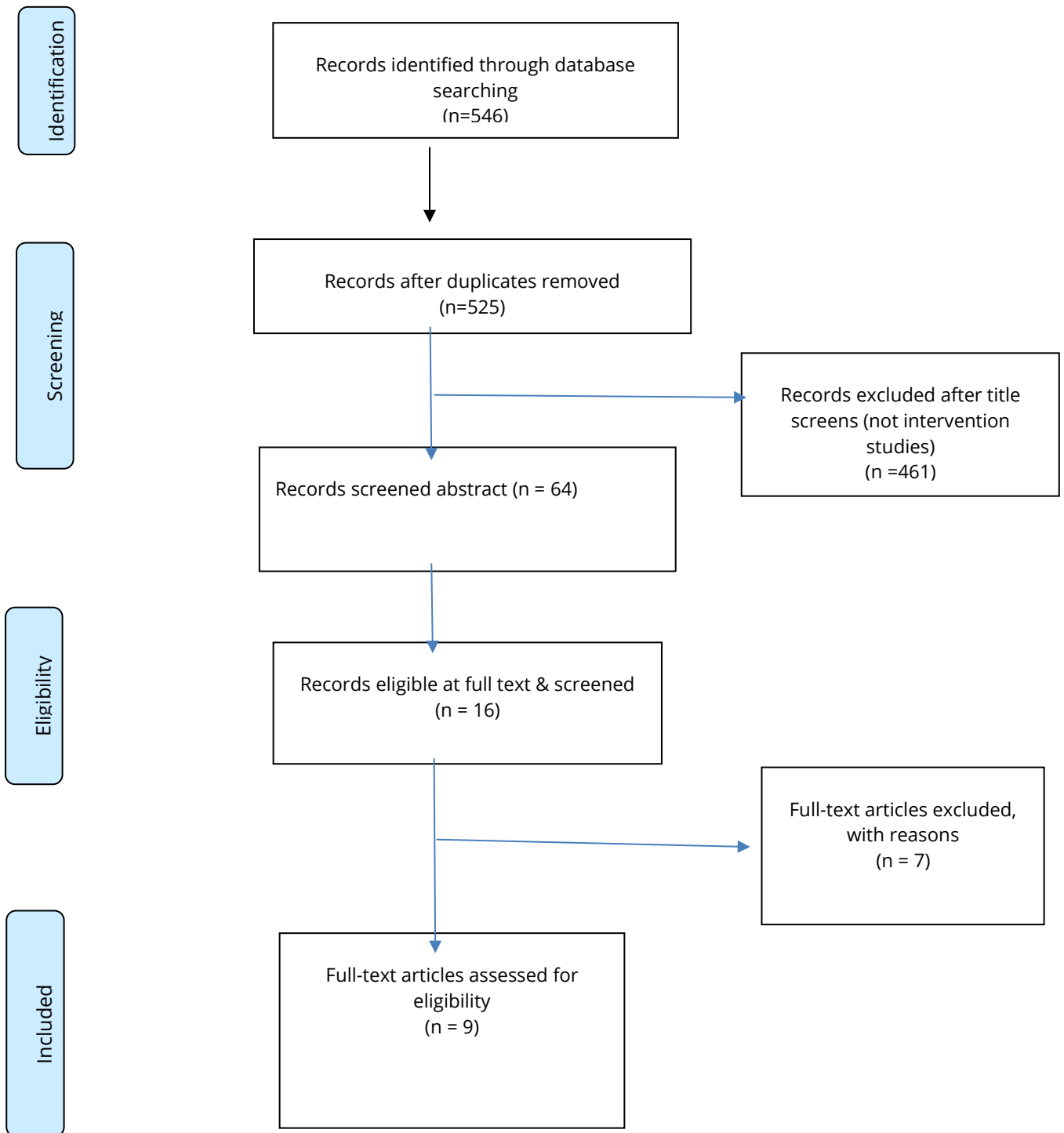


Table 9: School nutrition search strategy

<p>1</p>	<p>((((((((((((((((((((((("School feeding"[Title] OR (Meals[MeSH Terms])) OR (meal*[Title])) OR (Lunch[MeSH Terms])) OR (Lunch[Title])) OR (Breakfast[MeSH Terms])) OR (breakfast[Title])) OR (snacks[MeSH Terms])) OR (snack*[Title])) OR (menu[Title])) OR (Food Assistance[MeSH Terms])) OR (Food Assistance[Title])) OR (stamp[Title])) OR (voucher[Title])) OR (gardens[MeSH Terms])) OR (garden[Title])) OR (food[MeSH Terms])) OR (food[Title/Abstract])) OR (Beverages[MeSH Terms])) OR (Beverages[Title]) AND (y_10[Filter]) AND (y_10[Filter]) AND (y_10[Filter])) AND (((("Child"[Mesh]) OR "Adolescent"[Mesh])) OR (Child[tiab] OR Children[tiab] OR Schoolchildren[tiab] OR Kids[tiab] OR Kid[tiab] OR teen*[tiab] OR adolescen*[tiab] OR Preteen*[tiab])) AND (((("Child"[Mesh]) OR "Adolescent"[Mesh])) OR (Child[tiab] OR Children[tiab] OR Schoolchildren[tiab] OR Kids[tiab] OR Kid[tiab] OR teen*[tiab] OR adolescen*[tiab] OR Preteen*[tiab])) AND (((("Nutritional Status"[Mesh]) OR ("Health Status"[Mesh])) OR (Stunting [tiab] OR wasting[tiab] OR "under nutrition"[tiab] OR "under nutrition"[tiab] OR Thinness[MeSH] OR Overweight[MeSH] OR Obesity[MeSH])) AND ((Africa South of the Sahara[MeSH Terms]) OR (Angola*[tiab] OR Botswana*[tiab] OR Burkina Faso[tiab] OR Burundi*[tiab] OR Cabo Verd*[tiab] OR Cape Verd*[tiab] OR Cameroon*[tiab] OR Central African*[tiab] OR Chad*[tiab] OR Comoros[tiab] OR Congo[tiab] OR Cote d'Ivoire[tiab] OR Ivory Coast[tiab] OR Djibouti[tiab] OR Eritrea*[tiab] OR Ethiopia*[tiab] OR Gabon*[tiab] OR Gambia*[tiab] OR Ghana*[tiab] OR Guinea*[tiab] OR Kenya*[tiab] OR Madagascar*[tiab] OR Malawi*[tiab] OR Mauritania*[tiab] OR Mauriti*[tiab] OR Mozambique[tiab] OR Namibia*[tiab] OR Niger*[tiab] OR Rwanda*[tiab] OR Sao Tome[tiab] OR Principe[tiab] OR Senegal*[tiab] OR Sierra Leone*[tiab] OR Somalia*[tiab] OR South Africa*[tiab] OR Sudan*[tiab] OR Tanzania*[tiab] OR Uganda*[tiab] OR Benin*[tiab] OR Guinea-Bissau*[tiab] OR Lesotho*[tiab] OR Liberia*[tiab] OR Madagascar*[tiab] OR Mali*[tiab], Nigeria*[tiab] OR Togo*[tiab] OR Uganda*[tiab] OR Zaire*[tiab] OR Zambia*[tiab] OR Zimbabwe*[tiab])) AND (y_10[Filter]))</p>
<p>2</p>	<p>((((((("School feeding"[Title/Abstract]) OR ("School lunch"[Title/Abstract])) OR ("School meal"[Title/Abstract])) OR ("Food assistance"[Title/Abstract])) OR (voucher[Title/Abstract])) OR (stamp[Title/Abstract])) AND (((((((("Child"[Mesh]) OR "Adolescent"[Mesh])) OR (Child[tiab] OR Children[tiab] OR Schoolchildren[tiab] OR Kids[tiab] OR Kid[tiab] OR teen*[tiab] OR adolescen*[tiab] OR Preteen*[tiab])) AND (((("Child"[Mesh]) OR "Adolescent"[Mesh])) OR (Child[tiab] OR Children[tiab] OR Schoolchildren[tiab] OR Kids[tiab] OR Kid[tiab] OR teen*[tiab] OR adolescen*[tiab] OR Preteen*[tiab])) AND (((("Nutritional Status"[Mesh]) OR ("Health Status"[Mesh])) OR (Stunting [tiab] OR wasting[tiab] OR "under nutrition"[tiab] OR "under nutrition"[tiab] OR Thinness[MeSH] OR Overweight[MeSH] OR Obesity[MeSH])) AND ((Africa South of the Sahara[MeSH Terms]) OR (Angola*[tiab] OR Botswana*[tiab] OR Burkina Faso[tiab] OR Burundi*[tiab] OR Cabo Verd*[tiab] OR Cape Verd*[tiab] OR Cameroon*[tiab] OR Central African*[tiab] OR Chad*[tiab] OR Comoros[tiab] OR Congo[tiab] OR</p>

	<p>Cote d'Ivoire[tiab] OR Ivory Coast[tiab] OR Djibouti[tiab] OR Eritrea*[tiab] OR Ethiopia*[tiab] OR Gabon*[tiab] OR Gambia*[tiab] OR Ghana*[tiab] OR Guinea*[tiab] OR Kenya*[tiab] OR Madagascar*[tiab] OR Malawi*[tiab] OR Mauritania*[tiab] OR Mauriti*[tiab] OR Mozambique[tiab] OR Namibia*[tiab] OR Niger*[tiab] OR Rwanda*[tiab] OR Sao Tome[tiab] OR Principe[tiab] OR Senegal*[tiab] OR Sierra Leone*[tiab] OR Somalia*[tiab] OR South Africa*[tiab] OR Sudan*[tiab] OR Tanzania*[tiab] OR Uganda*[tiab] OR Benin*[tiab] OR Guinea-Bissau*[tiab] OR Lesotho*[tiab] OR Liberia*[tiab] OR Madagascar*[tiab] OR Mali*[tiab], Nigeria*[tiab] OR Togo*[tiab] OR Uganda*[tiab] OR Zaire*[tiab] OR Zambia*[tiab] OR Zimbabwe*[tiab])) AND (y_10[Filter]))</p>
3	<p>Search: (((((((((((((((((((((((("School feeding"[Title) OR (Meals[MeSH Terms])) OR (meal*[Title])) OR (Lunch[MeSH Terms])) OR (Lunch[Title])) OR (Breakfast[MeSH Terms])) OR (breakfast[Title])) OR (snacks[MeSH Terms])) OR (snack*[Title])) OR (menu[Title])) OR (Food Assistance[MeSH Terms])) OR (Food Assistance[Title])) OR (stamp[Title])) OR (voucher[Title])) OR (gardens[MeSH Terms])) OR (garden[Title])) OR (food[MeSH Terms])) OR (food[Title/Abstract])) OR (Beverages[MeSH Terms])) OR (Beverages[Title]) AND (y_10[Filter]) AND (y_10[Filter]) AND (y_10[Filter])) AND (((("Child"[Mesh]) OR "Adolescent"[Mesh])) OR (Child[tiab] OR Children[tiab] OR Schoolchildren[tiab] OR Kids[tiab] OR Kid[tiab] OR teen*[tiab] OR adolescen*[tiab] OR Preteen*[tiab])) AND (((("Child"[Mesh]) OR "Adolescent"[Mesh])) OR (Child[tiab] OR Children[tiab] OR Schoolchildren[tiab] OR Kids[tiab] OR Kid[tiab] OR teen*[tiab] OR adolescen*[tiab] OR Preteen*[tiab])) AND (((("Nutritional Status"[Mesh]) OR ("Health Status"[Mesh])) OR (Stunting [tiab] OR wasting[tiab] OR "under nutrition"[tiab] OR "under nutrition"[tiab] OR Thinness[MeSH] OR Overweight[MeSH] OR Obesity[MeSH]))) AND ((Africa South of the Sahara[MeSH Terms]) OR (Angola*[tiab] OR Botswana*[tiab] OR Burkina Faso[tiab] OR Burundi*[tiab] OR Cabo Verd*[tiab] OR Cape Verd*[tiab] OR Cameroon*[tiab] OR Central African*[tiab] OR Chad*[tiab] OR Comoros[tiab] OR Congo[tiab] OR Cote d'Ivoire[tiab] OR Ivory Coast[tiab] OR Djibouti[tiab] OR Eritrea*[tiab] OR Ethiopia*[tiab] OR Gabon*[tiab] OR Gambia*[tiab] OR Ghana*[tiab] OR Guinea*[tiab] OR Kenya*[tiab] OR Madagascar*[tiab] OR Malawi*[tiab] OR Mauritania*[tiab] OR Mauriti*[tiab] OR Mozambique[tiab] OR Namibia*[tiab] OR Niger*[tiab] OR Rwanda*[tiab] OR Sao Tome[tiab] OR Principe[tiab] OR Senegal*[tiab] OR Sierra Leone*[tiab] OR Somalia*[tiab] OR South Africa*[tiab] OR Sudan*[tiab] OR Tanzania*[tiab] OR Uganda*[tiab] OR Benin*[tiab] OR Guinea-Bissau*[tiab] OR Lesotho*[tiab] OR Liberia*[tiab] OR Madagascar*[tiab] OR Mali*[tiab], Nigeria*[tiab] OR Togo*[tiab] OR Uganda*[tiab] OR Zaire*[tiab] OR Zambia*[tiab] OR Zimbabwe*[tiab])) AND (y_10[Filter])) AND (y_10[Filter])) AND (Schools[MeSH Terms]) Filters: in the last 10 years</p>

Table 10: Google Scholar search strategy

<p><b>Examples</b></p>
<ul style="list-style-type: none"> <li>allintitle: Ghana "school based nutrition education"</li> </ul>

<ul style="list-style-type: none"> <li>• allintitle: Ghana "mebendazole OR albendazole OR deworming OR Praziquantel "school based "</li> <li>• allintitle: Ghana "supplement OR supplementation OR micronutrient OR nutrient "school based"</li> </ul>
<ul style="list-style-type: none"> <li>• allintitle: Nigeria, "school based nutrition education"</li> <li>• allintitle: Nigeria "mebendazole OR albendazole OR deworming OR Praziquantel "school based "</li> <li>• allintitle: Nigeria "supplement OR supplementation OR micronutrient OR nutrient "school based"</li> </ul>
<ul style="list-style-type: none"> <li>• allintitle: Kenya, "school based nutrition education"</li> <li>• allintitle: Kenya "mebendazole OR albendazole OR deworming OR Praziquantel "school based "</li> <li>• allintitle: Kenya "supplement OR supplementation OR micronutrient OR nutrient "school based"</li> </ul>
<ul style="list-style-type: none"> <li>• allintitle: South Africa, "school based nutrition education"</li> <li>• allintitle: South Africa "mebendazole OR albendazole OR deworming OR Praziquantel "school based "</li> <li>• allintitle: South Africa "supplement OR supplementation OR micronutrient OR nutrient "school based"</li> </ul>

Table 11: Policy documents search strategy

<p>((Policy[MeSH Terms]) AND ((((((School feeding"[Title/Abstract]) OR ("School lunch"[Title/Abstract])) OR ("School meal"[Title/Abstract])) OR ("Food assistance"[Title/Abstract])) OR (voucher[Title/Abstract])) OR (stamp[Title/Abstract]))) AND ((Africa South of the Sahara[MeSH Terms]) OR (Angola*[tiab] OR Botswana*[tiab] OR Burkina Faso[tiab] OR Burundi*[tiab] OR Cabo Verd*[tiab] OR Cape Verd*[tiab] OR Cameroon*[tiab] OR Central African*[tiab] OR Chad*[tiab] OR Comoros[tiab] OR Congo[tiab] OR Cote d'Ivoire[tiab] OR Ivory Coast[tiab] OR Djibouti[tiab] OR Eritrea*[tiab] OR Ethiopia*[tiab] OR Gabon*[tiab] OR Gambia*[tiab] OR Ghana*[tiab] OR Guinea*[tiab] OR Kenya*[tiab] OR Madagascar*[tiab] OR Malawi*[tiab] OR Mauritania*[tiab] OR Mauriti*[tiab] OR Mozambique[tiab] OR Namibia*[tiab] OR Niger*[tiab] OR Rwanda*[tiab] OR Sao Tome[tiab] OR Principe[tiab] OR Senegal*[tiab] OR Sierra Leone*[tiab] OR Somalia*[tiab] OR South Africa*[tiab] OR Sudan*[tiab] OR Tanzania*[tiab] OR Uganda*[tiab] OR Benin*[tiab] OR Guinea-Bissau*[tiab] OR Lesotho*[tiab] OR Liberia*[tiab] OR Madagascar*[tiab] OR Mali*[tiab], Nigeria*[tiab] OR Togo*[tiab] OR Uganda*[tiab] OR Zaire*[tiab] OR Zambia*[tiab] OR Zimbabwe*[tiab]))</p>
---

## Annex B: School feeding programmes in West Africa region

Main source of information: African Union (2018). African Union Study on Sustainable School Feeding in Member States, FAO (2018). Regional overview of national school food and nutrition programmes in Africa, and WFP Annual Country Programme Reports available at <https://www.wfp.org/annual-country-reports-2019>. The African Union study and the FAO study included a survey of African countries on details of their school feeding programmes. The data from these surveys and the WFP Annual Country Reports pre-date the COVID-19 pandemic.

Table 12. Context 1: Crisis or humanitarian settings

<b>Context 1: Crisis or humanitarian settings</b>									
	<b>Primary SFP; year started; SFP part of national policies</b>	<b>Actors involved in implementation</b>	<b>Multiple SFP models?</b>	<b>Targeting</b>	<b>Beneficiaries and/or coverage (% of school children)</b>	<b>Meals</b>	<b>Complementary interventions</b>	<b>Primary funders</b>	<b>Food sources and procurement</b>
Burkina Faso	Support to primary school teaching  Part of national policies	Ministry of Education, WFP, Catholic Relief Services	WFP serves breakfast and THR for girls. Government serves lunch. NGO serves lunch	Geographic. Schools with adequate and safe storage facilities, space for cooking	78,565 children 79.83 percent Preschool and primary school	In-school meals (breakfast and lunch). THR for girls in last two primary school classes	None	WFP, Government	Mostly from abroad. Cereals procured locally from farming cooperatives, yogurt from women's groups. Procurement centralised – WFP purchases through country offices and delivers through sub-offices
Cameroon	Support to primary education	Ministry of Basic Education, Ministry of Agriculture, WFP, FAO	No	Geographic – regions in north and extreme north with	19,459 children Primary school, grades 1-6	In-school meals with THR. Meals served at noon	None	WFP	Equal sourcing domestically and abroad.

