

Field Exchange

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Emergency Nutrition Network

Special Issue Nutrition of adolescents and school-aged children

Emergency Nutrition Network
in collaboration with UNICEF
and the Adolescent Nutrition
Interest group

ENN
25
YEARS
1996 – 2021



Celebrating
twenty-five
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nutrition



Contents



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Students outside their classroom at Dima Guranda Primary School in Sebeta District in Oromia Region of Ethiopia

3 Editorial

News

- 4 What's new for adolescent nutrition in the DHS Program
- 4 Conducting formative research on adolescent nutrition: Key considerations
- 5 Global launch: 'Making Every School a Health Promoting School' initiative
- 5 Research consortium for school health and nutrition: Launch
- 6 Adolescent nutrition and anaemia course
- 6 The "Adolescent Nutrition Resource Bank": Practical resources for improving adolescent nutrition programmes
- 7 MMS on Essential Medicine List
- 7 Expanding youth engagement in health research: The Lancet Youth Advisory Panel

Views

- 8 Systems approach to prevent all forms of malnutrition among children 5-19 years
- 10 Non-nutrition interventions to prevent anaemia in school-age children and adolescents
- 12 The importance of school feeding programmes to support the nutrition of school-age children, particularly during the COVID-19 pandemic
- 15 25 years of Field Exchange: has it made a difference?

Field Articles

- 16 Experiences from implementation of a school-based nutrition programme in Wakiso District, Central Uganda.
- 20 Promoting youth leadership on nutrition through junior parliamentarians and junior council engagement in Zimbabwe
- 23 Improving adolescents' food choices: Learnings from the Bhalo Khabo Bhalo Thakbo ("Eat Well, Live Well") campaign in Bangladesh
- 26 Adolescent Girl Power Groups in Bangladesh: Placing gender equality at the centre of nutrition interventions
- 30 An integrated multi-sector approach to improve the nutritional status among school-age children and adolescents in Malawi
- 33 Preventing teen pregnancies and supporting pregnant teenagers in Ecuador
- 36 "I'm courageous": a social entrepreneurship programme promoting a healthy diet in young Indonesian people
- 40 Weekly iron and folic acid supplementation and nutrition education for adolescent girls in Africa and Asia

- 44 'Vida Saludable': Healthy living is on the school curriculum in Mexico
- 47 Improving the nutritional well-being of school-age children through the Nutrition-Friendly Schools Initiative (NFSI) in the State of Palestine
- 51 Use of media to engage school-age children and adolescents to improve their nutrition and health
- 53 Case Study 1: Assessing effectiveness of an interactive magazine aimed at influencing nutrition behaviours among school-attending adolescents in Timor-Leste
- 54 Case Study 2: Pacific Kids Food Revolution (PKFR): The innovative way teenagers are leading the way in the Pacific Islands to improve nutrition
- 55 Case Study 3: Improving eating habits in India: The Eat Right School programme
- 56 Case Study 4: Digital solutions developed by youth to drive social behaviour change for nutrition in Zimbabwe

Research Snapshots

- 57 COVID-19 pandemic impacts on adolescents' lives in sub-Saharan Africa
- 57 Dietary intake and practices of adolescent girls in low and middle-income countries: A systematic review
- 58 Intergenerational nutrition benefits of India's national school feeding programme
- 58 The triple burden of malnutrition among adolescents in Indonesia
- 59 Food systems for children and adolescents
- 59 Addressing knowledge gaps in adolescent nutrition
- 60 Family influences on practices of pregnant adolescents in Bangladesh
- 60 Determinates of dietary intake among adolescents in Bangladesh

Research Summaries

- 61 TALENT Collaboration: Exploring adolescent diet and physical activity in India and sub-Saharan Africa
- 63 Capturing nutrition data for school-age children and adolescents

- 64 Anthropometric assessment of nutritional status in school-aged children and adolescents
- 66 Current evidence on anaemia and micronutrient supplementation strategies in school-age children and adolescents

Research

- 68 Determinants of adolescent nutritional status and practices in Burkina Faso: A pooled secondary analysis
- 72 Diet and nutrition status among school-age children and adolescents in Tanzania
- 76 Risk of nutritional deficiencies increases during female adolescence: A comparison of the cost of a nutritious diet across sex and age