Review of school-based health and nutrition interventions in West Africa region

	Not part of national policies			high food insecurity and disparities in enrolment rates for girls and boys					Procurement centralised through WFP
Central African Republic	School feeding in place provided by WFP.	WFP, Ministry of Education, UNICEF (deworming)	Not known	Not known	Not known	Hot meals to school children	Deworming	WFP	Not known
Chad	Support to primary education and girls' enrolment, 1973 Not part of national policies	National Directorate of Food, Nutrition and School Health under National Ministry of Education and Civic Promotion; WFP	Not known	Geographic – regions with high levels of food insecurity and low school enrolment rates	128,000 children 9.58 percent  Primary school	In-school meals and THR. Meals served between 09:00 and 10:00	Deworming and micronutrient fortification	WFP	Sourced mostly abroad Procurement centralised through WFP
Gambia	Home Grown School Feeding Programme, 2012 Part of national policies	Ministry of Basic Education, Ministry of Agriculture, Gambia Standards Bureau, WFP, FAO	No	Geographic – areas vulnerable to food insecurity and low education outcomes	126,513 children 26.13 percent  ECD centres, primary schools, and Islamic schools	In-school meals. Daily meal served at 11:00	Deworming; health education for school children, teachers and school committees	WFP, Government	Sourced mostly abroad. Procurement mainly centralised but decentralised procurement through community procurement and caterer model piloted in 24 schools



Review of school-based health and nutrition interventions in West Africa region

Guinea (source: WFP Guinea 2019 Annual Country Report)	School Feeding Programme  Part of national policies	WFP, Ministry of Education, National Directorate of School Feeding  Collaborate with FAO for agricultural inputs (rice) and UNDP for cooking stoves	Not known	Regions most food insecure (five regions)	124,380 children 94 percent of targeted children reached	In-school meals: Daily hot meal  Quarterly THR for girls	Specialised nutritious food in addition to hot meals for children in areas most affected by global acute malnutrition	WFP	Sourced abroad and locally. Cash transfers to selected school management committees for local purchases from smallholders and retailers
Guinea-Bissau (source: WFP 2019 Annual Country Report)	School Feeding Programme (circa 2000)  School Feeding Law (2019)	WFP, Ministry of Education	Decision in 2017 to implement Home Grown School Feeding	Not known	Monthly average 179,042 children attending 865 schools	In-school meals: Hot meals  THR for girls' grade 4-6	Training management committees, improved cooking stoves	WFP and Government	Procurement centralised. Cash-based transfers to canteens in 195 schools to purchase locally produced vegetables and tubers to complement WFP daily ration
Liberia	Liberia School Feeding Program, 1968  Part of national policies	Ministry of Education, WFP, Mary's Meals (NGO), Ministry of Agriculture, Ministry of Health, Ministry of Finance	1. Daily hot meals in public and community primary schools, WFP monthly THR for girls; 2. Daily hot meals in public and community and private schools	Categorical - Targeting based on Food Security and Vulnerability Assessment.	438,444 children  Kindergarten and grades 1-6 (WFP); Kindergarten and grades 1-12 (Mary's Meals)	In-school meals and THR: Daily meals served between 10:00 and 11:00  THR for girls in grades 4-6	Deworming; school gardens; energy efficient stoves; trainings on nutrition, health, sanitation; capacity strengthening for government	WFP, private donations	Sourced mainly abroad  Decentralised procurement, no procurement guidelines. WFP supports procurement at school level

Review of school-based health and nutrition interventions in West Africa region

			under Mary's Meals						
Mali	<p>Providing safety nets to students in conflict zones, 2015</p> <p>Part of national policies</p>	WFP, Ministry of Education, National Centre for Canteens Scoiaires	<p>1) WFP directly transports commodities to schools or sends cash through financial institutions; 2) Government provides cash to the Committee on School Management (CGS) through mayors; 3) CRS gives food to schools</p>	Geographic - Northern Region targeted	109,334 children Grades 1-6	In-school meals: served daily between 12:00 and 13:00	Vitamin enriched oil and iodised salt	Ministry of Education	<p>Equal domestic and sources abroad</p> <p>Centralised - WFP contracts local transporters which deliver commodities to each school quarterly. These commodities are received by members of the CGS, who oversee storage, food rations and preparation</p>
Mauritania	School feeding	WFP and Ministry of Education	Not known	Target areas most	47,470 primary	In school meals: Daily	In-school communication	WFP	Centralised procurement

Review of school-based health and nutrition interventions in West Africa region

(source: WFP Mauritania 2019 Annual Country Report)	programme in place			affected by high prevalence of food insecurity and malnutrition, and low school attendance rates	school children	morning snacks and hot lunches	on nutrition, hygiene and family practices		through WFP. Some local products purchased by local communities to complement WFP meals
Niger	Government School Feeding Program with WFP support, 1975  Part of national policies	WFP and Ministry of Primary Education	1) Canteens supported exclusively by the government; 2) Canteens supported by WFP	Geographic and categorical - Rural areas with nomadic populations, food insecurity and low girls attendance rate.	248,408 children 10.4 percent Primary school	In-school meals: 2-3 daily meals served before 8AM for breakfast, 12.30PM for lunch and at sundown for dinner in nomadic zones.	School gardens; livestock transfers to high-performing girl students	WFP	Domestic sources Centralised - Tenders with smallholder organisations, prices determined by the VAM (Vulnerability Assessment Mapping) on the basis of a market analysis
Sierra Leone	National School Feeding Program, 2016  In Education Sector Policy	School Feeding Secretariat under Ministry of Education, Science and Technology, CRS	1) Government implements National School Feeding Program and provides funds to school authorities to locally buy	Not known	653,582 children 95.11 percent  Primary school, grades 1-6	In-school meals: Meal served mid-day, twice per week under National School Feeding Programme; morning porridge	Provision of storage facilities; teacher training (CRS model)	Ministry of Finance and Economic Development	Domestic sources Decentralised - School authorities work with community-based groups (5-man committees/SMCs) to buy food from the local market.

Review of school-based health and nutrition interventions in West Africa region

			food; 2) CRS provides a morning snack to learners in one district.			served daily under CRS model.			
--	--	--	--	--	--	-------------------------------	--	--	--

Table 13. Context 2: Stable low-income or lower middle-income countries

<b>Context 2: Stable low-income or lower middle-income countries</b>									
	<b>Primary SFP; year started; SFP part of national policies</b>	<b>Actors involved in implementation</b>	<b>Multiple SFP models</b>	<b>Targeting approach</b>	<b>Beneficiaries and/or coverage (% of school children)</b>	<b>Meals</b>	<b>Complementary interventions</b>	<b>Primary funders</b>	<b>Food sources and procurement</b>
Benin (source: WFP Benin 2019 Annual Country Report)	Integrated National Programme of School Feeding (PNASI)  Part of national policies	WFP implements on behalf of Government. Ministry of Maternal and Primary Education, decentralized regional agencies, Directorate of School Feeding, Ministry of Planning and Development, local NGOs (to assist WFP)	No	Communities throughout the country facing food insecurity and low school enrolment rates	629,832 children  Cover 51 percent of public primary schools in Benin	In school: Hot meals	Education in basic health, nutrition matters and hygiene. Set up and training for school canteen management committees, building of canteen kitchens and handwashing equipment, promotion of school gardens	WFP and Government	WFP food basket complemented by fresh vegetables, fish or meat provided by school communities
Cote d'Ivoire	School feeding	WFP and Ministry of Education,	Includes Home Grown	Target the most	122,289 children	In-school meals: Daily	Nutrition and hygiene	WFP and Government	Additional domestic

Review of school-based health and nutrition interventions in West Africa region

(source: WFP 2019 Annual Country Report)	programme in place Part of national policies	Directorate of School Canteens	School Feeding component	vulnerable regions	Targeted 613 public primary schools, achieved 98 percent coverage	nutritious meal Quarterly THR for girls in grades 5 and 6	awareness for school children, various trainings for school management committees, canteen cooks, etc.		sources through voluntary contributions of communities and purchases from smallholder producers in school areas
Senegal	Support to School Feeding, 1975  Part of national policies	Division of School Feeding (DCaS) under Ministry of Education (MEN), WFP, Care Plan International	1) WFP model (covering 181 canteens); 2) Government model; 3) Care Plan International in Saint Louis region. All actors utilise same targeting system to identify schools.	Not known	89,738 children 17.54 percent	In-school meals: Daily meal served at 1PM.	Deworming; nutritional education	WFP	Domestic sources Centralised - WFP contracts producer unions to collect rice production from their members and deliver it to their respective producers' union, from where WFP carries out its procurement.

Table 14: Context 3: Middle-income countries/countries with nationally owned school feeding programmes

<b>Context 3: Middle-income countries/countries with nationally owned school feeding programmes</b>									
	<b>Primary SFP; year started; SFP part of</b>	<b>Actors involved in implementation</b>	<b>Multiple SFP models</b>	<b>Targeting</b>	<b>Beneficiaries and/or coverage (% of children)</b>	<b>Meals</b>	<b>Complementary interventions</b>	<b>Primary funders</b>	<b>Food sources and procurement</b>

Review of school-based health and nutrition interventions in West Africa region

	<b>national policies</b>								
<b>Ghana</b>	Ghana School Feeding Programme, 2005 Part of national policies	Ministries of Gender, Children and Social Protection; Education; Health; Agriculture, Local Government and Rural Development; WFP. UNICEF; PCD; World Bank	No	Not known	1.7 million children 41.4% Kindergarten and primary school grades 1-6	In school meals: Daily meal served late morning	Micronutrient supplementation; deworming; trainings on nutrition, health and sanitation	Ministry of Finance	Domestic sources Decentralised procurement – public tender issued by School Feeding Secretariat to select vendor to procure goods in bulk and supply to caterers. Also caterers may purchase from local smallholder farmers
<b>Nigeria</b>	National Home Grown School Meals Program	Ministries of Education, Health, Justice, Agriculture, Budget and Planning Coordinated through National School Feeding Coordinating Team	Not known	Not known	HGSF: Over 1 million children in 4 states in 8567 schools (2016) Aim to feed 5.5 million children School feeding in 7 states overall	In school meals: one meal per day	Capacity building workshops, Training of cooks	Federal Government funds primary grades 1 to 3 State governments fund grades 2 to 6	Domestic smallholder farmers to be main source
<b>Sao Tome &amp; Principe</b> (source: WFP Sao)	National School Feeding and Health	Government, with WFP support	Home Grown School Feeding	All public primary schools	About 50,000 children	In school meals	Capacity building workshops, Training of cooks	Government and WFP	Not known

Review of school-based health and nutrition interventions in West Africa region

<b>Tome &amp; Principe 2019 Annual Country Report)</b>	Programme (PNASE) Part of national policies								
<b>Togo (source: WFP Togo 2019 Annual Country Report)</b>	National school feeding programme,  School feeding law passed in 2020	Ministry of Grassroots Development (lead) with Ministries of Rural Development, Education, Health, Finance (WFP capacity building)	Community-based school feeding. Piloting Home Grown School Feeding	All public primary schools	91,000 children attending 314 public primary schools	In-school meals: Hot meals	School gardens	Government, donors	Domestic sources (local producers and school gardens)

## Annex C: Stakeholders: WFP West Africa Region

(Countries in bold are covered by WFP Bureau Dakar)

Table 15. Stakeholders involved in School Health and nutrition promotion: WFP West Africa Region

Name of organization	Countries covered/Member countries	Stakeholder category	Position on school health and nutrition	Sources of information
<b>FAO Africa Regional Conference (ARC)</b>	All Sub-Saharan Africa excluding Sudan	United Nations entity	ARC's role is to provide guidance on priorities for FAO's work in the Africa region. And is an important platform for advocacy on food security and nutrition. Ending Hunger is one of FAO's Regional Initiatives supported by ARC. The Regional Initiative focuses on strengthening capacities of regional and national institutions in policies, planning, measurement, governance etc. of food security and nutrition. A second Regional Initiative that focuses on value chains includes nutrition-sensitive value chains, briefly mentions school gardens. The third Regional Initiative focuses on building resilience in areas affected by climate change and conflict (working with WFP).	<a href="http://www.fao.org/3/nc610en/nc610en.pdf">http://www.fao.org/3/nc610en/nc610en.pdf</a>
<b>FAO Sub-regional office for West Africa (Dakar)</b>	Supports 15 ECOWAS Member States	United Nations entity	The Sub-Regional Office provides technical support to FAO Country Offices in supporting governments with policies and strategies to improve the food security and nutrition, in line with FAO Africa Regional Initiative of Ending Hunger. The <b>FAO School Food and Nutrition Framework (2019)</b> is informed by recommendations adopted at the Second International Conference on Nutrition (ICN2). The framework seeks to guide FAO's support to countries in leveraging synergies presented by schools as platforms for a holistic approach to raising levels of nutrition, reducing poverty, and enabling inclusive food systems. These synergies are aimed at benefiting children and adolescents' diets, nutrition and well-being, as well as the school's and community's development and empowerment. FAO is one of the contributors to the <b>Home Grown School Feeding Framework</b> , and is expected to collaborate with WFP and IFAD and other stakeholders in supporting governments to design and implement Home Grown School Feeding. The FAO West Africa Sub-regional office also collaborates with	<a href="http://www.fao.org/africa/west-africa/en/">http://www.fao.org/africa/west-africa/en/</a>



Review of school-based health and nutrition interventions in West Africa region

			WFP, other UN agencies and partners in food crises and emergencies in West Africa and the Sahel.	
<b>FAO Sub-regional office for Central Africa (Libreville, Gabon)</b>	Supports <b>Cameroon, Central African Republic, Chad, Congo, DR Congo, Equatorial Guinea, Gabon, Sao Tome and Principe</b>	United Nations entity	Focuses on economic diversification policy and reform. No specific information on school feeding.	<a href="http://www.fao.org/africa/central-africa/en/">http://www.fao.org/africa/central-africa/en/</a>
<b>IFAD Western &amp; Central Africa grouping</b>	<b>Benin, Burkina Faso, Cabo Verde, Cameroun, Central African Republic, Chad, Congo, Cote d'Ivoire, DR Congo, Equatorial Guinea, Gabon, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sao Tome &amp; Principe, Senegal, Sierra Leone, Togo</b>	United Nations entity	No information available on school health and nutrition. There is potential for IFAD participation in Home Grown School Feeding as it supports smallholder farmers in production, helping farmers to produce more and sell more nutritious food, thus increasing their income and food security.	<a href="https://www.ifad.org/en/web/operations/regions/wca">https://www.ifad.org/en/web/operations/regions/wca</a>
<b>UNECA sub-regional office for West Africa (Niamey, Niger)</b>	Supports member countries of ECOWAS	United Nations entity	Provides Member States and regional economic communities with capacity building and advisory services to assist structural transformation of economies and economic integration of West Africa; capacity building for planning, monitoring and evaluation. Collaboration with ECOWAS on impact assessment of COVID-19, including impact on food security. No information on position on school health and nutrition.	<a href="https://www.uneca.org/west-africa">https://www.uneca.org/west-africa</a>

Review of school-based health and nutrition interventions in West Africa region

<p><b>UNICEF West and Central Africa Regional Office</b></p>	<p><b>Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Cote d'Ivoire, DR Congo, Equatorial Guinea, the Gambia, Gabon, Ghana, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome &amp; Principe, Senegal, Sierra Leone, Togo</b></p>	<p>United Nations entity</p>	<p><b>UNICEF's 2019 State of the World's Children report</b> focuses on food and nutrition of children. Key messages include:</p> <ul style="list-style-type: none"> <li>- Investing in nutrition for children and young people is a cornerstone investment if the world is to achieve the Sustainable Development Goals by 2030.</li> <li>- Improving children's nutrition requires food systems to deliver nutritious, safe, affordable and sustainable diets for all children. The report stresses the importance of middle childhood 5-9 years as an opportunity for children who experienced stunting to catch up. Nutrition habits are also established during this period. The report notes data on what school-aged children eat are limited.</li> <li>- Adolescents 10-19 years diets in low and middle-income countries are generally nutritionally poor.</li> </ul> <p>UNICEF' <b>Child Friendly Schools Framework (CFS)</b> promotes a child rights and holistic approach to education that includes the promotion of the physical and emotional health of children by addressing their key nutritional and health care needs and equipping them with knowledge for the future.</p>	<p><a href="https://www.unicef.org/media/60846/file/SO WC-2019-WCA.pdf">https://www.unicef.org/media/60846/file/SO WC-2019-WCA.pdf</a></p>
<p><b>WHO Regional Office for Africa: Inter-country support team: West Africa</b></p>	<p>Covers 17 countries: Algeria, <b>Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo.</b></p>	<p>United Nations entity</p>	<p>WHO Regional Committee for Africa adopted the Strategic Plan to reduce the double burden of malnutrition in the Africa Region: 2019 – 2025 (in August 2019). The strategy aims to reduce all forms malnutrition throughout the life course. Its objectives are to strengthen policies and regulatory frameworks, strengthen national capacity and evidence base for nutrition programming. Its guiding principles include a life-course approach, multi-sectoral collaboration, universal health coverage and partnerships. One of the priorities in the strategic plan is to strengthen multi-sectoral collaboration to prevent malnutrition, and advocates for strong collaboration between health and education sectors for educating school-aged children on nutrition.</p>	<p><a href="https://www.afro.who.int/about-us/organizational-structure">https://www.afro.who.int/about-us/organizational-structure</a></p> <p><a href="https://www.afro.who.int/sites/default/files/2019-08/AFR-RC69-7%20Strategic%20Plan%20to%20reduce%20the%20double%20burden%20of%20malnutrition.pdf">https://www.afro.who.int/sites/default/files/2019-08/AFR-RC69-7%20Strategic%20Plan%20to%20reduce%20the%20double%20burden%20of%20malnutrition.pdf</a></p>