Report Summaries

- 81 Early is best but it is not always too late. Young Lives evidence on nutrition and growth in Ethiopia, India, Peru and Vietnam
- 82 Growth through Nutrition: The adolescent nutrition SBCC programme in Ethiopia
- 83 Fix my food: Children's views on transforming food systems
- 84 Scoping review on school food and nutrition policies
- 84 Investing in the now and the future: Why governments should commit to adolescent health and nutrition
- 85 When are we going to teach health?
- 86 Nutrition and health challenges for Rohingya and Bangladeshi adolescents and the impacts of the COVID-19 pandemic
- 87 New UNICEF resource: Programming guidance for parenting of adolescents
- 87 UNICEF programming guidance: Nutrition in middle childhood and adolescence
- 88 People-driven SBC in practice combating stunting in Indonesia





Dear readers,

Welcome to the 66th edition of Field Exchange, which we are delighted to announce is a special issue focusing on adolescents and school-aged children. The importance of investing in this age group is backed up by evidence and science; for building life-long health and maximising both their potential and that of future generations, and also because of their key contribution to meeting the global Sustainable Development Goals. Improving the nutrition of adolescents and school-aged children is a topic that ENN is passionate about. We've been slowly building information and evidence over the past few years as part of the Adolescent Nutrition Interest Group¹, an informal group coordinated by ENN. We're very excited to produce this special edition, to summarise latest research and showcase innovative projects. It has been particularly interesting to have engaged with so many authors on what is happening for this age group in the nutrition sector, the many challenges that exist and what the priorities are moving forwards. Of course, the COVID-19 pandemic continues to be a focus across Field Exchange and its impact on efforts towards improving the nutrition status of adolescents and school-aged children is outlined in almost every article included in this edition.

A key challenge that has been highlighted is the lack of international targets and goals for adolescents and school-aged children, in addition to limited systematic tracking of nutrition and mortality data. This is partly due to the wide variety of indicators used, the different age groups targeted and multiple references used for each, as outlined by **Lelijveld** (p64) in a research summary. These data gaps mean that it is difficult to assess the burden of malnutrition in this age group, to monitor trends over time and to assess the impact of strategies and interventions. The lack of data constrains decision-making, prioritisation and advocacy with governments. However, a news piece by **Rukundo Benedict** (p4) describes some positive improvements that are on the way in Demographic and Health Surveys (DHS), including the use of BMI-for-age z-scores to help assess adolescent nutritional status and the addition of several new nutrition-related indicators. Although DHS only collects data for the 15-19 year old age group and therefore gaps remain for 5-14 year olds, this is a good start in helping the right data to be collected and utilised to advocate for the needs of adolescents and school-aged children, and hopefully for programmes to better track impact in the future.

Schools remain a critical delivery platform for health and nutrition interventions for adolescents and school-age children, as highlighted by **Bhutta** et al in the 2021 Lancet Maternal and Child Undernutrition series update.² A views article by **Bouterakos** et al (p12) describes the importance of school feeding programmes; ever more important given the number of children who were out-of-school for so long due to the COVID-19 pandemic. The urgency of encouraging attendance once again, both for education reasons and to increase access to health and nutrition interventions, cannot be overstated. Not only is school feeding important for the learners themselves, when intergenerational effects are considered, the linear growth benefits of school feeding for children six to 10 years of age are

much greater than previously understood. This was outlined by **Chakrabarti** et al (p58) when describing the success of India's Mid-Day Meal scheme. The value of school-based programming is also described by **Hemler** et al (p66) when summarising the current evidence on anaemia in school-age children and adolescents. Here, multiple micronutrient supplements offer an avenue for success but many questions remain around how to reach those out-of-school. Nevertheless, while there are still gaps in evidence on the best way to address adolescent and school-age nutrition through school and community platforms, we do already know enough to start intervening at greater scale now. In addition, few articles discuss the challenge of how to best reach and support out-of-school adolescents and school-aged children. An increased focus is needed on those who are not in school long-term, who are hardest to reach but likely furthest behind and who are the greatest risk for both their own development and that of future generations.