Review of school-based health and nutrition interventions in West Africa region

<p><b>African Union</b></p>	<p>All African countries member states</p>	<p>Continental Intergovernmental Organization</p>	<p>AU adopted the revised <b>Africa Regional Nutrition Strategy 2015-2025</b> that mirrors nutrition targets adopted by African countries at the World Health Assembly in 2011. The AU works with Member States to improve nutrition and knowledge/evidence – for example, the <b>Cost of Hunger in Africa</b> study. The AU strongly supports school feeding. It has the AU School Feeding Initiative where the AU is working with Member States to implement school feeding. The AU commissioned a major study on <b>Sustainable School Feeding in Africa</b> (2018) with support of WFP. The <b>African Day of School Feeding</b> was instituted in January 2016 through AU Decision by African Union Heads of State and Government in recognition of the value of home-grown school feeding.</p>	<p><a href="https://au.int/en/about-au-school-feeding">https://au.int/en/about-au-school-feeding</a></p> <p><a href="https://au.int/en/documents/20181008/sustainable-school-feeding-report">https://au.int/en/documents/20181008/sustainable-school-feeding-report</a></p>
<p><b>AUDA-NEPAD: African Union Development Agency</b></p>	<p>Supports all Member States of the African Union</p>	<p>Implementing agency of the African Union</p>	<p>School feeding is one of NEPAD/AUDA's flagship projects under the Food and Nutrition Programme. Recently published the <b>Home- Grown School Feeding Handbook</b> based on lessons learned from Botswana, Ghana, and Nigeria.</p>	<p><a href="https://www.nepad.org/publication/home-grown-school-feeding-handbook">https://www.nepad.org/publication/home-grown-school-feeding-handbook</a></p>
<p><b>World Bank</b></p>	<p>Covers 22 countries in Western and Central Africa</p>	<p>United Nations entity (Bretton Woods institution)</p>	<p>Reducing all forms of malnutrition is central to WB goals of reducing extreme poverty and increasing prosperity, as well as building resilience and preventing instability. The Bank is concerned about the slower rate of reduction in stunting in Sub-Saharan Africa compared to other regions and sees accelerating the reduction in stunting as key to maximizing return on investments in early childhood development, in education, and more broadly in policies aimed at fostering and enhancing human capital accumulation and job creation. The Bank supports countries to develop investment cases for reducing stunting and other forms of malnutrition. It publishes country nutrition profiles on all Sub-Saharan African countries including those where it is not supporting nutrition-related activities. The Bank also hosts the <b>Global Database on Child Growth and Malnutrition</b> with WHO and UNICEF.</p>	<p><a href="http://documents1.worldbank.org/curated/en/126621505397202676/pdf/119719-WP-ASA-Full-Report-V7-WEB-PUBLIC.pdf">http://documents1.worldbank.org/curated/en/126621505397202676/pdf/119719-WP-ASA-Full-Report-V7-WEB-PUBLIC.pdf</a></p> <p><a href="http://www.worldbank.org">www.worldbank.org</a></p>
<p><b>African Development Bank</b></p>	<p>Continental (Regional) All African states are members.</p>	<p>Development Finance Institution</p>	<p>Overarching objective is to spur sustainable economic development and social progress in Regional Member Countries by mobilizing and allocating resources for investment in RMCs; and providing policy advice and technical assistance to support development efforts. Nutrition forms part of the AfDB Human Capital Development Strategy.</p>	<p><a href="https://www.afdb.org/en/topics-and-sectors/sectors/human-capital-development/nutrition">https://www.afdb.org/en/topics-and-sectors/sectors/human-capital-development/nutrition</a></p>

Review of school-based health and nutrition interventions in West Africa region

			<p>The African Leaders for Nutrition (ALN) is in partnership with the AU and Bill &amp; Melinda Gates Foundation, aimed at sustaining high-level political will and investments in nutrition across the continent. ALN use two advocacy tools – <b>Nutrition Accountability Scorecard</b> (2019) that highlights country progress and provides a snapshot of Africa's progress against global nutrition targets; and the <b>Economic Investment Case for Nutrition</b> (was to be launched in 2019) – a bi-annual review of economic studies of cost-effective nutrition interventions in Africa to identify gaps and needs to finance nutrition targets.</p> <p><b>Banking on Nutrition</b> – AfDB programme that seeks to unlock the nutrition potential in the bank's investment portfolio. Bank launched its 2018-2025 Multi-sectoral Nutrition Action Plan in December 2018. The plan targets nutrition-smart investments in agriculture, water and sanitation, and social protection, and projects a 40 per cent reduction in stunting by 2025. The Action Plan includes the use of <b>school-based food and nutrition interventions</b> covering school feeding, micronutrient supplements, deworming, health promoting behaviours, WASH and an enabling school environment.</p>	<p><a href="https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic%20Documents/Banking_on_Nutrition_ActionPlan_A4_V1d_single.pdf">https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic Documents/Banking on Nutrition ActionPlan A4 V1d single.pdf</a></p>
<b>Economic Community of West African States (ECOWAS)</b>	<b>Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, the Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo</b>	Regional Economic Community	<p>ECOWAS has programmes in food security and child protection but no explicit mention of nutrition. The Interstate Committee for Drought Control in the Sahel (CILSS) is a technical arm of ECOWAS and monitors food security in 17 West African countries. No specific reference to school health and nutrition.</p>	<p><a href="https://www.ecowas.int/">https://www.ecowas.int/</a></p>
<b>Community of Sahel-Saharan States (CEN-SAD)</b>	<b>Benin, Burkina Faso, Central African Republic, Chad, Comoros, Cote d'Ivoire, Djibouti, Egypt, Eritrea, the Gambia, Ghana Guinea-Bissau, Libya, Mali,</b>	Regional Economic Community	<p>Revised Treaty (2013) focuses on two key objectives: regional security; and sustainable development. No information on programmes</p>	<p><a href="https://www.uneca.org/oria/pages/cen-sad-community-sahel-saharan-states">https://www.uneca.org/oria/pages/cen-sad-community-sahel-saharan-states</a></p>

Review of school-based health and nutrition interventions in West Africa region

	<b>Mauritania, Morocco, Niger, Nigeria, Senegal, Sierra Leone, the Sudan, Togo, Tunisia</b>			
<b>Economic Community of Central Africa States (ECCAS)</b>	Angola, Burundi, <b>Cameroon, Central African Republic, Chad, DR Congo, Equatorial Guinea, Gabon, Rwanda, Republic of Congo, São Tomé and Príncipe</b>	Regional Economic Community	ECCAS' priorities are organized around five pillars: peace and security; common market; environment and natural resources; land use planning and infrastructure; and gender and human development. There is limited information on its website. The AUDA/NEPAD website indicates that all ECCAS Member States have signed the CAADP (Comprehensive Africa Agriculture Development Programme)	<a href="https://ceecac-eccas.org/en/#presentation">https://ceecac-eccas.org/en/#presentation</a>
<b>Africa Research Universities Alliance Centre of Excellence in Food Security</b>	Led by University of Pretoria, South Africa in collaboration with <b>University of Ghana</b> , Legon and University of Nairobi. Has association with University of Western Cape and University of Fort Hare (historically disadvantaged universities)	Continental Has links with IPFRI and FANR in SADC	Concern about triple burden of malnutrition, and high intake of low nutrient higher energy food leading to malnutrition, and impact on vulnerable groups especially children. Also notes that many on the Continent rely on agriculture for livelihoods. One of its research focus areas is to explore pathways to providing sufficient, safe, nutritious and consumer driven food for populations of 21 <sup>st</sup> century Africa. Objectives are to design foods with local and indigenous African plants and animals that are affordable, marketable and convenient, nutrient dense, and implement appropriate food processing technologies for SMMEs to manufacture convenient African foods; policies and programmes to ensure nutrient adequate foods are available, culturally acceptable, accessible and affordable to African populations.	<a href="https://arua.org.za/centres-of-excellence/coe-food-security/">https://arua.org.za/centres-of-excellence/coe-food-security/</a>
<b>Regional Observatory of Family Farms (ROPPA)</b>	<b>Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo</b>	Regional producers association	ROPPA is an association of 13 agriculture producer and farmer organizations in West Africa, promoting family farms as the main production system in West Africa. Declarations on International Day of Rural Women (15 October) and World Food Day (16 October) emphasise the role of women in family farms and their empowerment, and the strengthening of family farms as a means to improve food security in the region. Nothing specific on school feeding.	<a href="http://roppa-afrique.org/spip.php?article1">http://roppa-afrique.org/spip.php?article1</a>

Review of school-based health and nutrition interventions in West Africa region

<b>Global Alliance for Improved Nutrition (GAIN)</b>	Offices in African countries: Ethiopia, Kenya, Mozambique, <b>Nigeria</b> and Tanzania	International NGO	GAIN's aim is to make healthier diets more affordable and accessible in the countries GAIN works in. Supports large-scale food fortification in Ethiopia, Kenya, Mozambique, Nigeria and Tanzania; better diets for children in Ethiopia, Mozambique and Nigeria; and adolescent nutrition in Mozambique.	<a href="https://www.gainhealth.org/homepage">https://www.gainhealth.org/homepage</a>
<b>CARE International West Africa region</b>	Benin, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo	International NGO	Operates in over 100 countries globally. Work covers food and nutrition, education and health. Care's programmes focus on addressing health and nutrition of children under-five years and mothers. The organization also works with adolescent girls on improving the health (reducing anaemia) and sexual reproductive health, especially for married adolescent girls. CARE supports smallholder agriculture, especially women, to meet their food needs and develop sustainable livelihoods. There is no reference to school health and nutrition in the organization's description of its programmes.	<a href="https://care.org/our-work/food-and-nutrition/">https://care.org/our-work/food-and-nutrition/</a>
<b>World Vision International</b>	Angola, Burundi, <b>Central African Republic, Chad</b> , DR Congo, Eswatini, Ethiopia, <b>Ghana</b> , Kenya, Lesotho, Malawi, <b>Mali, Mauritania</b> , Mozambique, <b>Niger</b> , Rwanda, <b>Senegal</b>	International NGO	Health Sector and Nutrition Approach 2020-2030 sets the high-level goal: Ensure healthy lives and promote well-being for all children. While children under-five years are the main target of World Vision, the new approach recognises the need to improve the health and nutrition of adolescent girls to reduce under-five mortality and maternal mortality. The approach makes provision for improving dietary diversity and addressing micronutrient and iron deficiency in adolescents 12-18 years. Health and nutrition interventions are linked with other interventions, for example, WASH, child protection, mental health, infectious and neglected tropical diseases.	<a href="https://www.wvi.org/africa">https://www.wvi.org/africa</a>  <a href="https://www.wvi.org/sites/default/files/2020-06/HN%20Sector%20Approach%20%281%20June%202020%29.pdf">https://www.wvi.org/sites/default/files/2020-06/HN%20Sector%20Approach%20%281%20June%202020%29.pdf</a>
<b>Save the Children (International)</b>	<b>Burkina Faso</b> , DR Congo, Ethiopia, Kenya, Malawi, Mozambique, <b>Niger, Nigeria</b> , Rwanda, <b>Sierra Leone</b> , Somalia, South Sudan, Sudan, Tanzania,	International NGO	Save the Children subscribe to the FRESH framework for School Health and Nutrition (SHN), and within the organization, the SHN programme is linked with the Education Sector programmes and seen as a continuation of the Early Childhood Development Programme. Save the Children's SHN programme operates in 30 countries globally. Interventions are adapted to country contexts and needs and include providing school children with access to improved WASH facilities; access to deworming and micronutrient supplementation, vision and	<a href="https://www.savethechildren.org/us/what-we-do/education/school-health-and-nutrition">https://www.savethechildren.org/us/what-we-do/education/school-health-and-nutrition</a>

Review of school-based health and nutrition interventions in West Africa region

	Uganda, Zambia, Zimbabwe		hearing screening, oral health promotion, malaria prevention and treatment, obesity reduction; skills-based health education for developing lifelong health behaviours, including HIV and AIDS prevention; ensuring national policies support schools and communities. Save the Children produced a Health Education Manual (2013) to assist SHN Programme Managers to design and implement health education in schools, for children aged 8-10 years. The lessons cover WASH, Infectious Diseases including Neglected Tropical Diseases, Taking care of our bodies, Preventing diseases and injury, Nutrition, Sexual Reproductive Health including HIV and AIDS prevention.	<a href="https://www.savethechildren.org/content/dam/global/reports/education-and-child-protection/health-ed-man.pdf">https://www.savethechildren.org/content/dam/global/reports/education-and-child-protection/health-ed-man.pdf</a>
<b>Action Against Hunger</b>	<b>Burkina Faso, Cameroon, Central African Republic, Chad, Cote d' Ivoire, DR Congo, Kenya, Liberia, Madagascar, Mali, Mauritania, Niger, Nigeria, Senegal. Sierra Leone, Somalia, South Sudan, UR Tanzania, Uganda, Zimbabwe</b>	International NGO	Operates in 40 countries globally. Funded through private sector foundations and individual donors. Operations cover health and nutrition, food security and WASH. Also covers humanitarian crises. Does not have a specific focus on school health and nutrition.	<a href="https://www.actionagainsthunger.org/">https://www.actionagainsthunger.org/</a>
<b>The Hunger Project (HQ NYC, USA)</b>	Offices in African countries: <b>Benin, Burkina Faso, Ethiopia, Ghana, Malawi, Mozambique, Senegal, Uganda, Zambia</b>	International NGO	Approach focuses on empowerment of women as the core drivers of change. Programmes in Africa support school-feeding (but it appears mainly for preschool children).	<a href="https://thp.org/who-we-are/">https://thp.org/who-we-are/</a>

## Annex D: Summaries of findings of studies reviewed

Table 16: Findings from studies reporting on effect of school feeding on educational outcomes

Reference	Study design, Participants, Sample size	Intervention	Outcomes measured	Main findings
Ampofo and Pac, 2020, Ghana.	Before-and-after evaluation of Government School Feeding Programme (GSFP). Girls in primary School children, aged not specified (n=60).	SFP (meals)	Educational outcomes: Enrolment and attendance	Moderate increase in enrolment rate: Baseline enrolment before SFP in academic year 2007/2008) = 1171 (47.81%) compared with enrolment at time of evaluation (academic year 2017/2018) = 1278 (52.19%). Significant increase in school attendance from n=4884 to n=6903.
Bukari, 2015, Ghana	Non-randomised trial experimental design used to select 360 pupils from participating and nonparticipating SFP public primary school pupils	SFP (meals)	Educational outcomes: Enrolment rate and academic performance	Enrolment rate was 24% for SFP schools, 7% in non-SFP schools. In terms of academic performance, participating pupils performed better in core subjects areas (English Language, Mathematics and Integrated Science) than non-participating pupils
Taylor et al., 2016, Nigeria	Before-and-after evaluation of School Feeding Programme of public elementary school pupils in Osun State, Nigeria.	SFP (meals)	Educational outcomes: Enrolment, attendance, retention and academic performance	Enrolment rate (78.4%), retention rate (44.8%), attendance rate (58.6%), punctuality (69%), and academic performance (55.2%). Baseline results not reported to allow comparison.



Review of school-based health and nutrition interventions in West Africa region

Amponsah, 2018, Ghana	Randomized controlled evaluation of two interventions components of School feeding (Government school feeding/ SFP, home-grown school feeding/ HGSF) and a controlled arm. Participants were primary school children aged 3-20 years (n=26,811: comprising 971278 for SFP, 1228 for the HGSF and 2602 controls.	SFP (meals)	Educational outcomes: Absenteeism, academic performance	School Feeding resulted in 3.9% points reduction in absenteeism (impact higher on boys' absenteeism (-4.3 percentage points)). School Feeding Programme increase ability of children to perform better in mathematics by 0.24% points, and English language by 0.18% points).
Aurino et al., 2018, Ghana	Randomised controlled trial of government SFP. Children randomly assigned to 1. Government School Feeding programme (GSFP), 2. Home-Grown School Feeding (HGSF) and 3. No SFP (control). Primary school children aged 5-15 years (n=3,170).	SFP (meals)	Educational outcomes: academic performance	After two years of implementation, GSFP led to moderate increases in test scores for the average pupil in school catchment areas, ranging between 0.12 and 0.16 standard deviations
Akanbi & Alayande, 2011, Nigeria	Retrospective evaluation of home grown school feeding cohort data (2002-2010)	SFP (meals)	Educational outcomes: Enrolment	Authors only reported that HGSFP results in progressive increase in the enrolment of pupils in public primary schools recorded.
Mahama Sulemana, 2018, Ghana	Before-and-after evaluation (2002-2004). Participants: Primary schools	SFP (meals)	Educational outcomes: Enrolment	Enrolment increased from 23,219 (30.3%) in Primary Schools in 2002 to 28,190 (36.8%) in 2004.
Kazianga et al, 2009, Burkina Faso.	Cross section comparative analysis of two school feeding programmes: one school providing meals in schools daily versus another providing take home rations monthly for girls.	SFP (meals) and take-home rations (THR)	Educational outcomes: Enrolment, attendance and academic performance	Both school feeding schemes increased girls' enrolment by 5 to 6 percentage points. No significant impact on raw scores on mathematics, but time-adjusted scores on mathematics improved slightly for girls. Lower average absenteeism observed. School meals had no significant impact on the nutrition of the children

Review of school-based health and nutrition interventions in West Africa region

Salifu et al, 2018, Ghana	Before-and-after evaluation of the impact of SFP on educational outcomes.	SFP (meals)	Education outcomes: Enrolment	Students' enrolment increased from 4,013 (2004/2005 at baseline) to 10589 students at time of study (2016/2017). Beneficiaries surveyed (97%) attributed the increased to the SFP.
Diderutua, 2018, Ghana	Comparative cross-sectional evaluation of school feeding programme involving 8 schools: SFP (n=4 schools) and non-SFP (n=4 schools). Primary school children, age not specified.	SFP (meals)	Educational outcomes: Enrolment and retention	A slight increase in enrolment recorded in SFP schools: from 2,540 students (2015/16 baseline) to 2,597 students (2017/2018), compared with the non-SFP schools: from 1798 students (2015/16) to 1,811 students (2017/18). Retention increased from 70% (2015/16) to 90% (2017/18) in SFP schools, to 50% (2015/16) to 69% (2017/18) in Non SFP schools.
Abdul-Kudus Mohammed, 2011, Ghana	Before-and-after evaluation of non-government supported school feeding intervention: School children, n= 3601 children in the savelugu district of the northern Ghana.	SFP (meals)	Educational outcomes: Enrolment, retention, academic performance and educational access for the girls.	Annual enrolment rate increased by 4% following introduction of SFP from 2005/2006 to 2006/2007.
Aliu Mohammed, 2014, Ghana.	Comparative cross sectional evaluation comparing outcomes of SFP and no SFP in Tamale Metropolis of the northern region.	SFP (meals)	Educational outcomes: Enrolment and academic performance	Increased enrolment from 34.98% in 2010/2011 to 40% in 2013/2014 academic year. Academic performance (average exam score) increased by 10% (from 52.7% at baseline year to 62.7% 2013/2014).
Anero, 2020, Nigeria	Comparative Cross section analysis comparing completion rate of school SFP programmes school and non-SFP school.	SFP (meals)	Educational outcomes: School completion rate	Completion rate during the feeding programme was higher than when there was no feeding among pupils in Rivers State. No further statistical details were reported. No significant difference between the completion rates of the urban and rural pupils during or before the feeding programme.
Eric and Gyapong, 2014, Ghana	Before-and-after evaluation using multiple data sources: survey, secondary data analysis and documentary review and analysis	SFP (meals)	Educational outcomes: School enrolment, attendance and retention	Increased enrolment in lower primary, higher in male pupils' 11.5 percent than in females' 7.3 percent. Marginal increased attendance rate overall from 70%/80% (before) to 80%/90% in 7 years (2005-2011). Few dropouts observed over the 7 years.

Review of school-based health and nutrition interventions in West Africa region

Nikiema, 2017, Burkina Faso	Before-and-after evaluation of non-government supported school feeding programme on school attendance and girls' enrolment rate within primary schools.	Take home rations (THR)	Educational outcomes: Attendance and enrolment	Girls' enrolment increased by 3.2% while boys enrolment decreased by a similar margin. Overall attendance increased for both boys and girls, but higher in boys (8.4%) than girls (6%).
Abayomi and Bukari, 2014., Ghana	Comparative cross-sectional evaluation involving 360 pupils selected from participating and non-participating schools feeding programme schools.	SFP (meals)	Educational outcomes: academic performance and completion	Improvement in gross enrolment by 24% in SFP compared to 7% in non-SFP schools. Impact higher in boys (51.3%) compared to girls (48.7%). Improvement in academic performance of primary six pupils. Gross pass rate increased by 35% in English, 21% in Mathematics and 18% in Integrated Science in SFP schools compared to a decrease of 26% in English, 34% in Mathematics and 30% in Integrated Science in non-SFP schools. Gross dropout reduced by almost half (48%) in SFP schools, and increased by 49% in non-SFP schools.
Abdul Karim et al. 2018, Nigeria.	Review and appraisal of government school feeding programme in selected public schools in Borno state. Secondary school children, age 5-15 years (n=934)	SFP (meals)	Education (enrolment, attendance and retention) and nutritional outcomes	Improved school enrolment, attendance, retention, and the nutritional health status of beneficiary students.
Galaa and Saka, 2011, Ghana	Before-and-after evaluation of non-government supported school feeding programme, involving primary school children (aged not specified, n=60 out of 196 participating schools sampled).	SFP (meals) + Take home Rations (THR)	Educational outcomes: enrolment, attendance, retention, and health and nutrition status.	Enrolment: Increase from 25% (2004) to 64% (2007), with 15% increase in boys and 20% in girls. Attendance: take home rations increased attendance levels, with overall attendance higher in rations SFP than in non-ration schools. Retention: Author reported that SFP improved retention rates. Health and nutrition status: Author reported that SFP improved health and nutritional status of children, leading to increased retention and educational outcomes in most schools.

Table17: Findings from studies reporting on effect of school feeding on nutrition outcomes

Reference	Study design, Participants, Sample size	Intervention	Outcomes measured	Main findings
Owusu et al. 2016, Ghana.	Comparative cross-sectional survey of Ghanaian School Feeding Programmes: Government Versus Non-Governmental School Feeding Programme. School-aged children were studied.	SFP (meals)	Nutritional outcomes	GSFP met energy and macronutrient recommendation, whereas but GSFP did not. NGSFP provided significantly higher portion size ( $416 \pm 96$ g vs. $243 \pm 50$ g; $p=0.007$ ), energy ( $776 \pm 427$ kcal vs. $315 \pm 24$ kcal; $p=0.042$ ) and fats ( $17 \pm 8$ vs. $6 \pm 2$ ; $p=0.019$ ) but similar micronutrient contributions to GSFP.
Kwabla et al. 2018, Ghana.	Comparative cross-sectional survey of children enrolled in schools with SFP and those without the SFP. Primary school children aged 5-12 years ( $n=359$ ; of which 55.4% in SFP and 44.6% in No SFP).	SFP (meals)	Nutritional outcomes	Prevalence of stunting: 16.2% for SFP and 17.2% for non-SFP schools ( $p=0.28$ ). Prevalence of thinness: (9.3% for SFP, 4.6% for non- SFP schools (4.6%) ( $p = 0.028$ ). Prevalence of overweight: 1.9% for SFP, 0.0% for non-SFP schools ( $p=0.028$ ).
Gelli et al. 2019, Ghana	Cluster Randomised Trials of Ghanaian school feeding programmes. Public primary schools in communities were randomly assigned to 1) control group without intervention or 2) treatment group providing the reformed national school feeding program (which provides 1 hot meal/d to schools children aged 5-15 years ( $n= 2869$ ); Intervention ( $n=1483$ ), Controlled ( $n=1650$ ).	SFP (meals)	Nutritional outcomes	School meals showed no effect on HAZ and BAZ in children aged 5–15 y, but subgroup analysis revealed an improved HAZ in children aged 5- to 8-y-old ((Controls: Mean HAZ – 0.96 (baseline, $n= 760$ ) to -1.13 (endline, $n=601$ ). SFP group: -0.89 (baseline, $n=841$ ) to -0.89(endline, $n=667$ ). effect size = 0.12SDs, $p<0.043$ )).

Review of school-based health and nutrition interventions in West Africa region

Agbozo et al. 2018, Ghana	Comparative cross-sectional survey of children enrolled in public and private schools implementing SFPs. School children aged < 12 years (public, n = 113; private, n=216).	SFP (meals)	Nutritional outcomes (dietary diversity, nutrient composition and intake and anthropometry status)	Meals served in the public and private schools were statistically similar and met recommended requirements. Prevalence of stunting public vs private (8.9% vs. 7.9%; p=0.095), underweight (3.6% vs. 5.7%; p=0.304), thinness (1.8% vs. 3.7%; p=0.332) and overweight/ obesity (3.5% vs. 4.2%; p= 0.782) were statistically similar.
Gelli et al. 2016, Ghana	Cluster-randomised trial around the scale-up of the national school programme. Primary School children (aged 5-15 years) recruited from 116 schools in 58 districts (n=8407), and randomly assigned to 1. School feeding programme, 2. Home-grown school feeding, and 3. Control group.	SFP (meals)	Nutritional/ micronutrient outcomes	Mean z-scores for height-for-age (HAZ) and BMI-for-age were -0.925 (SD 1.35) and -0.592 (SD 0.924) respectively, with significant differences across the GSFP versus HGSF comparison groups. Iron status, as measured through haemoglobin levels, for the sub-sample of children (n = 714) was on average 11.3 g/dL (SD 1.34), just below the 11.5 g/dL cut-off for non-anaemia in children aged 5–11 years.
Abizari et al 2014, Ghana	Comparative cross-sectional survey of nutrient intake adequacy and nutritional status of SFP and non-SFP participants. Primary school children aged 5-15 years (n= 383 comprising n=196 SFP, and 187 from NSFP group).	SFP (meals)	Nutrition outcomes	Energy and nutrient intakes were significantly higher among SFP compared to non-SFP participants (P=0.001). Proportion of SFP participants with energy intake below the requirement was lower than that of non-SFP participants (4.7 v. 21.8 %; P=0.001). No difference was also found in the prevalence of Fe deficiency and Fe-deficiency anaemia between SFP and non-SFP participants. Nutritional status: overweight and obesity/BMI-for-age Z-score was significantly higher for non-SFP participants (P = 0.008). No difference in the prevalence of underweight, stunting and thinness between the two groups.
Aaron et al 2011, Nigeria	Double blind, placebo-controlled trial, involving schoolchildren participating in a pilot school feeding program in Nasarawa State, Nigeria. Primary school children aged 5–13 y old. 566 children randomized to micronutrient treatment group: n = 288; and control group: n = 278. Children received a	SFP (meals)	Nutritional (micronutrients and anthropometry status) and health outcomes	After the 6-mo intervention, children in the micronutrient group were 53% less likely to have low serum retinol [OR (95% CI) = 0.47 (0.27 – 0.81)] and 36% less likely to have low serum zinc [OR (95% CI) = 0.64 (0.44 – 0.93)]. No significant differences in weight gain, linear growth, or change in anthropometric indices during the 6-mo intervention period. No significant differences between groups in the self-reported prevalence of diarrhoea, malaria, or upper respiratory infections.

Review of school-based health and nutrition interventions in West Africa region

	single daily serving of a multi-micronutrients beverage or a placebo beverage 5 d/week for 6 months.			
Danquah et al., 2012, Ghana	Comparative cross-sectional survey of SFP vrs non-SFP schools. Primary and Senior High School children involving total of 234 pupils between 9 and 17 years of age (n=114 SFP schools, and n= 120 non-SFP participants from three participating and three non-participating schools).	SFP (meals)	Nutritional outcomes	Author reported that results did not indicate any association between the school lunch and nutritional status. There was no statistically significant difference in the nutritional status of participants and non-participants
Davidson and Eze, 2012, Nigeria	Non-randomised evaluation involving 300 children (n=150 involved in school lunch programme, and n= 150 from schools not involved in school lunch).	SFP (meals)	Nutritional outcomes	Higher prevalence of malnutrition (stunting 30.7%, wasting 40% and underweight 20%) was observed among children who did not participate in the school meal-plus programme compared with the participating ones (stunting 25.3%, wasting 17.3%, underweight 14.7%).
Azangba-Nyarko, 2017, Ghana	Cluster-randomised controlled trial. Schools clustered into participating government school feeding programme (GSFP-Treatment group), and Non-GSFP participating schools (control group). School age children (n=330).	SFP (meals)	Nutritional outcomes	Participants in the school meals (SCm) treatment group had an average 3.24% increase in height (p≤0.05) and 13.08% increase in weight (p≤0.05) Over the intervention periods. There was also a 17% decrease in anaemia prevalence compared 11% decrease in the control and 9% decrease in GSFP.

Review of school-based health and nutrition interventions in West Africa region

Abdul Karim et al. 2018, Nigeria.	Review and appraisal of government school feeding programme in selected public schools in Borno state. Secondary school children, age 5-15 years (n=934)	SFP (meals)	Education (enrolment, attendance and retention) and nutritional outcomes	Improved school enrolment, attendance, retention, and the nutritional health status of beneficiary students.
Galaa and Saka, 2011, Ghana	Before-and-after evaluation of non-government supported school feeding programme, involving primary school children (aged not specified, n=60 out of 196 participating schools sampled).	SFP (meals) + Take home Rations (THR)	Educational outcomes: enrolment, attendance, retention, and health and nutrition status.	Enrolment: Increase from 25% (2004) to 64% (2007), with 15% increase in boys and 20% in girls. Attendance: take home rations increased attendance levels, with overall attendance higher in rations SFP than in non-ration schools. Retention: Author reported that SFP improved retention rates. Health and nutrition status: Author reported that SFP improved health and nutritional status of children, leading to increased retention and educational outcomes in most schools.

Table 18: Findings from studies reporting on effect of school nutrition education interventions

Reference	Study design	Intervention	Outcomes	Main findings
Lezama et al, 2001, Togo	Longitudinal school-based nutrition education to prevent iodine deficiency disorders. Population: Children in fourth and sixth year at public primary schools (n=613 children in 32 schools)	School nutrition education	Nutrition knowledge: awareness of importance iodine and repercussions	Intervention increased knowledge and positive attitudes and practices regarding IDD. Knowledge score of fourth year pupils was below that of sixth year pupils.
Antwi et al, 2020, Ghana	Before-and-after controlled evaluation of the effect of a six-week nutrition education intervention on the nutrition knowledge, attitude, practices, and nutrition status of school-age children (aged 6-12years) in basic schools in Ghana (n=)	Six-week nutrition education intervention	Nutrition knowledge, attitude, practices, nutrition status and dietary diversity.	Intervention groups had significantly higher nutrition knowledge scores (8.8±2.0 vs. 5.9±2.1, P < 0.0001) compared to controls in the lower primary level. There was no significant difference in dietary diversity scores (4.8±2.0 vs. 5.1±1.4, P = 0.184) or in measured anthropometric indices (3.6% vs. 8.2%, P = 0.08). A marginally lower proportion of stunted schoolchildren was observed among the intervention group compared to the control group (3.6% vs. 8.2%, P = 0.080).

Review of school-based health and nutrition interventions in West Africa region

<p>Ayi et al 2010, Ghana</p>	<p>Before and after evaluation to determine the impact of school-based malaria education intervention on schoolchildren and community adults (only data on children extracted). Intervention group, n=105 children. Control group, n=81 children.</p>	<p>Malaria education in primary schools</p>	<p>Misperception about malaria, and prevalence of parasite</p>	<p>Misperception that malaria has multiple causes was significantly improved among children. Parasite prevalence in schoolchildren decreased from 30.9% to 10.3% (p = 0.003). These positive changes were observed only in the intervention group.</p>
------------------------------	---	---	--	--



Table 19: Findings from studies reporting on effect of school-based deworming intervention

Reference	Study design	Intervention	Outcomes	Main findings
Humphries, 2017, Ghana	Before-and-after assessment of deworming programme to treat hookworm infections. School-age children	Deworming with Albendazole. Children received one dose albendazole (400 mg)	Prevalence of hookworm	Prevalence of hookworm before treatment was 59%. Cure rate after treatment with Albendazole was 35%. Community-wide fecal egg reduction rate (ERR) of 61% (95% confidence interval: 51.8–71.1)
Sufiyan, 2011, Nigeria	Before-and-after assessment of deworming programme to treat hookworm infections. School children aged 6-15 years (n=306).	Deworming with Albendazole/ and hygiene education. Children received one dose albendazole (400 mg)	Haemoglobin level of children	Children were dewormed and had participatory hygiene education lectures (study group) had significantly higher mean haemoglobin, from an initial 10.4 g/dl to a post-intervention of 12.4 g/dl (paired t-test = 13.96; P = 0.00). Rise in the mean haemoglobin of the control group, but not as much as in the treatment group, from an initial mean haemoglobin of 10.5 g/dl to a post-intervention of 11.2 g/dl (paired t-test = 2.89; P = 0.004).
Humphries et al, 2013, Ghana	Before-and-after assessment of deworming programme to treat hookworm infections. School age Children 6-11 years of age attending 16 schools in the Kintampo North Municipality of Ghana (n = 812).	De-worming with one dose Albendazole (400mg)	Prevalence of hookworm, and cure rate	Prevalence of <i>Necator americanus</i> hookworm infection (n = 286) was 39.1%. Cure rate after a single dose (400 mg) albendazole was 43%, and the mean faecal egg count reduction rate was 87.3%.

Review of school-based health and nutrition interventions in West Africa region

<p>Ofosu et al., 2014, Ghana</p>	<p>Before-and-after assessment of school-based deworming programme. School age children (n=286) recruited from seven beneficiary basic schools.</p>	<p>Deworming with one dose Albendazole (400mg)</p>	<p>Impact on absenteeism, measuring soil transmitted helminthic re-infections and prevalence of Soil transmitted helminthic (STH).</p>	<p>Results show that STH prevalence among school-aged children was 6%. Children infected with STH had missed more than one school day in the second term. Following the deworming school attendance recorded 8% decrease in absenteeism among the participants of the study from 23.7% before deworming in the first term to 15.7% after deworming in the second term.</p>
<p>Hürlimann et al., 2014, Cote D'Ivoire.</p>	<p>Before and after evaluation of deworming intervention to determine the effect of deworming against soil-transmitted helminthiasis and schistosomiasis on children's physical fitness, cognition and clinical parameters in a malaria-helminth co-endemic setting. 5-month follow-up among schoolchildren aged 5-14 years (sample size not stated).</p>		<p>Prevalence of anaemia and nutritional status, and cognitive and physical fitness</p>	<p>Deworming showed no effect on haemoglobin levels and anaemia, but children with moderate- to heavy-intensity Schistosoma infection at baseline gained weight more pronouncedly than non-infected children. Children with soil-transmitted helminth or Schistosoma infection at baseline performed significantly better in the sustained attention test than their non-infected counterparts at the 5-month follow-up. Lower scores in strength tests were significantly associated with children with harbouring nutritional deficiencies.</p>

Table 20a-e: effectiveness of School-based HIV interventions

<b>Author, Year and country</b>	<b>Study design, participants, sample size</b>	<b>Intervention, duration</b>	<b>Outcomes measured</b>	<b>Main outcomes</b>
Adeomi et al. 2014, Nigeria.	Design: Pre-post quasi-experimental. Participants: in-school adolescents in secondary school Sample size: (n=400)	Intervention: peer-led HIV education intervention to improve HIV knowledge, attitude, and preventive practices among in-school adolescents in Osun State. Recruitment: participants recruited at pre-intervention, End-of intervention & Post intervention. <i>Duration: 2 weeks, plus 12 weeks post-intervention follow-up.</i>	Knowledge, attitudes towards HIV/AIDS and preventive practices	After intervention, peer education also had a significant impact on the students' attitudes towards HIV/AIDS and people living with it. Those with good knowledge and positive attitudes towards HIV/AIDS increased significantly from 50.0% to 86.7% and from 49.0% to 85.6%, respectively.
Elebiju et al. 2013, Nigeria.	Design: Pre-post quasi-experimental. Participants: In-school adolescents in secondary school. Sample size: (n=220).	Intervention: Peer-and parent-led HIV educational intervention to improve the perception of in-school adolescents towards HIV prevention. Recruitment: participants recruited and randomly assigned equally to three intervention, and controls/no intervention group in Ogun state. <i>Duration: 8 weeks.</i>	HIV risk perception	A moderate level of perception recorded after 8-weeks follow-up, and this increased post intervention for participants in intervention group compared to controls.
Chizoba et al. 2020, Nigeria.	Design: Pre-post quasi-experimental. Participants: in-school adolescents	Intervention: Peer and health provider-based HIV intervention to improve HIV/AIDS knowledge and behaviour risk among in-school adolescents. Recruitment: randomly assigned equally into two intervention groups (1. Peer-educators, ii, delivered HIV education. HIV education was	HIV knowledge and Behaviour Risk	At baseline mean knowledge score was 48.8 and behaviour risk was 42.3. At end of intervention, significant changes were observed in terms of knowledge and behaviour risk reduction in intervention groups. No change was observed in

Review of school-based health and nutrition interventions in West Africa region

	in secondary school. Sample size: (n=1831).	delivered by health provider) and controls or no intervention group. <i>Duration: 3 months post-interventions.</i>		control group. Provider-based group had higher knowledge gain and better behaviour risk reduction compared to the peer-based group.
Arnold et al. 2021, Nigeria.	Cluster Randomised Controlled Trial. Participants: in-school adolescents in secondary school from 30 schools. Sample size: (n=9625)	Intervention: Family life health education intervention to decrease youth vulnerability to HIV infection. Recruitment: randomly assigned to 2 interventions: i. family life health education programme (FLHE) only, ii. Family and community programme (FLHE+C), and control or no intervention groups. <i>Duration: Unclear.</i>	Reduction in youth vulnerability to HIV infection	Interventions demonstrated positive effects on rejection of myths, attitudes related to abstinence and use of condoms, and sexuality.
Arnold, 2012 Nigeria.	Design: Cluster randomised Controlled Trial – mixed qualitative-quantitative. Participants: secondary school students. Sample size: (n=2589).	Intervention: Family Life and HIV Education (FLHE) intervention provided to in school and out of secondary school adolescents to raise AIDS Competency of rural communities. Recruitment: randomly assigned into 2 intervention arms: i. Family life health education (FLHE) only, ii. Family life and HIV education, iii. Control or no intervention. <i>Duration: 3 months.</i>	Promote positive behaviours, reduce risk	Results demonstrated positive effects on rejection of HIV myths, attitudes related to abstinence and use of condoms, and sexual activity among the two-intervention group. No effect on controls.