The importance of well-functioning food systems for both individual and planetary health has been gaining traction over the past few years. It is encouraging to see a number of articles in this edition focus on the importance of food systems and food environments for adolescents' nutrition. **Matonga** et al (p30) highlight the value of food systems in the nutrition-sensitive agricultural arm of their intervention and the article from **Mexico** (p44) highlights how behaviour change initiatives, no matter how successful, can only go so far if obesogenic environments limit access to and availability of nutritious diets. In **Gaza** (p47) it was noted how hostilities negatively affected food security of adolescents and school-aged children, highlighting the importance of strengthening food systems within protracted conflicts, which are sadly becoming more prevalent across the globe. Finally, the cost of the diet analysis conducted by **Turowska** et al (p72), looking at the differences between dietary needs of adult men and adolescent girls (in order to look at the cost and affordability of meeting adolescent girls' nutrient needs relative to those of other household members, to estimate the comparative risk of nutritional deficiencies), describes how nutritious diets are largely inaccessible for the poorest communities. They suggest that a focus on local production and gearing food systems towards nutrient diverse foods, such as beans and legumes, could help to safeguard the health of vulnerable adolescents, particularly young girls. However, as **Sharma** and **Tyler** (p8) outline in their views piece, a holistic, multisectoral systems approach should be taken to effectively address the drivers and determinants of malnutrition in this age group, one that goes beyond food systems to also include health, education, water and sanitation, and social protection systems.

Another theme that came through strongly in this edition was the importance of ensuring that the youth themselves lead on designing and implementing programmes and projects intended to address the challenges they face, in order to create 'youth-friendly' interventions. For example, in Zimbabwe, **Katete** et al (p20), demonstrated how young people can be champions of change at their schools amongst peers, in the spirit of 'for young people, by young people'. More and more, media is being used to reach this age group as we progress through the digital age and innovative case studies are presented from Timor Leste, the

Pacific Islands, India and Zimbabwe in **Wrottesley's** article (p51) on the use of media to engage school-aged children and adolescents to improve their nutrition and health status.

While much promising work has been done to develop policies and guidelines and to advocate for prioritising these age groups, a common theme across all field experiences described, due to the lack of agreed metrics and indicators for this age group, is that it is difficult to determine impact as a result. Many projects struggle to capture impact data related to their interventions, even where key stakeholders see the value in prioritising adolescent and school-aged children and are mobilised to respond. This particular challenge highlights the role that UN organisations, such as UNICEF, can have in supporting governments and partners to monitor the impact of programmes. One example of this is in **Mexico** (p44), where UNICEF is supporting the government to develop appropriate monitoring and evaluation for the 'Vida Saludable' programme to better track progress and impact on the nutritional status of adolescents and school-aged children. Only with effective monitoring and improved evaluation can we hope to assess impact and thus better serve this critical age group.

Despite a public announcement calling for content for this edition, very little was received for school-aged children, in particular the period of middle childhood (aged 5-9 years). We anticipated that this may be the case but it is a sobering reminder of the little we know about this age group, both in terms of their nutritional status and what interventions can be effective in improving it. Identifying agreed evidence gaps and priorities for research for both in- and out-of-school adolescents is critical for mobilising attention and financing and this will be helped by a series of papers from the influential Lancet journal that will be released imminently regarding adolescent nutrition; we're eagerly awaiting the excellent summaries of latest evidence, interventions and recommendations. Additionally, ENN will shortly finalise and publish a research prioritisation exercise for the nutrition of school-aged children and adolescents using the CHNRI methodology, so watch this space!

Finally, this 66th edition of Field Exchange coincides with ENN's 25th birthday! The foundations of ENN are rooted in Field Exchange, with the first edition put together by hand and with a lot of sticky tape back in 1996. It is fascinating to look back at what Field Exchange has reported on through the years; while some challenges have been addressed, many of the key discussions are sadly still relevant today. **Marie McGrath** (p15), a longstanding Co-Editor of Field Exchange, looks back on some of the issues discussed over the years in a summary news piece included in this edition. We would love to hear your perspective on some of the issues mentioned or other reflections on previous Field Exchange content, so please do send in your letters to the editors. In the meantime, happy reading!

Nicki Connell (*Field Exchange Editor*)
Emily Mates (*Guest Editor, ENN*)

¹ www.enonline.net/ourwork/researchandreviews/adolescentnutrition

² Available: <https://www.thelancet.com/series/maternal-child-undernutrition-progress>



What's new for adolescent nutrition in the DHS Program

By Rukundo Benedict

Rukundo Benedict is the Lead Nutrition Research Associate for The DHS Program. She is a public health nutrition practitioner with expertise in infant and young child feeding (IYCF), adolescent nutrition, community health systems, and the delivery of integrated interventions in low-resource settings. She completed her PhD in International Nutrition from Cornell University and holds an MSPH from Johns Hopkins Bloomberg School of Public Health.