**Table 20b: effectiveness of School-based HIV interventions**

Author, Year and country	Study design, participants, sample size	Intervention, duration	Outcomes measured	Main outcomes
Ofoegbu et al 2020, Nigeria.	Design: Randomized controlled trial. Participants: in school adolescents in secondary school. Sample size: (n=98).	Intervention: HIV prevention intervention using educational digital storytelling (EDSI) aim at delaying sexual initiation, reducing sexually transmitted infections (STIs) and preventing pregnancy, targeting junior high school students. Recruitment: randomly assigned to intervention and controls or no intervention. <i>Duration: 8 weeks.</i>	Knowledge of positive HIV practices, including delayed sexual initiation and HIV risk perception	EDSI was effective in increasing HIV risk perception and knowledge among adolescents in the treatment group compared with those in the no-treatment control group.
Nwaozuru et al. 2017, Nigeria.	Design: Randomised controlled trials. Participants: secondary school students. Sample size: (n=319).	Intervention: Tested and evaluated the acceptability, feasibility and efficacy of a theory-based combination income-generating HIV prevention intervention to promote risk-reduction intentions and efficacy among adolescent girls. Recruitment: randomly assigned to an intervention (received information on risk reduction + training on micro finance and credit) and controls (only information on HIV risk-reduction). Duration: NS	HIV risk-reduction	Participants in the intervention group showed a significant increase in safe sex efficacy and reductions in sexual risk-taking intentions overtime compared to comparison group.
Krugu et al. 2018, Ghana.	Design: Randomised controlled trials. Participants: In-school adolescents in secondary school. Sample size: n =1822(baseline), n=1805 (endline) and n=1959 (six months post-intervention).	Intervention: Peer-led sexual education intervention, using diverse range of theory-based methods, to reduce risk-taking behaviours related to sexually transmitted infections (STIs) among in-school adolescents. Recruitment: randomised into intervention (interactive lessons) and controls or no interactive lessons. <i>Duration: 6 months</i>	Risk-taking sexual behaviours related to sexual transmitted infections (STIs), condom use and STI testing.	Intervention led to a reduction in risk-taking sexual behaviours related to STIs and pregnancy prevention, increased condom use, and STI testing among the participating adolescents.

Review of school-based health and nutrition interventions in West Africa region

Masa et al. 2020, Ghan.a	Design: Pre-post quasi-experimental. Participants: In-school adolescents in secondary school. Sample Size: (n= 957).	Intervention: HIV prevention intervention using financial inclusion model to reduce sexual risk taking and victimisation among adolescents' youth in Ghana. Recruitment: randomly assigned to one of intervention group (i. school-based savings-SBSP, ii. marketing campaign), and control or no intervention group. <i>Duration: 4 years post intervention.</i>	Sexual risk taking and victimization	Financial inclusion project was not associated with positive changes in sexual risk behaviours and victimization. In contrast, SBSP was significantly associated with higher likelihood of condom use and lower probability of sexual victimization.
Adam and Danawi, 2016; Ghana.	Design: Pre-post quasi-experimental. Participants: in-school adolescents' from a rural secondary school. Sample size: (n=2014).	Intervention: HIV prevention intervention, using peer-education method, to motivate positive condom use intention with future sexual partners among high school students. Recruitment: randomly assigned to intervention (xxx) and control or no intervention). <i>Duration 2 weeks.</i>	Condom use intention with future sexual partners	Results showed that condom use intentions positively changed following participation in the HIV/AIDS education intervention. The percentage change in condom use intentions from baseline to follow-up was statistically significant ( $X^2(2) = 18, p < 0.001$ )
Agbaje, 2015, Nigeria.	Design: Pre-post quasi-experimental. Participants: in school adolescents in secondary school (n=175).	Intervention: Peer-led education program to increase HIV knowledge to reduce risky behaviours among school youths in AMAM Local Government Area in Abuja. Recruitment: randomly assigned to intervention group (trained in-school youth peer educators, n=75) and controls (non-trained youth peer educators, n=100). <i>Duration: 8 weeks.</i>	HIV Knowledge, risk behaviour and acquisition of life skills	Intervention resulted in increase in the youth knowledge of HIV/AIDS, adoption of preventive behaviour and acquisition of life skills.

**Table 20c: effectiveness of School-based HIV interventions**

Author, Year and country	Study design, participants, sample size	Intervention, duration	Outcomes measured	Main outcomes
Ezeama et al. 2017, Nigeria.	Design: Pre-post controlled quasi-experimental. Participants: in-school adolescents in secondary schools. Sample size: (n=165).	Intervention: HIV prevention intervention using classroom instructional (CI) and drama (DR) strategies to improve HIV knowledge and positive attitudes towards HIV prevention among in-school adolescents. Recruitment: recruited from 3 secondary schools and randomly assigned to two experimental groups (i. involved classroom Instruction - CI and, ii. drama – DR), and a control or no intervention. <i>Duration: 8 weeks.</i>	HIV knowledge and attitudes	Knowledge scores increased slightly from 20.5±2.7 to 22.7±2.7 (CI), 20.4±2.6 to 22.6±1.8 (DR) and 21.1±2.7 to 21.2± 0.3 for control groups at end of intervention. At post intervention follow up, scores for CI and DR increased to 23.9±1.8 and 24.5±1.4 respectively while the score for the control dropped to 20.0±2.8. Scores for attitude for CI, DR and control groups increased from 5.3±1.4 to 5.1±1.2 (for CI), 4.9±1.5 to 5.0±0.9 (DR), while in Controls the scores dropped from 5.3±1.0 to 4.7±1.5 at end of the intervention. At post intervention follow up, scores for CI, DR and Controls were 5.3±1.2, 5.6±0.7 and 4.5±1.2, indicating greater increase among the intervention groups than that of control
Ezegbe et al. 2018, Nigeria.	Design: Pre-post quasi-experimental design. Participants: in-school adolescents in secondary schools. Sample Size: (n=80).	Intervention: HIV prevention intervention to test the efficacy of a rational emotive digital storytelling (RED Story) therapy on knowledge and perception of risk of HIV/AIDS among schoolchildren. Recruitment: randomly assigned to the intervention group (the RED Story), and no intervention (waiting for delayed intervention). <i>Duration: 8 weeks</i>	HIV Knowledge HIV perceived Risk	The results show that RED Story therapy had a significant effect in increasing knowledge level and perceived risk of HIV among schoolchildren compared to those in waitlisted control group. Positive benefits of this study were significantly sustained by the treatment group at the follow-up
Ogunsanmi and Agbede,	Design: Pre-post quasi-experimental. Participants: in-school adolescents in secondary school.	Intervention: Peer-led sexual improvement education and telephone health messaging to increase sexual self-esteem and assertiveness in adolescents in Ibadan. Recruitment: recruited from 4	Risky sexual behaviours, self-esteem, sexual assertiveness	Combination of peer-led sexuality education (PSE) and telephone health messaging (THM) intervention had a greater effect on reducing adolescents' risky sexual behaviours, increasing self-esteem and sexual assertiveness compared to

Review of school-based health and nutrition interventions in West Africa region

2020, Nigeria.	Sample Size: (n=120).	schools and randomly assigned to 3 interventions (i. peer-led, ii. health message, and iii. combination both), and control or no intervention group. Duration: 4 weeks		the standalone intervention programs or no intervention.
Adeleye et al. 2014; Nigeria.	Design: Pre-post quasi-experimental. Participants: in-school adolescents in secondary school. Sample size: (n=400).	Intervention: Peer-led HIV prevention intervention to improve HIV knowledge, attitude, and preventive practices among in-school adolescents. Recruitment: recruited from 2 secondary schools and randomly assigned to intervention (HIV/STIs trained peer educators), and control or no intervention group. Duration: 2 weeks	Knowledge and awareness about HIV	After the intervention, the level of awareness about AIDS significant increased from 96.5% to 100% in the study group, as well as increased knowledge about HIV transmission and methods of prevention ((50.0% to 86.7%). No significant differences were observed in the control group. Three months after the intervention, the number of sexual partners and sexual behaviours among the intervention group also significantly reduced compared to the controlled participants.
Fummilayo et al 2020, Nigeria.	Design: Pre-post quasi-experimental. Participants: in-school adolescents in secondary schools. Sample size: (n=220).	Intervention: Peer and parent-led HIV prevention intervention to increase Self-Efficacy as a Correlate of HIV Prevention among in school Adolescents. Recruitment: randomly assigned to one of three experimental group (i. peer-led, ii. Parents-Led, and a combination of i. & ii.), and no intervention group. Duration: 8 weeks.	Levels of self-efficacy on HIV prevention	The mean self-efficacy recorded show that majority of the adolescents were within moderate level of self-efficacy at baseline. After the intervention, the levels of self-efficacy significantly increased for all three-intervention groups, but highest in the combined peer-and parent-led. No significant changes in the level of self-efficacy were observed among controls. The parent-led group had a difference increase of 2.182 (p<0.01) self-efficacy post intervention follow up.



**Table 20e: effectiveness of School-based HIV interventions**

<b>Author, Year and country</b>	<b>Study design, participants, sample size</b>	<b>Intervention, duration</b>	<b>Outcomes measured</b>	<b>Main outcomes</b>
Olapeju, no date, Nigeria.	Design: Pre-post quasi-experimental.  Participants: in-school adolescents from 8 public secondary schools.	Intervention: HIV prevention intervention using Roundrobin brainstorming and Think-pair-share instructional strategies to increase knowledge and improve preventive practices among in school adolescents: Recruitment: participants were assigned to 2 intervention groups (Round Robin Brainstorming – RRB, and Think Pair-Share - TPS), and a no intervention group.  <i>Duration: 8 weeks.</i>	HIV knowledge and Attitudes HIV perceived Risk,	The intervention shows a significant positive effect on students' knowledge of HIV/AIDS. In terms of knowledge score, the students exposed to the TPS intervention performed best ( $\bar{x}$ = 90.63), followed by RRB ( $x$ = 77.01) and the controls ( $\bar{x}$ =66.68). In terms of attitudes, the students exposed to TPS demonstrated a higher positive attitude ( $\bar{x}$ =62.05), followed by the RRB ( $\bar{x}$ =51.97) and the Control group ( $\bar{x}$ =42.21) respectively, post intervention. For HIV risk measured, the results show that students exposed to TPS had the highest post-test mean score of perceived risk ( $\bar{x}$ = 68.65) followed by those in RRB ( $\bar{x}$ = 54.99).
Duflo et al 2012, Cameroon.	Design: Cluster randomized control trials. Participants: in-school adolescents from 318 secondary school. Sample size: (Not stated).	Intervention: HIV Behaviour change intervention to test whether the type of HIV information messenger, and the type of information affect how much information is retained, how much information is transmitted to peers, and how reported behaviour changes among girls and their friends. Recruitment: randomly assigned to one of 4 groups - (i) control, (ii) basic treatment (staff received 2-day training on HIV prevention pedagogy, (iii) treatment with an outside consultant (only differs from i in terms of duration & number of sessions, and (iv) treatment with an outside consultant plus a "relative risk" message (only differs from i & ii in terms of content and information delivered)  <i>Duration: 8 weeks.</i>	Self-reported outcomes: Sexual behaviour (sex partners, use of condom and sexual activities)  Life outcomes (child bearing and schooling)  Others: HIV knowledge – mode of transmission and prevention.	None of the three interventions unambiguously reduced risk-taking in all three-study areas: the basic treatment was effective only in the South, while the TC intervention was effective in the West, ineffective in the South and even backfired in Yaoundé. Including the Relative Risk information to the consultant intervention showed some positive effects in Yaoundé but rather negative ones in the West. The relative risk message yielded no significant impact on any of the life outcomes.

Review of school-based health and nutrition interventions in West Africa region

<p>Anyaegbunam et al., 2014. Nigeria.</p>	<p>Design: Pre-post quasi experimental. Participants; in-school adolescents from 24 instruction classes of twenty-four secondary schools. Sample size: (n=955).</p>	<p>Intervention: HIV prevention intervention to use constructivist Theatre Instruction (CTI) to enhance students' knowledge of HIV and AIDS. Recruitment: randomly assigned to intervention group (taught script writing and encouraged to write dramas on HIV and AIDS), and control group (taught with conventional method). Duration: <i>4 days, 1 hour per-day.</i></p>	<p>Knowledge of HIV and AIDS, and educational performance</p>	<p>Students who participated in the intervention compared with control participants had higher mean scores (mean score 61.7) compared to those taught with the conventional method (Mean score 39.3). Mean score of HIV knowledge increased among intervention participants from 41.9 (pre-intervention) to 50.0 (post-intervention) in rural areas, and 37.0 (pre-intervention) to 66.5 (post-intervention) in urban areas.</p>
<p>Atwood, Liberia, 2012,</p>	<p>Design: Attention-matched, group randomized controlled trial. Participants: school adolescents attending elementary or middle school in Liberia. Sample size: (n=812)</p>	<p>Intervention: HIV prevention intervention to promote attitudes and skills for safer sex among adolescents' youth in second cycle schools. Recruitment: randomly assigned to intervention and no intervention groups. Intervention participants received eight-module programme to promote attitudes and skills for safer sex. These include positive attitudes towards condom use, skills to negotiate condom use, refuse sex and use condoms effectively. Duration: <i>8 weeks, and 3- and 9- months post intervention follow up.</i></p>	<p>AIDS knowledge, Self-efficacy, Peer norms, Perceived HIV risk and sexual and condom use attitudes</p>	<p>The intervention significantly impacted protective peer norms and positive condom attitudes and increased frequency of condom use at the nine-month follow-up. Impact in the number of sex partners, at 3 months follow-up but at 9-month follow up no impact was seen. No significant impact on sexual initiation rates for the whole sample at 3- and 9-month follow-up.</p>

Table 21a-b: effectiveness of School-based WASH interventions

Author, Year and country	Study design, participants, sample size	Intervention, duration	Outcomes measured	Main outcomes
Akwaah and Siaw, 2019, Ghana.	Design: Pre-post descriptive experimental. Participants. Secondary school students. Sample size: (n=120).	Intervention: Hand washing education intervention to promote hand washing in secondary schools. Students were randomly selected from 3 strata to join the intervention. They received handwashing education and demonstrations on how to perform effective and proper handwashing. Duration: NS	Hand washing frequency, students experience and knowledge of the interventions.	Improvement in frequency and how students prioritised and washed their hands after visiting the toilet - increased from 64% pre- to 90% post-intervention, playing games (22% to 71.3%), and before eating meals (76% to 99.6%).
Dorgbetor, 2015, Ghana.	Controlled comparative design. Participants: 120 public secondary schools. Intervention schools. Sample size: (n=120).	Intervention: Menstrual hygiene management (MHM) intervention. Aim: an evaluation of the effectiveness of promotion of MHM activities in schools. Process: participants assigned to intervention (n=60 schools using play-based approach in promoting MHM), and control (n=60 schools which are not using the play-based approach). Duration: NS	Knowledge and confidence in discussion MHM, attitudinal change, & positive hygiene practices. Not much information is reported.	The study indicated positive attitudes in boys towards menstruating girls and improved personal hygiene among adolescent girls.
Erismann, 2017, Burkina Faso.	Cluster-randomised controlled post intervention follow up survey. Participants: In-school children aged 8-14 years (primary	Intervention: Combination of WASH and nutrition- based intervention linked to school garden programme implemented to improve health and nutrition status of schoolchildren. The intervention group benefited from complementary nutrition and WASH	Health and nutritional status, prevalence of intestinal parasitic infections.	Between the baseline and end line surveys, the prevalence of intestinal parasitic infections decreased in children from both the intervention and control groups (from 90% to 62%, and from 82% to 72%, respectively) with a significantly stronger decrease in children from the intervention group. Adequate handwashing practices before eating and

Review of school-based health and nutrition interventions in West Africa region

	<p>&amp;secondary schools).</p> <p>Sample size: (n= 385).</p>	<p>interventions linked to the school garden programme. Duration: 1years post intervention follow up survey.</p>		<p>after using latrines at schools increased significantly more among children from the intervention group.</p>
<p>Garn et al 2017, Mali.</p>	<p>Matched-control trial. Participants: 100 beneficiary primary and secondary schools and 100 matched control schools (40 school children):</p> <p>Sample size: 20 boys and 20 girls) sampled from each participating and control schools.</p>	<p>Intervention: Comprehensive WASH intervention to improve health and educational outcomes. Duration: described as 3 years post intervention follow-up survey.</p>	<p>Programme target: water supply, sanitation, handwashing, and WASH supplies. Health and educational outcomes measured reported incidence of diarrhoea, respiratory symptoms, and absence from school.</p>	<p>Adherence was inconsistent across schools, but beneficiary schools on average met more WASH targets than matched control schools. Beneficiary schools also met more WASH targets at follow-up than at baseline. Very few of the targets were individually associated with health and absenteeism outcomes. Increasing achievement of multiple WASH targets together was associated with a lower odds of pupils having diarrhoea (P trend &lt; 0.01) and having respiratory symptoms (P trend &lt; 0.01), but was not associated with roll-call absence (P trend = 0.14) or pupil-reported absence (P trend = 0.41).</p>
<p>Boubacar and Tohon, 2014, Niger.</p>	<p>Pre-post Quasi Experimental. Participants: 6 secondary schools (sample of children aged 7 to 12 years; n = 720)</p>	<p>Installation of clean water outlets, latrines, handwashing stations and clean drinking water; student, teacher and parent hygiene education; display of hygiene promotion materials. Duration: NS</p>	<p>Student-reported symptoms of diarrhoea, water consumption habits, sources of drinking water at school, latrine usage, hygiene behaviours. Teacher reported student absence. STH infection diagnosed via stool samples.</p>	<p>A reduction in self-reported diarrhoea cases and abdominal pain was noted in both intervention and control schools. Student absence increased post-project, but not as much as in control schools. Carriage of at least one parasite reduced in intervention schools, but findings were not statistically significant. There was an increase in reported handwashing in intervention school.</p>