The Demographic and Health Surveys (DHS) Program is a leading source of nutrition data in low- and middle-income countries. Through nationally-representative household surveys, the DHS Program collects nutrition information from children under five, women aged 15-49 years and, in some surveys, from men aged 15-49 years. With the increased global focus on adolescent nutrition, more data is needed to understand the unique nutrition challenges facing this population and to help to inform and guide policies and programmes worldwide.

The DHS Program has routinely collected several nutrition indicators for adolescents aged 15-19 years including anthropometric measurements, anaemia and iron-containing supplementation during pregnancy. Users can explore these indicators for adolescents across countries in the adolescent nutrition StoryMap, the related report and by using STATcompiler. Raw weight, height and date of birth data is available for 15-19 year olds and can be used to calculate population nutritional indicators such as stunting, underweight and overweight. While many previous DHS country reports have presented under- and overweight proportions based on adult body mass index (BMI) definitions, DHS will now use BMI-for-age z-scores for adolescent nutritional status.

In addition, the DHS Program standard Model Questionnaires are updated in each five-year phase of the DHS Program. In the DHS-8 update, several new nutrition-related indicators have been added. These new indicators include information on dietary diversity, unhealthy food consumption and maternal diet counselling during antenatal care. Stakeholders will be able to disaggregate the data by age to specifically explore the adolescent nutrition context.

Strengthening the capacity for data use among key stakeholders is an important goal of the DHS Program. To facilitate the use of DHS nutrition data, the DHS Program has developed an eLearning course entitled 'Nutrition Indicators in Demographic and Health Surveys'. The course is designed to orient programme managers, policymakers, government officials, representatives from civil society, multilateral agencies and others to the nutrition indicators reported in the DHS Program surveys. The course is organised into 12 modules covering nutritional status for children, adolescents and adults, anemia, infant and young child feeding, womens' dietary practices, coverage of nutrition interventions and more. The course will launch later this year on the DHS Program Learning Hub. It will be available for anyone to use free of charge.

For more information, please subscribe to the DHS Program nutrition newsletter at www.dhsprogram.com/

¹ <https://www.dhsprogram.com/>
² https://dhsprogram.com/storymap/adolescent-nutrition/?utm_source=Web&utm_medium=nutrition
³ <https://dhsprogram.com/publications/publication-cr47-comparative-reports.cfm>
⁴ <https://www.statcompiler.com/en/#>
⁵ <https://blog.dhsprogram.com/nutrition-data-in-dhs-8/>



Conducting formative research on adolescent nutrition: Key considerations

By Akriti Singh, Abby Conrad and Lauren Blum

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In September 2021, USAID Advancing Nutrition released guidance outlining the key considerations for designing and conducting formative research on nutrition (e.g., dietary practices, body image and influencing factors) with adolescents 10-19 years of age. The guidance provides background on adolescent nutrition and current research gaps. It also emphasises the role of formative research in designing and refining adolescent nutrition programmes which consider the unique determinants and drivers of nutrition behaviours during adolescence.

To develop the guidance, USAID Advancing Nutrition consulted 13 researchers and project implementers across Asia, Africa, the Middle East, North America and Australia. Their insights were supplemented with a desk review of approximately 20 formative research study reports and guidance documents.

The primary audience for this guidance is programme planners and implementers who aim to design and conduct formative nutrition research with adolescents in low- and middle-income countries. The key considerations are described under the following research steps: 1) determining formative research objectives; 2) designing and conducting formative research; 3) considering ethics and confidentiality; 4) analysing data;

and 5) disseminating and using findings. The guidance also presents participatory nutrition data collection methods appropriate for gathering information from adolescents as well as pointing users to other available literature to support high quality research efforts. Finally, an example is provided on how pre-testing social and behaviour change materials can be utilised when a project may not have the time or resources to conduct formative research.

Common lessons and best practices gathered from the consultations and desk review included 1) focus on key adolescent behaviours and their determinants or drivers; 2) collect data using qualitative, participatory methods; 3) engage adolescents in formative research; 4) tailor data collection to local adolescent social and gender norms; 5) address additional adolescent-specific ethical considerations; 6) involve data collectors and adolescents in data analysis and interpretation; and 7) use creative and innovative approaches to share findings with adolescents, communities and stakeholders.

These learnings have been incorporated into the guidance which is available at: <https://www.advancingnutrition.org/resources/conducting-formative-research-adolescent-nutrition-key-considerations>



Global launch: 'Making Every School a Health Promoting School' initiative

Over 90% of primary school age children and 80% of lower secondary school age children are enrolled in schools around the world, a place where they spend roughly a third of their time. Schools have therefore been recognised as a unique setting for both teaching and reinforcing lifelong healthy behaviours. Despite these opportunities, global mortality and morbidity estimates indicate that school-age children are receiving suboptimal health promotion and care services.

To capitalise on this gap in service delivery, on 22nd June 2021, the World Health Organization (WHO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) chaired a virtual meeting covering their 'Making Every School a Health Promoting School' initiative. The initiative, which is projected to serve over 2.3 billion school-age children, focuses on the formal development and promotion of the Global Standards for Health Promoting Schools. The United Nations (UN) agencies hope that these global standards will pave the way to achieving the WHO's 13th General Programme of Work target by 2023, "1 billion lives made healthier".

Introductions from WHO and UNESCO highlighted the opportunities that school delivery systems can bring, particularly in the wake of the COVID-19 pandemic where governments have been driven to rethink and adapt education systems. The pandemic has raised important questions on how to connect health, wellbeing and learning more closely, with the two UN agencies noting that it is no longer acceptable that any school is not a health promoting school.

The webinar was split into three sessions. Session one emphasised the key messages featured above while also highlighting that only a handful of countries have successfully implemented the Health Promoting School Approach first articulated in 1995 by WHO, UNICEF and UNESCO. The session then covered the launch of the global standards for Health-Promoting Schools,¹ a resource package including four documents – the global standards, implementation guidance, case studies and WHO guidance on school health services.

Session two took the form of a panel discussion featuring the voices of Lovel Kappini and Elena Hakobyan, students from Zambia and Armenia respectively, Elena Sevostyan, an English teacher from Belarus, and Nehe Sharma, School Principal of the Delhi Public School India. Between them, the panellists outlined the need for universal healthy food provision in schools via methods such as hot meal provision or school gardens, greater guidance on healthy lifestyles, such as community-based service linkage or school camps, and comfortable and safe learning environments, ensuring adequate mental and emotional health.

Session three featured experiences from those working in countries aligned with the Health-Promoting Schools initiative as well as a discussion with partner organisations – UNICEF, the World Food Programme (WFP), Save the Children, the Children's Investment Fund Foundation and Academic Partners. Collectively, these testimonies commented on the need for scaling up the initiative, COVID-19 mitigation, integration with other national health initiatives and the need for standards to be both localised and evidence-based.

In summary, despite the successes observed in health promoting within schools, there remain opportunities to improve upon global health objectives. Developing formal global standards is an avenue for success as it is no longer acceptable that any school is not a health promoting school.

Moderators: Selim Razek, student, Vibeke Jensen, UNESCO and Ruediger Krech, WHO.

Speakers: Anshu Banerjee, WHO; Lovel Kapini, student; Elena Hakobyan, student; Elena Sevostyan, English Teacher; Nehe Sharma, School Principal; Nnaniki Makwinja, Ministry of Basic Education, Botswana; El Kashef, Medical Doctor; Suphat Champatong, Ministry of Education, Thailand; Luwei Pearson, UNICEF; Jutta Neitzel, WFP; Susan Sawyer, academic partner on Health-Promoting Schools.

¹ <https://unescochair-ghe.org/2021/06/24/unesco-and-who-urge-countries-to-make-every-school-a-health-promoting-school/>

Research consortium for school health and nutrition: Launch

In January 2020, almost one in every two primary school children worldwide received a meal every day at school. By April 2020, the impact of the COVID-19 pandemic resulted in roughly 370 million children missing out on what had often been their only dependable meal of the day.

Considering this, in May 2021, the London School of Hygiene & Tropical Medicine (LSHTM), in conjunction with a group of member states and partners and financed by the World Food Programme and Dubai Cares, launched a global Research Consortium for School Health and Nutrition.¹ The consortium aims to help countries to re-establish, increase and improve school health and nutrition programmes, providing a safety net for children, creating human capital and promoting economic development. Through the development of a 10-year independent research strategy, the research consortium will address and share strategic research for evidence-based decision-making on school health and nutrition.