NS=not stated

**Table 21b: effectiveness of School-based WASH interventions**

<b>Author, Year and country</b>	<b>Study design, participants, sample size</b>	<b>Intervention, duration</b>	<b>Outcomes measured</b>	<b>Main outcomes</b>
Montgomery et al. 2012, Ghana.	Non-randomised controlled trial. Participants: school girls between the ages of 12 and 18 from four villages secondary school. Sample size: (n=120)	Intervention: sanitary pad provision with education. Arms of trial include provision of pads with puberty education; puberty education alone; or control (no pads or education). Duration: 3- and 5- months post intervention follow up.	School attendance.	After 3 months, providing pads with education significantly improved attendance among participants, ( $\lambda = 0.824$ , $F = 3.760$ , $p = .001$ ). After 5 months, puberty education alone improved attendance to a similar level ( $M = 91.26$ , $SD = 7.82$ ) as sites where pads were provided with puberty education (Rural $M = 89.74$ , $SD = 9.34$ ; Periurban $M = 90.54$ , $SD = 17.37$ ), all of which were higher than control ( $M = 84.48$ , $SD = 12.39$ )
Ugwuoke et al. 2017, Nigeria.	Comparison group pre-post-test design. Participants: students in 51 public primary schools. Sample size: (n=9746)	Intervention: hand-washing education. Participants randomly assigned to intervention (promoting WASH facilities) and control groups (not promoting WASH activities). Duration: NS	Knowledge and skills of handwashing	Mean achievement gain on: knowledge of hand washing of the intervention group ( $x = 10.87\%$ ) was higher than the comparison group ( $x = .08\%$ ); skills of hand washing of the intervention group ( $x = 12.81\%$ ) was greater than the comparison group ( $x = 4.40\%$ ).
Trinies et al. 2016, Mali.	Matched-control trial. Participants: in-school children from 100 beneficiary schools and 100 matched comparison primary schools in 5-6 sessions	Intervention: WASH intervention on pupil absence, diarrhoea and respiratory infections. Intervention activities include installing or rehabilitating water points and latrines; distributing WASH supplies: handwashing and drinking water containers, soap, anal cleansing kettles, trash bins, brooms, and disinfectant; and carrying out hygiene promotion activities in and around the schools, and training teachers	Pupil absence in school, diarrhoea and respiratory infections.	School-based WASH intervention can have a positive effect on reducing rates of illness, as well as absence due to diarrhoea. However, we did not find evidence that these health impacts led to a reduction in overall absence. The odds of pupils being absent at roll call were 23% higher in beneficiary schools than in comparison schools (odds ratio [OR]: 1.23, 95% confidence interval [CI]: 1.06, 1.42). The odds of pupils reporting being absent due to diarrhoea (OR: 0.73, 95% CI: 0.56, 0.94) or having had diarrhoea (OR: 0.71, 95% CI: 0.60, 0.85) or respiratory infection symptoms (OR: 0.75, 95% CI: 0.65, 0.86) in the past

Review of school-based health and nutrition interventions in West Africa region

		and school management committees. Duration: 14-month period		week were lower in beneficiary schools compared with comparison schools.
Chard et al 2018, Mali.	Matched control trial. Participants: 42 primary schools; 21 intervention and 21 matched comparison secondary Schools.	Comprehensive school-based WASH intervention: school WASH infrastructure, WASH supplies and hygiene kits, behaviour change and training activities for students and teachers and within wider community, establishment of school-level financial, governance and management systems. Duration - NS	Vector-transmitted disease (dengue), food/ water transmitted enteric disease ( <i>Escherichia coli</i> and <i>Vibrio cholerae</i> ), and person-to-person transmitted enteric disease (norovirus)	Food/water-transmitted enteric disease and person-to-person transmitted enteric disease was lower among pupils attending beneficiary schools. There was no evidence of difference in vector-transmitted disease.

NS=not stated

Table 22: Results of statistical analysis of nutrition problems impacting on schoolchildren and adolescents

Countries	Protein-energy malnutrition	Iodine deficiency	Vitamin A deficiency	Dietary iron deficiency
Liberia	0.23 (95%CI: 0.31,0.16)	0.4 (95%CI: 0.57,0.26)	0.96 (95%CI: 1.47,0.61)	14.71 (95%CI: 19.7,10.17)
Mali	0.45 (95%CI: 0.59,0.35)	0.46 (95%CI: 0.68,0.3)	2.29 (95%CI: 2.99,1.6)	39.41 (95%CI: 44.8,33.59)
Benin	0.28 (95%CI: 0.39,0.21)	0.52 (95%CI: 0.75,0.34)	2.25 (95%CI: 3,1.59)	20.71 (95%CI: 25.16,16.33)
Mauritania	0.37 (95%CI: 0.49,0.27)	1.61 (95%CI: 2.33,1.08)	0.97 (95%CI: 1.41,0.63)	26.58 (95%CI: 32.67,16.35)
Burkina Faso	0.34 (95%CI: 0.45,0.26)	0.54 (95%CI: 0.8,0.34)	2.68 (95%CI: 3.61,1.94)	33.17 (95%CI: 40.82,26.25)
Nigeria	0.73 (95%CI: 1,0.51)	0.6 (95%CI: 0.85,0.4)	0.41 (95%CI: 0.56,0.29)	31.15 (95%CI: 36.21,26.53)
Cameroon	0.29 (95%CI: 0.4,0.21)	0.42 (95%CI: 0.61,0.27)	1.98 (95%CI: 2.66,1.38)	17.53 (95%CI: 22.71,12.97)

Review of school-based health and nutrition interventions in West Africa region

Cape Verde	0.33 (95%CI: 0.45,0.23)	0.89 (95%CI: 1.29,0.59)	0.52 (95%CI: 0.75,0.34)	24.85 (95%CI: 30.31,19.18)
Sao Tome and Principe	0.3 (95%CI: 0.42,0.21)	0.48 (95%CI: 0.71,0.31)	1.67 (95%CI: 2.57,1.01)	23.39 (95%CI: 29.97,16.91)
Chad	0.34 (95%CI: 0.44,0.26)	0.62 (95%CI: 0.91,0.4)	2.47 (95%CI: 3.2,1.79)	28.07 (95%CI: 33.32,22.88)
Senegal	0.26 (95%CI: 0.35,0.19)	0.9 (95%CI: 1.3,0.59)	1.18 (95%CI: 1.7,0.79)	35.29 (95%CI: 39.69,30.51)
Cote D'Ivoire	0.27 (95%CI: 0.36,0.2)	0.54 (95%CI: 0.78,0.35)	1.37 (95%CI: 1.96,0.96)	25.85 (95%CI: 30.59,20.7)
Sierra Leone	0.29 (95%CI: 0.39,0.21)	0.7 (95%CI: 1.0,0.46)	2.01 (95%CI: 2.68,1.4)	28.03 (95%CI: 32.42,23.87)
Gambia	0.41 (95%CI: 0.57,0.3)	1.66 (95%CI: 2.46,1.11)	1.97 (95%CI: 2.71,1.36)	37.45 (95%CI: 42.63,32.31)
Togo	0.35 (95%CI: 0.48,0.26)	1.06 (95%CI: 1.54,0.69)	1.82 (95%CI: 2.51,1.23)	28.15 (95%CI: 32.71,23.48)
Niger	0.32 (95%CI: 0.43,0.23)	1.41 (95%CI: 2.13,0.95)	3.82 (95%CI: 4.87,2.86)	30.21 (95%CI: 35.53,24.6)
Guinea	0.25 (95%CI: 0.33,0.19)	1.27 (95%CI: 1.87,0.84)	1.99 (95%CI: 2.76,1.37)	21.41 (95%CI: 26.07,16.73)
Guinea Bissau	0.25 (95%CI: 0.34,0.19)	1.61 (95%CI: 2.35,1.08)	2.19 (95%CI: 2.91,1.57)	28.33 (95%CI: 33.47,22.96)
Ghana	0.29 (95%CI: 0.38,0.22)	1.1 (95%CI: 1.63,0.73)	1.37 (95%CI: 1.97,0.93)	22.09 (95%CI: 27.88,16.82)
West Africa	0.51 (95%CI: 0.69,0.37)	0.7 (95%CI: 1.02,0.47)	1.29 (95%CI: 1.42,1.16)	29.11 (95%CI: 31.69,26.65)

Table 23: Results on statistical analysis of parasitic infection affecting school children and adolescents

<b>Countries</b>	<b>Ascariasis</b>	<b>Trichuriasis</b>	<b>Hookworm</b>
Liberia	20.3 (95%CI: 24.82,15.87)	11.12 (95%CI: 14.36,8.34)	11.97 (95%CI: 15.06,9.41)
Mali	22.76 (95%CI: 31.59,15.36)	6.96 (95%CI: 10.54,4.33)	9.88 (95%CI: 13.72,6.69)
Benin	7.77 (95%CI: 11.61,4.71)	5.18 (95%CI: 7.85,3.26)	12.45 (95%CI: 16.99,8.73)
Mauritania	5.69 (95%CI: 8.55,3.41)	6.96 (95%CI: 10.74,4.32)	11.15 (95%CI: 15.5,7.57)
Burkina Faso	19.72 (95%CI: 27.35,13.44)	4.41 (95%CI: 6.56,2.77)	3.85 (95%CI: 5.43,2.59)
Nigeria	16.1 (95%CI: 21.41,11.84)	3.58 (95%CI: 5.15,2.38)	6.21 (95%CI: 8.15,4.65)
Cameroon	7.96 (95%CI: 11.83,4.92)	8.33 (95%CI: 12.52,5.38)	6.45 (95%CI: 9.04,4.35)
Cape Verde	5.2 (95%CI: 7.92,3.24)	5.63 (95%CI: 8.3,3.64)	2.56 (95%CI: 3.77,1.7)
Sao Tome and Principe	11.33 (95%CI: 17.09,7.17)	4.95 (95%CI: 7.4,3.11)	1.14 (95%CI: 1.67,0.77)
Chad	13.82 (95%CI: 20.18,8.91)	8.94 (95%CI: 13.15,5.61)	33.73 (95%CI: 43.64,25.42)
Senegal	15.16 (95%CI: 21.98,9.86)	16.08 (95%CI: 21.03,11.99)	15.03 (95%CI: 19.64,11.18)
Cote D'Ivoire	5.54 (95%CI: 8.2,3.52)	4.2 (95%CI: 6.15,2.7)	6.69 (95%CI: 9.33,4.55)
Sierra Leone	10.41 (95%CI: 14.92,6.69)	8.58 (95%CI: 12.39,5.72)	14.01 (95%CI: 18.56,10.25)
Gambia	7.23 (95%CI: 10.84,4.37)	5.18 (95%CI: 7.9,3.28)	4.95 (95%CI: 6.94,3.45)
Togo	7.79 (95%CI: 11.31,5.1)	6.58 (95%CI: 9.22,4.27)	26.04 (95%CI: 33.07,19.52)



Review of school-based health and nutrition interventions in West Africa region

Niger	14.2 (95%CI: 20.39,9.26)	7.1 (95%CI: 10.54,4.56)	13.2 (95%CI: 18.18,9.35)
Guinea	17.09 (95%CI: 24.75,11.14)	7.16 (95%CI: 10.67,4.59)	8.77 (95%CI: 12.57,5.78)
Guinea Bissau	8.12 (95%CI: 12.11,4.95)	9.12 (95%CI: 13.47,5.8)	37.01 (95%CI: 47.24,27.17)
Ghana	4.31 (95%CI: 6.55,2.64)	3.2 (95%CI: 4.83,2.04)	13.78 (95%CI: 18.49,10.05)
West Africa	14.06 (95%CI: 16.78,11.9)	5.31 (95%CI: 6.16,4.54)	9.41 (95%CI: 10.52,8.38)

## Review of school-based health and nutrition interventions in West Africa region

Table 24: Results on statistical analysis of selected communicable disease burden in school children and adolescents

Countries	Malaria	Diarrhoeal Diseases	LRTI	URTI	HIV	Other STIs
Liberia	44.95 (95%CI: 62.52,30.34)	1.08 (95%CI: 1.33,0.87)	0.11 (95%CI: 0.13,0.09)	3.22 (95%CI: 4.03,2.46)	0.16 (95%CI: 0.21,0.12)	4.66 (95%CI: 5.61,3.86)
Mali	13.84 (95%CI: 35.87,2.11)	1.34 (95%CI: 1.66,1.07)	0.08 (95%CI: 0.1,0.07)	2.56 (95%CI: 3.2,1.98)	0.13 (95%CI: 0.16,0.1)	4.27 (95%CI: 5.38,3.37)
Benin	38.23 (95%CI: 42.04,34.48)	1 (95%CI: 1.21,0.8)	0.1 (95%CI: 0.12,0.08)	2.81 (95%CI: 3.46,2.16)	0.18 (95%CI: 0.23,0.14)	3.01 (95%CI: 3.87,2.33)
Mauritania	9.4 (95%CI: 58.98,1.13)	1.56 (95%CI: 1.89,1.27)	0.11 (95%CI: 0.13,0.09)	2.96 (95%CI: 3.7,2.28)	0 (95%CI: 0.01,0)	3.93 (95%CI: 4.92,3.06)
Burkina Faso	36.25 (95%CI: 60.19,7.14)	1.25 (95%CI: 1.54,1)	0.11 (95%CI: 0.13,0.09)	3.04 (95%CI: 3.76,2.35)	0.15 (95%CI: 0.18,0.12)	3.65 (95%CI: 4.59,2.84)
Nigeria	22.67 (95%CI: 30.42,16.78)	1.14 (95%CI: 1.42,0.91)	0.1 (95%CI: 0.11,0.08)	3.07 (95%CI: 3.89,2.35)	0.14 (95%CI: 0.17,0.11)	3.04 (95%CI: 3.83,2.36)
Cameroon	25.16 (95%CI: 36.03,13.25)	1.19 (95%CI: 1.44,0.96)	0.1 (95%CI: 0.12,0.09)	3.78 (95%CI: 4.69,2.94)	0.48 (95%CI: 0.55,0.41)	4.98 (95%CI: 6.36,3.92)
Cape Verde	0.34 (95%CI: 1.39,0.09)	1.13 (95%CI: 1.43,0.88)	0.1 (95%CI: 0.12,0.08)	3.11 (95%CI: 3.87,2.41)	0.12 (95%CI: 0.21,0.07)	4.17 (95%CI: 5.26,3.28)
Sao Tome and Principe	1.36 (95%CI: 1.87,0.69)	1.16 (95%CI: 1.44,0.92)	0.13 (95%CI: 0.15,0.11)	2.93 (95%CI: 3.64,2.25)	0 (95%CI: 0,0)	3.87 (95%CI: 4.96,3.02)
Chad	10.06 (95%CI: 22.07,2.3)	1.65 (95%CI: 2.03,1.33)	0.15 (95%CI: 0.17,0.13)	3.17 (95%CI: 3.89,2.47)	0.2 (95%CI: 0.27,0.14)	3.22 (95%CI: 4.01,2.54)
Senegal	2.95 (95%CI: 8.73,0.73)	1.36 (95%CI: 1.62,1.14)	0.11 (95%CI: 0.13,0.09)	3 (95%CI: 3.74,2.29)	0.07 (95%CI: 0.09,0.06)	2.92 (95%CI: 3.7,2.29)

Review of school-based health and nutrition interventions in West Africa region

Cote D'Ivoire	34.03 (95%CI: 50.23,24.42)	1.14 (95%CI: 1.39,0.92)	0.12 (95%CI: 0.14,0.1)	3.28 (95%CI: 4.09,2.52)	0.51 (95%CI: 0.61,0.41)	3.43 (95%CI: 4.32,2.69)
Sierra Leone	40.86 (95%CI: 52.3,33.71)	1.25 (95%CI: 1.52,1.02)	0.13 (95%CI: 0.15,0.11)	2.47 (95%CI: 3.07,1.9)	0.24 (95%CI: 0.33,0.18)	3.75 (95%CI: 4.79,2.91)
Gambia	3.15 (95%CI: 8.55,0.75)	1.22 (95%CI: 1.48,0.98)	0.11 (95%CI: 0.13,0.09)	2.04 (95%CI: 2.53,1.54)	0.22 (95%CI: 0.32,0.13)	3.64 (95%CI: 4.63,2.88)
Togo	32.08 (95%CI: 35.41,27.9)	1.26 (95%CI: 1.54,1.01)	0.1 (95%CI: 0.11,0.08)	3.24 (95%CI: 4.02,2.5)	0.35 (95%CI: 0.44,0.26)	3.28 (95%CI: 4.16,2.57)
Niger	29.17 (95%CI: 44,13.9)	1.46 (95%CI: 1.79,1.18)	0.12 (95%CI: 0.14,0.1)	2.64 (95%CI: 3.29,2.04)	0.04 (95%CI: 0.06,0.03)	3.3 (95%CI: 4.24,2.55)
Guinea	35.78 (95%CI: 48.52,26.89)	1.27 (95%CI: 1.55,1.02)	0.14 (95%CI: 0.16,0.12)	2.82 (95%CI: 3.46,2.16)	0.2 (95%CI: 0.28,0.13)	3.53 (95%CI: 4.47,2.77)
Guinea Bissau	3.07 (95%CI: 9.26,0.7)	1.19 (95%CI: 1.43,0.96)	0.11 (95%CI: 0.13,0.09)	2.89 (95%CI: 3.61,2.22)	0.42 (95%CI: 0.64,0.23)	3.85 (95%CI: 4.77,3.03)
Ghana	23.44 (95%CI: 35.11,14.89)	0.98 (95%CI: 1.18,0.8)	0.1 (95%CI: 0.11,0.08)	2.91 (95%CI: 3.59,2.24)	0.25 (95%CI: 0.31,0.2)	4.51 (95%CI: 5.72,3.53)
West Africa	24.14 (95%CI: 29.26,20.44)	1.2 (95%CI: 1.45,0.97)	0.1 (95%CI: 0.12,0.09)	3.04 (95%CI: 3.77,2.34)	0.19 (95%CI: 0.21,0.17)	3.44 (95%CI: 4.28,2.75)

## Review of school-based health and nutrition interventions in West Africa region

Table 25: School-based WASH services in West Africa (% indicate proportion with no WASH services)

	% schools with no water service				% schools with no sanitation service				% schools with no hygiene service			
2019 Data	National	Pre-primary	Primary	Secondary	National	Pre-primary	Primary	Secondary	National	Pre-primary	Primary	Secondary
Benin	21	-	19	27	28	-	30	24	-	-	-	-
Burkina Faso	41	30	41	44	20	15	18	32	-	-	-	-
Cabo Verde	<1	-	<1	<1	1	-	<1	<1	-	-	-	-
Cameroon	36	39	43	-	49	-	54	-	-	-	-	-
Central African Republic	77	49	81	58	59	24	59	19	-	-	-	-
Chad	63	41	70	50	-	-	78	-	-	-	-	-
Côte d'Ivoire	50	40	56	14	50	50	53	6	73	50	76	-
Gambia	23	31	15	11	<1	-	<1	<1	-	-	-	-
Ghana	29	15	16	6	23	19	25	16	38	37	40	39
Guinea	67	15	65	-	18	22	22	6	68	-	68	-
Guinea-Bissau	35	-	-	-	47	-	-	-	75	-	-	-
Liberia	48	-	42	24	33	-	39	17	15	-	17	9
Mali	6	-	2	-	19	-	19	-	19	-	19	-
Mauritania	79	-	82	58	60	-	60	66	-	-	-	-
Niger	81	74	82	45	65	78	77	44	-	-	-	-
Nigeria	37	-	41	28	40	-	40	37	62	-	62	63
Sao Tome and Principe	15	39	10	5	16	15	15	11	10	-	12	<1
Senegal	23	63	26	5	19	42	18	10	72	-	72	-
Togo	57	-	65	49	-	-	-	-	-	-	-	-

**Table 26: Selected school health and nutrition policies**

Country	Policy Type	Document Title	Years	Brief Description	Link if Available
<b>Ghana</b>	Nutrition Policy	National Nutrition Policy For Ghana	2014 - 2017	Policy focuses on nutrition in Ghana as important to national development, providing guidelines for nutrition services and interventions, as well as providing sectoral support for its implementation	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/GHA%202013%20National%20Nutrition%20Policy.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/GHA%202013%20National%20Nutrition%20Policy.pdf</a>
	School Health Policy	Draft National School Feeding Policy	2015 -	Aim to improve the nutrition of children in public schools through the support of locally produced foods, with the aim to also improve the livelihoods of communities and the economy at large	<a href="https://www.mogcsp.gov.gh/?mdocs-file=670">https://www.mogcsp.gov.gh/?mdocs-file=670</a>
		Education sector HIV policy	2006-2010	The policy has been developed to: 1. Highlight the sector's commitment to the fight against the HIV/AIDS pandemic, 2. Provide guidelines and milestones that will ensure that all stakeholders tackle the problem of HIV/AIDS within the sector with a unified purpose	<a href="https://healtheducationresources.unesco.org/library/documents/ghanas-education-sector-hivaids-policy">https://healtheducationresources.unesco.org/library/documents/ghanas-education-sector-hivaids-policy</a>
<b>Nigeria</b>	Strategy	Nigeria Home Grown School Feeding Strategic Plan	2016 - 2020	Provides a framework for the implementation of the cost-effective Home Grown School Feeding (HGSF) programme in Nigeria. It emphasises on the contributions of local farmers to the programme and the local economy.	<a href="http://extwprlegs1.fao.org/docs/pdf/nig169078.pdf">http://extwprlegs1.fao.org/docs/pdf/nig169078.pdf</a>
	Strategy	Education for Change	2018 - 2022	The strategy provides details for education outcomes including providing nutrition support for school sports programmes	<a href="https://education.gov.ng/wp-content/uploads/2019/03/FINAL-UPDATED-MSP-WITH-COSTING.pdf">https://education.gov.ng/wp-content/uploads/2019/03/FINAL-UPDATED-MSP-WITH-COSTING.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

	Nutrition Policy	National Policy on Food and Nutrition in Nigeria	2016 - 2025	Aim at fostering multi-sectoral partnership to improve nutrition outcomes such as undernutrition, micronutrient deficiencies among vulnerable groups including infants, children and adolescents	<a href="https://nigeria.savethechildren.net/sites/nigeria.savethechildren.net/files/library/NPFN%20manual%20design%20%20v13.pdf">https://nigeria.savethechildren.net/sites/nigeria.savethechildren.net/files/library/NPFN%20manual%20design%20%20v13.pdf</a>
	Education sector policy	National education sector policy on HIV and AIDS	2003-2009	The goal of the revised National Policy on HIV/AIDS is to control the spread of HIV/AIDS in Nigeria and mitigate its social and economic impact.	<a href="https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/aids/documents/legaldocument/wcms_127570.pdf">https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/aids/documents/legaldocument/wcms_127570.pdf</a>
	Strategy	National Strategic Plan of Action for Nutrition	2014 - 2019	Provides guidance for the health sector component of the National Food and Security Policy. The plan focuses on vulnerable groups including children below the age of 5 years	<a href="https://extranet.who.int/nutrition/gina/en/node/23587">https://extranet.who.int/nutrition/gina/en/node/23587</a>
<b>The Gambia</b>	Nutrition Policy	National Nutrition Policy	2010 - 2020	Policy focuses on addressing problems related to Nutrition in Gambia. One of the aims of this policy includes improving the health and nutritional status of school-age children.	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/GMB%202010%20National%20Nutrition%20Policy.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/GMB%202010%20National%20Nutrition%20Policy.pdf</a>
	Strategy	Strategic Plan for Implementation of The National Nutrition Programme	2011 - 2015	The strategy provides details of the activities to be implemented to achieve the national policy objectives.	<a href="https://extranet.who.int/nutrition/gina/en/node/22859">https://extranet.who.int/nutrition/gina/en/node/22859</a>

Review of school-based health and nutrition interventions in West Africa region

	Education sector policy	National education sector policy for HIV and AIDS		The policy document seeks to: Prevent the spread of HIV/AIDS amongst education sector personnel and learners; provide and ensure the availability of care, support and voluntary counselling and testing (VCT) services to the education sector personnel and learners; and Provide protection from stigmatization and discrimination in both the workplace and educational institutions to sector personnel and learners respectively.	<a href="https://healtheducationresources.unesco.org/sites/default/files/resources/breda_gambia_hiv_and_aids_policy_for_education_sector.pdf">https://healtheducationresources.unesco.org/sites/default/files/resources/breda_gambia_hiv_and_aids_policy_for_education_sector.pdf</a>
<b>Sierra Leone</b>	Education Sector Plan	Education Sector Plan	2018 - 2020	Aims to improve education outcomes such as an increase in enrolment, school attendance, learning and retention, through an improved school feeding programme among public schools in Sierra Leone	<a href="https://www.globalpartnership.org/sites/default/files/sierra_leones_education_sector_plan_2018-2020.pdf">https://www.globalpartnership.org/sites/default/files/sierra_leones_education_sector_plan_2018-2020.pdf</a>
<b>Liberia</b>	Nutrition Policy	National Nutrition Policy	2008 -	The policy aims to improve the nutrition across over the life-course	<a href="http://liberiamohsw.org/Policies%20&amp;%20Plans/National%20Nutrition%20Policy.pdf">http://liberiamohsw.org/Policies%20&amp;%20Plans/National%20Nutrition%20Policy.pdf</a>
	Strategy	National Food Security and Nutrition Strategy	2008 -	The strategy supports the 'National Nutrition Policy', detailing guidelines for improving the nutrition of specific vulnerable groups including children from 0 - 5 years	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/LBR%202008%20National%20Food%20Security%20and%20Nutrition%20Strategy.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/LBR%202008%20National%20Food%20Security%20and%20Nutrition%20Strategy.pdf</a>
	Education Sector Plan	Getting to Best Education Sector Plan	2017 - 2021	Aims to reform many aspects of the education sector of Liberia, including improving school feeding and training on nutrition health safety to teachers and principals	<a href="https://www.globalpartnership.org/sites/default/files/getting_to_best_education_sector_plan_2017-2021._liberia.pdf">https://www.globalpartnership.org/sites/default/files/getting_to_best_education_sector_plan_2017-2021._liberia.pdf</a>
	Education sector	National educator sector HIV and AIDS policy	2010-2014	Guide interventions which prevent the spread of HIV & AIDS and other sexually transmitted infections (STIs)	<a href="https://healtheducationresources.unesco.org/sites/default/files/resources/breda_gambia_hiv_and_aids_policy_for_education_sector.pdf">https://healtheducationresources.unesco.org/sites/default/files/resources/breda_gambia_hiv_and_aids_policy_for_education_sector.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

				and protect, support and mitigate the social and economic impacts of HIV & AIDS on staff and learners in the Education sector.	<a href="http://multimedia.who.int/data/assets/pdf_document/20141027/9789241548224main.pdf">ult/files/resources/breda_l iberia_national_education_s ector_hiv_%26_aids_policy_2010_-2014.pdf</a>
<b>Mali</b>	School feeding	National School Feeding Policy	2009	Improve access to education, and educational outcomes through the provision of school meals.	WFP country strategy plan (2019-2023)
<b>Burkina Faso</b>	Nutrition policy	National policy on food security and nutrition	2013-2025	Aim at improving overall nutrition of vulnerable groups, malnutrition prevention and treatment for children	WFP country strategy plan (2019-2023)
<b>Senegal</b>	Education strategy	National strategy for improving quality, equity and access to basic education	2018-2030	Aim at improving learning outcomes in the initial primary school grades and improving equity in access to basic education in line with SDG 4.	WFP country strategy plan (2019-2023)
<b>Mauritania</b>	School feeding Strategy	National School meals strategy	2017	Envisages the roll-out of a national school feeding programme, making provision for home-grown school feeding.	WFP country strategy plan (2019-2023)
<b>Cote D'Ivoire</b>	Strategy	National social protection strategy for	2015–2020	To protect the most vulnerable groups through gender-responsive social safety nets.	WFP country strategy plan (2019-2023)
	Policy	National policy for school meals	2018–2025	Policy envisages that by 2025 all school-age children will be attending school and receiving nutritionally balanced daily hot meals.	WFP country strategy plan (2019-2023)
<b>Niger</b>	Policy	National Nutrition Security Policy	2016-2025)	Aim at eliminating all forms of malnutrition through a multi-sectorial, multi-partner approach combining nutrition-specific and -sensitive interventions.	WFP country strategy plan (2019-2023)
<b>Guinea Bissau</b>	Education Sector Plan	National education and health sector strategic and operational plan	2015–2025	Emphasizes the development of human capital through better education, health services and social protection	WFP country strategy plan (2019-2023)



Review of school-based health and nutrition interventions in West Africa region

<b>Benin</b>	Policy	Politique de lutte contre le VIH/sida et les IST en milieu scolaire  (Fight against HIV/aids and STIs in schools policy)	2006-2009	Ministry of secondary and primary education developed a policy to fight HIV and STIs in schools for teachers, students and other users. This is done by following the national strategy against HIV.	<a href="https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_125249.pdf">https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_125249.pdf</a>
	Strategy	Stratégie nationale multisectorielle de santé sexuelle et de la reproduction des adolescents et jeunes au Bénin  (National multi sectorial strategy on reproductive health of adolescents and young people)	2010-2020	Multi-sectorial strategy for the fight against HIV especially for young people. Document that provides support on interventions.	<a href="https://www.prb.org/wp-content/uploads/2018/05/Strate%CC%81gie-Nationale-Multisectorielle-de-Sante%CC%81-Sexuelle-et-de-la-Reproduction-des-Adolescents-et-jeunes-au-Be%CC%81nin-2010-2020.pdf">https://www.prb.org/wp-content/uploads/2018/05/Strate%CC%81gie-Nationale-Multisectorielle-de-Sante%CC%81-Sexuelle-et-de-la-Reproduction-des-Adolescents-et-jeunes-au-Be%CC%81nin-2010-2020.pdf</a>
	Policy	Politique du secteur santé pour la nutrition  (Policy of the health sector for nutrition)	2016-2025	Aims at improving health such as fighting against HIV through nutrition with a focus on mother, children, and young people. Provides guidelines for nutrition in schools.	<a href="http://extwprlegs1.fao.org/docs/pdf/Ben183998.pdf">http://extwprlegs1.fao.org/docs/pdf/Ben183998.pdf</a>
	Strategy	Stratégie nationale de communication pour le changement social et comportemental pour la promotion de la nutrition au Bénin et son plan opérationnel  (National strategy on communication for social change and behavior for the promotion of nutrition in	2017-2021	Strategy to promote education on nutrition as a way to reduce malnutrition especially amongst children.	<a href="https://pubdocs.worldbank.org/en/956571598893549127/TF0A2928-Strate%CC%81gie-nationale-de-CCSC-nutrition-et-plan-ope%CC%81rationnel-2017-a%CC%80-2021-au-20-de%CC%81c-16-version-finale-JTF-002.pdf">https://pubdocs.worldbank.org/en/956571598893549127/TF0A2928-Strate%CC%81gie-nationale-de-CCSC-nutrition-et-plan-ope%CC%81rationnel-2017-a%CC%80-2021-au-20-de%CC%81c-16-version-finale-JTF-002.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

		Benin and its operational plan)			
	Strategy	Plan stratégique de développement de l'alimentation et de la nutrition  (Strategy for the development of food supply and nutrition)	2009	Strategy to improve nutrition as well as water hygiene, which provides guidelines for schools.	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/BEN%202009%20Psdan_Panar_Part%20B_0.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/BEN%202009%20Psdan_Panar_Part%20B_0.pdf</a>
	Policy	Politique nationale de promotion de la santé  (National policy of health promotion)	2008	Policy as a reference for interventions to improve and promote health in Benin. It involves health promotion in schools and fight against HIV.	<a href="http://www.africanchildforum.org/clar/policy%20per%20country/benin/benin_healthpromn_fr.pdf">http://www.africanchildforum.org/clar/policy%20per%20country/benin/benin_healthpromn_fr.pdf</a>
	Strategy	Plan national de développement sanitaire  (National plan of sanitary development)	2018-2022	Strategy based on the national health policy. A priority is the fight against HIV for everyone and especially young people.	<a href="https://www.prb.org/wp-content/uploads/2020/06/Benin-Plan-National-de-D%C3%A9veloppement-Sanitaire-2018-2022.pdf">https://www.prb.org/wp-content/uploads/2020/06/Benin-Plan-National-de-D%C3%A9veloppement-Sanitaire-2018-2022.pdf</a>
	Policy	Politique nationale de la santé communautaire  (National policy of community health)	2015	Policy aiming at improving health through improving communities' responses to health issues.	<a href="https://www.usaid.gov/sites/default/files/documents/1860/Annex%201%20-%20Politique_Sant_com_finale_Finale.pdf">https://www.usaid.gov/sites/default/files/documents/1860/Annex%201%20-%20Politique_Sant_com_finale_Finale.pdf</a>
	Statute	LOI n° 2003-17 portant Orientation de l'Education Nationale en République du Bénin  (Statute on national education)	2003	Statute confirming the Constitution with the fact that Education is the first national priority in Benin with a public and secular school system.	<a href="http://www.unesco.org/education/edurights/media/docs/a244de65e69a2204a88fd68a9c43694f2ed04564.pdf">http://www.unesco.org/education/edurights/media/docs/a244de65e69a2204a88fd68a9c43694f2ed04564.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

	Strategy	Stratégie nationale de promotion de l'hygiène et l'assainissement de base (SNPHAB) en milieu rural au Bénin  (National strategy of hygiene promotion in rural areas)	2018-2030	WASH and hygiene promotion in rural areas of Benin such as in schools.	<a href="https://www.pseau.org/outils/ouvrages/strategie_nationale_de_promotion_de_l_hygiene_et_de_l_assainissement_de_base_en_milieu_rural_au_benin_2018_2030_2018.pdf">https://www.pseau.org/outils/ouvrages/strategie_nationale_de_promotion_de_l_hygiene_et_de_l_assainissement_de_base_en_milieu_rural_au_benin_2018_2030_2018.pdf</a>
	Toolkit/Strategy	L'eau, l'hygiène et l'assainissement (WASH) en milieu scolaire  (WASH in schools)	2014	WASH strategy with several activities and guidelines for schools.	<a href="https://knowledge.uclga.org/IMG/pdf/leaulhygieneetlassainissementenmilieuscolaire.pdf">https://knowledge.uclga.org/IMG/pdf/leaulhygieneetlassainissementenmilieuscolaire.pdf</a>
<b>Central African Republic</b>	Strategy	Cadre stratégique national de lutte contre le VIH et le sida  (National strategy on fighting HIV and aids)	2012-2016	Strategy to fight new infections, improve access to health for those already infected, and reinforce the fight against HIV.	<a href="https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_301805.pdf">https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_301805.pdf</a>
	Strategy	Stratégie cluster education	2019-2021	Strategy that aims to improve the country through education such as improving nutrition in schools and educating on the fight against HIV, and the promotion of WASH.	<a href="https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/strategie_eie_cluster_education_rca.pdf">https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/strategie_eie_cluster_education_rca.pdf</a>
	Policy	Politique nationale de nutrition  (National nutrition policy)	2013	Aim is to reduce malnutrition at every level through promotion, prevention and healing. One of its priority is the distribution of micro-nutrients in schools. Also, to fight HIV for everyone and also in schools.	<a href="https://extranet.who.int/nutrition/gina/sites/default/files/esstore/RCA-2013-PNN.pdf">https://extranet.who.int/nutrition/gina/sites/default/files/esstore/RCA-2013-PNN.pdf</a>
	Strategy	Plan de transition	2014-2017	The transition plan was implemented as a response to the crisis. It involves guidelines and information on improving nutrition in schools.	<a href="https://www.globalpartnership.org/sites/default/files/a-car-education_transitional_pla">https://www.globalpartnership.org/sites/default/files/a-car-education_transitional_pla</a>

Review of school-based health and nutrition interventions in West Africa region

					<a href="#">n- september 2014 - french_0.pdf</a>
	Strategy	Stratégie nationale du secteur de l'éducation  (National strategy on education)	2008-2020	National strategy to improve education.	<a href="http://www.unesco.org/education/edurights/media/docs/53b2735447e04813c998b5cb58fc3bc17bf59e2c.pdf">http://www.unesco.org/education/edurights/media/docs/53b2735447e04813c998b5cb58fc3bc17bf59e2c.pdf</a>
	Strategy	Plan de transition du secteur santé en République Centrafricaine  (Transition plan of the health sector)	2015-2017	Strategy to respond to the socio-economic crisis to urgently respond to the health demands of the population. One of the specific aims is to improve mother and children health especially regarding HIV.	<a href="https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/central_african_republic/rca_ptss_revise_final_26092016.pdf">https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/central_african_republic/rca_ptss_revise_final_26092016.pdf</a>
	Strategy	Plan national de développement sanitaire  (National plan of sanitary development)	2006-2015	Strategy to implement the national health policy. Includes guidelines to fight HIV.	<a href="https://www.prb.org/wp-content/uploads/2020/06/RCA-Plan-National-de-Developpement-Sanitaire-2006-2015.pdf">https://www.prb.org/wp-content/uploads/2020/06/RCA-Plan-National-de-Developpement-Sanitaire-2006-2015.pdf</a>
	Strategy	Plan sectoriel de l'éducation  (Sectorial plan of education)	2020-2029	Strategy to improve education as the country's future is linked to it. Specifically, the improvement of nutrition and WASH in schools. Moreover, education children on HIV.	<a href="http://documents1.worldbank.org/curated/en/891981593669171779/text/R%C3%A9publique-Centrafricaine-Plan-Sectoriel-de-l-Education-2020-2029.txt">http://documents1.worldbank.org/curated/en/891981593669171779/text/R%C3%A9publique-Centrafricaine-Plan-Sectoriel-de-l-Education-2020-2029.txt</a>
	Strategy	Stratégie eau, hygiène et assainissement en milieu scolaire en situation d'urgence  (WASH strategy for urgency in schools)	2017	Strategy to implement WASH in schools for urgent situations.	<a href="https://reliefweb.int/sites/reliefweb.int/files/resources/170816%20CSO%20-%20EHA%20-%20Strategie%20-%20WINS.pdf">https://reliefweb.int/sites/reliefweb.int/files/resources/170816%20CSO%20-%20EHA%20-%20Strategie%20-%20WINS.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

<b>Togo</b>	Policy	Politique institutionnelle en matière de VIH/SIDA dans les universités du Togo  (Institutional policy on HIV/AIDS in universities)	2004	Policy in universities. Aim is to reduce transmission within the community as well as promoting research, education and testing.	<a href="https://www.adeanet.org/clearinghouse/sites/default/files/docs/he_udtogo.pdf">https://www.adeanet.org/clearinghouse/sites/default/files/docs/he_udtogo.pdf</a>
	Strategy	Plan stratégique national de lutte contre le VIH et le Sida  (National strategy on fighting HIV and aids)	2021-2025	Aims to provide the population with prevention, treatment and support services against HIV.	<a href="https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/111030/138290/F1682757184/TGO-111030.pdf">https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/111030/138290/F1682757184/TGO-111030.pdf</a>
	Statute	LOI N° 2020-007 relative à l'alimentation scolaire  (Statute relating to school feeding)	2020	Statute that aims to guarantee school feeding for every student and especially for rural areas.	<a href="http://extwprlegs1.fao.org/docs/pdf/tog197390.pdf">http://extwprlegs1.fao.org/docs/pdf/tog197390.pdf</a>
	Policy	Politique nationale en matière d'alimentation et de nutrition  (National policy on feeding and nutrition)	2010	Strategies and activities to reduce malnutrition and obesity especially for women and children.	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/TGO%202010%20POLITIQUE%20NUTRITION.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/TGO%202010%20POLITIQUE%20NUTRITION.pdf</a>
	Strategy	Plan stratégique national d'alimentation et de nutrition  (National strategy on feeding and nutrition)	2012-2015	Strategy focuses on promoting nutrition, educating on nutrition and fighting malnutrition.	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/PSNAN_Avril-Mai2012_Atelier_Validation.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/PSNAN_Avril-Mai2012_Atelier_Validation.pdf</a>
	Strategy	Plan stratégique pour la santé des adolescents et des jeunes au Togo  (Strategy on adolescents and young people's health)	2008-2012	Aims to improve young people and adolescent's health on the main health issues such as HIV through education and health services and support.	<a href="https://www.prb.org/wp-content/uploads/2018/04/Plan-Strate%CC%81gique-2008-2012-pour-la-Sante%CC%81-des-Adolescents-et-leunes-au-Togo.pdf">https://www.prb.org/wp-content/uploads/2018/04/Plan-Strate%CC%81gique-2008-2012-pour-la-Sante%CC%81-des-Adolescents-et-leunes-au-Togo.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

	Strategy	Plan national de développement sanitaire (National plan of sanitary development)	2017-2022	Main axes are on the reduction of maternal and youth mortality, fight against communicable and chronic diseases, improvement of the sanitary safety and improvement of the health sector.	<a href="http://extwprlegs1.fao.org/docs/pdf/Tog184007.pdf">http://extwprlegs1.fao.org/docs/pdf/Tog184007.pdf</a>
	Policy	Politique nationale de santé (National Health Policy)	2019	National health policy to improve the health sector through reforming the formation of health practitioners. One of the priorities being to fight the HIV.	<a href="https://sante.gouv.tg/node/573">https://sante.gouv.tg/node/573</a>
	Strategy	Visites médicales systématiques dans les établissements scolaires du Togo (Medical visits in schools)	2019	Aims to provide medical visits for all schools to check on students' health.	<a href="https://wahooas.org/web-ooas/sites/default/files/publications/1977/procedures-de-visites-medicales-systematiques-dans-les-etablissements-scolaires-du-togo_2.pdf">https://wahooas.org/web-ooas/sites/default/files/publications/1977/procedures-de-visites-medicales-systematiques-dans-les-etablissements-scolaires-du-togo_2.pdf</a>
	Strategy	Plan sectoriel de l'éducation (Sectorial plan of education)	2014-2025	Strategy to improve access to education, equity and the quality of education. One axis is the HIV prevention. Also, support on nutrition.	<a href="https://www.globalpartnership.org/sites/default/files/2015_02_togo_education_sector_plan_fr_1.pdf">https://www.globalpartnership.org/sites/default/files/2015_02_togo_education_sector_plan_fr_1.pdf</a>
<b>Chad</b>	Policy	Politique nationale de nutrition et d'alimentation (National nutrition and feeding policy)	2014-2025	Aims at re-enforcing multi-sectorial interventions, devolving interventions and means, implications of authorities and a priority on strategies against malnutrition.  One of the objectives focuses on school nutrition in order to improve it and educate on it.	<a href="http://scalingupnutrition.org/wp-content/uploads/2013/11/Politique-Nationale-de-Nutrition-et-dAlimentation-du-Tchad-Version_corrige%C3%A9e_Finale-doc.pdf">http://scalingupnutrition.org/wp-content/uploads/2013/11/Politique-Nationale-de-Nutrition-et-dAlimentation-du-Tchad-Version_corrige%C3%A9e_Finale-doc.pdf</a>
	Stratégie	Note de stratégie de programme CSD-Tchad (Santé, Nutrition, VIH, WASH)	2017-2021	UNICEF plan focusing on WASH, HIV, nutrition and health for children.	<a href="http://files.unicef.org/transparency/documents/Chad%20Note%20de%20Strategie">http://files.unicef.org/transparency/documents/Chad%20Note%20de%20Strategie</a>

Review of school-based health and nutrition interventions in West Africa region

		(Strategy notes on program CSD-Tchad)			<a href="#">%20de%20Progamme%20S urvie%20-%2016%20mai%202016.pdf</a>
	Strategy	Plan stratégique national de riposte au sida  (HIV national strategy)	2012-2015	Provides guidelines on how to fight HIV through reducing vulnerability of certain groups, prevention in communities and health sectors, care of people infected and further research and surveillance.	<a href="https://healtheducationresources.unesco.org/sites/default/files/resources/plan_strategique_national_de_rioste_au_vih-sida_2012-2015.pdf">https://healtheducationresources.unesco.org/sites/default/files/resources/plan_strategique_national_de_rioste_au_vih-sida_2012-2015.pdf</a>
	Statute	Loi n° 019/PR/2007 portant lutte contre le VIH/SIDA/IST et protection des droits des personnes vivant avec le VIH/SIDA.  (HIV statute)	2007	Statute on the fight against HIV as well as the protection of peoples' rights for those living with HIV.	<a href="http://ilo.org/dyn/natlex/natlex4.detail?p_lang=fr&amp;p_isn=79408&amp;p_count=96912#:~:text=Nom%3A,vivant%20avec%20le%20VIH%2FSIDA.&amp;text=Contient%20notamment%20des%20dispositions%20relatives,travail%20e t%20%C3%A0%20la%20confidentialit%C3%A9">http://ilo.org/dyn/natlex/natlex4.detail?p_lang=fr&amp;p_isn=79408&amp;p_count=96912#:~:text=Nom%3A,vivant%20avec%20le%20VIH%2FSIDA.&amp;text=Contient%20notamment%20des%20dispositions%20relatives,travail%20e t%20%C3%A0%20la%20confidentialit%C3%A9</a>
	Policy	Politique nationale de santé  (National health policy)	2016-2030	National health policy. Mentions guidelines on how to reduce HIV prevalence, as well as school health.	<a href="https://www.prb.org/wp-content/uploads/2020/06/Tchad-Politique-Nationale-de-Sante-2016-2030.pdf">https://www.prb.org/wp-content/uploads/2020/06/Tchad-Politique-Nationale-de-Sante-2016-2030.pdf</a>
	Strategy	Plan national de développement sanitaire  (National plan of sanitary development)	2018-2021	This plan focuses on a multi-sectorial approach for every level of health service including in schools and on the fight against HIV.	<a href="https://www.prb.org/wp-content/uploads/2020/06/Tchad-Plan-National-de-Developpement-Sanitaire-2018-2021.pdf">https://www.prb.org/wp-content/uploads/2020/06/Tchad-Plan-National-de-Developpement-Sanitaire-2018-2021.pdf</a>
	Strategy	WASH in nutrition - stratégie Tchad	2017	National strategy for the implementation of WASH for all communities	<a href="https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/fil">https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/fil</a>

Review of school-based health and nutrition interventions in West Africa region

					<a href="https://documents/files/20171214_washinnutstrat.pdf">es/documents/files/20171214_washinnutstrat.pdf</a>
	Strategy	Stratégie sectorielle Eau, Hygiène et Assainissement (EHA)  (WASH strategy)	2016-2018	Strategy to maintain a healthy and clean environment through WASH in several places such as schools.	<a href="https://www.unhcr.org/fr/570644b76.pdf">https://www.unhcr.org/fr/570644b76.pdf</a>
	Strategy	Stratégie nationale de l'eau, de l'assainissement et de l'hygiène en milieu scolaire  (National WASH strategy in schools)	2018-2030	WASH strategy in schools	<a href="http://extwprlegs1.fao.org/docs/pdf/Cha188162.pdf">http://extwprlegs1.fao.org/docs/pdf/Cha188162.pdf</a>
	Strategy	Plan intérimaire de l'éducation au Tchad  (Interim education strategy)	2018-2020	Strategy to develop education in Chad. Some of the guidelines include the improvement of school health and nutrition such as school feeding plans.	<a href="https://www.globalpartnership.org/sites/default/files/plan_interiminaire_de_leducation_au_tchad_piet_2018-2020.pdf">https://www.globalpartnership.org/sites/default/files/plan_interiminaire_de_leducation_au_tchad_piet_2018-2020.pdf</a>
<b>Guinea</b>	Policy	Politique nationale d'alimentation - nutrition  (National feeding and nutrition policy)	2014-	Policy to fight malnutrition and illnesses that come from it.	<a href="https://extranet.who.int/nutrition/gina/sites/default/filesstore/GIN%202014%20Politique%20Nationale%20Nutrition.pdf">https://extranet.who.int/nutrition/gina/sites/default/filesstore/GIN%202014%20Politique%20Nationale%20Nutrition.pdf</a>
	Strategy	Plan stratégique national de la santé maternelle, du nouveau-né, de l'enfant, de l'adolescent et des jeunes (SRMNIA)  (National strategy on maternal health and young people and adolescents' health)	2016-2020	Strategy to improve health of new borns, children and adolescents. It includes the HIV fight	<a href="https://www.prb.org/wp-content/uploads/2018/05/Plan-Strate%CC%81gique-National-de-la-Sante%CC%81-Maternelle-du-Nouveau-ne%CC%81-de-l%20%99Enfant-de-l%20%99Adolescent-et-">https://www.prb.org/wp-content/uploads/2018/05/Plan-Strate%CC%81gique-National-de-la-Sante%CC%81-Maternelle-du-Nouveau-ne%CC%81-de-l%20%99Enfant-de-l%20%99Adolescent-et-</a>



Review of school-based health and nutrition interventions in West Africa region

					<a href="#">des-leunes-2016-2020.-Guine%CC%81e.pdf</a>
	Policy	Politique nationale de la santé communautaire  (National policy of community health)	2012-	This policy should be used as a support for health interventions in the community	<a href="http://cnls-guineeconakry.org/wp-content/uploads/2019/09/document_de_politique_sant_e_communautaire.pdf">http://cnls-guineeconakry.org/wp-content/uploads/2019/09/document_de_politique_sant_e_communautaire.pdf</a>
	Policy	Politique nationale de santé  (National health policy)	2014-2024	Policy to apply the constitutional law of health in Guinea. Done through reduction of mortality and morbidity from diseases, improve health for every age and improve the health system. Mentions fight against HIV.	<a href="https://www.invest.gov.gn/document/politique-nationale-de-sante">https://www.invest.gov.gn/document/politique-nationale-de-sante</a>
	Strategy	Plan national de développement sanitaire  (National plan of sanitary development)	2015-2024	Strategy produced to operate the national health policy through the promotion of children and mothers' health, and improvement of health services. Provides guidelines on activities done in schools for the fight of HIV.	<a href="https://www.prb.org/wp-content/uploads/2018/05/Plan-National-de-De%CC%81veloppement-Sanitaire-2015-2024.-Guine%CC%81e.pdf">https://www.prb.org/wp-content/uploads/2018/05/Plan-National-de-De%CC%81veloppement-Sanitaire-2015-2024.-Guine%CC%81e.pdf</a>
	Strategy	Stratégie nationale de l'hygiène publique  (National public hygiene strategy)	2013	Strategy focused on water health to reduce illnesses. Mentions specifically WASH in schools.	PDF
	Strategy	Cadre stratégique national de lutte contre le sida  (National HIV fight strategy)	2018-2022	Strategy aims at a national access to treatment and prevention. One measure being the teaching in schools.	<a href="http://cnls-guineeconakry.org/wp-content/uploads/2019/09/Cadre-Strat%C3%A9gique-National-de-lutte-contre-le-Sida-2018-2022.pdf">http://cnls-guineeconakry.org/wp-content/uploads/2019/09/Cadre-Strat%C3%A9gique-National-de-lutte-contre-le-Sida-2018-2022.pdf</a>

Review of school-based health and nutrition interventions in West Africa region

	Strategy	Programme décennal pour l'éducation en Guinée  (10 year program for education)	2020-2029	10- year plan for promotion quality of education for students. This will be done through many guidelines, one of them being improving school feeding options. As well as school health guidelines.	<a href="https://www.globalpartnership.org/sites/default/files/document/file/2020-Guinea-ESP.pdf">https://www.globalpartnership.org/sites/default/files/document/file/2020-Guinea-ESP.pdf</a>
<b>Cameroon</b>	Strategy	Plan stratégique national de lutte contre le VIH, le Sida et les IST.  (National strategy on fighting HIV, aids and STIs).	2018-2022	Strategy funded from the sectorial health strategy 2016-2027. Aims to reduce HIV-related morbidity and mortality and to curb the socio-economic burden of the disease on the country's Development. Provides strategies in schools.	<a href="http://cdnss.minsante.cm/sites/default/files/rPLAN%20STRATEGIQUE%20NATIONL%20VIH%202018-2022_FINAL.pdf">http://cdnss.minsante.cm/sites/default/files/rPLAN%20STRATEGIQUE%20NATIONL%20VIH%202018-2022_FINAL.pdf</a>
	Strategy	Stratégie sectorielle de santé  (Sectorial health strategy)	2016-2027	Strategy to promote health in the population. Guidelines include the water health, HIV fight, and the school community health and nutrition.	<a href="https://info.undp.org/docs/pdc/Documents/CMR/strat%C3%A9gie%20Sant%C3%A9.pdf">https://info.undp.org/docs/pdc/Documents/CMR/strat%C3%A9gie%20Sant%C3%A9.pdf</a>
	Strategy	Plan national de développement sanitaire  (National plan of sanitary development)	2016-2020	To put in action the Sectorial health strategy through the improvement of the health sector, the control of communicable (such as HIV) and non-communicable diseases, and interventions for maternal, young and adolescent health. One priority is the improvement of nutrition.	<a href="https://www.minsante.cm/site/?q=fr/content/plan-national-de-d%C3%A9veloppement-sanitaire-pnds-2016-2020">https://www.minsante.cm/site/?q=fr/content/plan-national-de-d%C3%A9veloppement-sanitaire-pnds-2016-2020</a>
	Strategy	Stratégie nationale de promotion de l'approvisionnement en eau potable, l'hygiène et l'assainissement en milieu scolaire au Cameroun  (National WASH strategy in schools)	2017	The aim of this strategy is to provide Cameroon with a national plan for the promotion of drinking water, health and safety of the water in schools.	<a href="http://extwprlegs1.fao.org/docs/pdf/cmr197627.pdf">http://extwprlegs1.fao.org/docs/pdf/cmr197627.pdf</a>
	Policy	Politique nationale d'alimentation et de nutrition	2015-2035	Aims at improving nutrition at different levels such as young children vulnerable to HIV as well as in schools.	<a href="https://extranet.who.int/nutrition/gina/sites/default/fil">https://extranet.who.int/nutrition/gina/sites/default/fil</a>

Review of school-based health and nutrition interventions in West Africa region

		(National feeding and nutrition policy)		Moreover, one pillar is WASH policies for improving nutrition and health.	<a href="#">esstore/CMR%202015%20P NAN.pdf</a>
	Strategy	Plan stratégique national de la santé des adolescents et des jeunes au Cameroun  (Adolescent and young people health strategy)	2015-2019	Support document for further actions on improving health of young people especially in regards to HIV.	<a href="https://www.prb.org/wp-content/uploads/2020/06/Cameroun-Plan-Strategique-National-de-la-Sante-des-Adolescents-et-de-jeunes-2015-19.pdf">https://www.prb.org/wp-content/uploads/2020/06/Cameroun-Plan-Strategique-National-de-la-Sante-des-Adolescents-et-de-jeunes-2015-19.pdf</a>
	Strategy	Document de stratégie du secteur de l'éducation et de la formation  (Education strategy)	2013-2020	Strategy to improve education in schools and university through quality teaching, access, equality and equity. One of the guidelines focuses on adequate support for people with HIV. Another guideline is on the improvement on nutrition through school feeding.	<a href="http://www.unesco.org/education/edurights/media/docs/b8a0ab0d1616d00eb4f5d661b7a9c676c91e5449.pdf">http://www.unesco.org/education/edurights/media/docs/b8a0ab0d1616d00eb4f5d661b7a9c676c91e5449.pdf</a>