At the high-level, public launch, prominent figures within the field spoke on the coalition's action goals and highlighted how these would be supported by the consortium's identified research priorities. Professor Baron Peter Piot, LSHTM Director and keynote speaker, chaired an initial policy-focused discussion prior to a presentation of the Global Research Consortium being delivered. Professor Anne Mills, LSHTM Deputy Director and Provost, then chaired a discussion on three topics of interest: 'The Importance of Data Quality in Decision Making', 'The Importance of a Multi-Sectoral Approach to Research' and 'The Role of School-Based Programmes'.

¹ <https://www.lshtm.ac.uk/research/centres-projects-groups/research-consortium-for-school-health-and-nutrition#welcome>

Adolescent nutrition and anaemia course

In September 2019, Nutrition International launched the Adolescent Nutrition and Anaemia course – a free, 15-module online course with the aim of building capacity to improve nutrition for adolescents around the world. Unfortunately, adolescents are often overlooked and underfunded in health and nutrition interventions, despite this period being a critical window for growth and development. The burden of broader malnutrition and specific micronutrient deficiencies imposes barriers to adolescents realising their full potential. This is especially true for girls who have specific, and often overlooked, biological needs compounded by detrimental social and gender norms. The impact of iron-deficiency anaemia, which is the leading cause of ‘healthy’ life years lost for adolescent girls, is of great concern. Nutrition International’s Adolescent Nutrition and Anaemia course sheds light on this issue, providing valuable insight and guidance regarding this unique and valuable population group.

Designed by Nutrition International’s world-class team of technical experts and programme implementers, this course fills a critical gap in knowledge. It provides practical information to apply to regional, national and global programmes, geared towards helping adolescents to thrive and fulfill their potential. In sharing their rigorously obtained knowledge, Nutrition International hopes to enable other organisations to join the global battle against adolescent malnutrition.

The course has 15 modules which cover a wide range of information on adolescent nutrition, the global situation and the impact of anaemia on women and adolescent girls. Also examined are the causes and consequences of anaemia, the role of iron in the body and some existing interventions used to improve adolescent nutrition at present. The course also covers global guidelines, an adolescent pregnancy subsection and related partnerships in the field as well as an overview of Nutrition International’s adolescent nutrition programmes and lessons learned. Finally, the course includes information on the link between nutrition and education, adolescent health systems, monitoring and assessing adolescent nutrition programmes, data gaps, research needs and how to engage adolescents. Although the course is delivered in English, the narration transcripts for all 15 modules are also available in Bengali, French, Bahasa, Urdu, Gujarati, Hindi, Amharic and Swahili.

There are no necessary prerequisites to begin the course but learners are required to complete the modules in chronological order to progress to the next. The course revolves around video-based learning with the content accessible to a wide audience of nutrition programme officers, non-nutrition development organisations, nutrition graduate students and policy makers at various levels. A personalised certificate is provided upon completion of all 15 modules.

You can sign up for the course free of charge at: <https://global.learning.nutritionintl.org/index>



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The “Adolescent Nutrition Resource Bank”: Practical resources for improving adolescent nutrition programmes

Adolescence is a critical time in the lifecycle, presenting a ‘second window of opportunity’ in an individual’s growth and development. During this time, adolescents build confidence, learn to act independently and make important decisions related to their diet, eating and self-care practices. Addressing the nutritional needs of adolescents presents unique challenges due to the significant variations in their household, school, employment, marital and parental circumstances. It requires the engagement, coordination and joint programming of multiple sectors including health, education, agriculture, food systems, water and sanitation and social protection.

To help to accelerate the design, development, implementation and monitoring and evaluation of adolescent nutrition programmes throughout the world, the United States Agency for International Development (USAID) Advancing Nutrition, the Agency’s flagship multi-sector nutrition project, has developed the Adolescent Nutrition Resource Bank (ANRB).¹ The ANRB is a repository of policies, programme examples, guidance and tools to help adolescent nutrition stakeholders – governments, United Nations agencies, USAID and other donors, development partners, private sector entities, faith-based and youth-led organisations, civil society organisations, service providers, communities and adolescents – to improve and expand adolescent nutrition programmes and services. The ANRB was launched during a webinar² in March 2021. Since then, many participants have engaged with and contributed to this resource bank.

The ANRB contains more than 200 documents with new resources regularly added. All the resources on the ANRB are tagged according to various characteristics, such as the technical areas of focus or the language of publication, and users can filter these characteristics to locate resources that suit their needs. To populate the ANRB, USAID Advancing Nutrition built on adolescent nutrition resources collected under the USAID-supported Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING) project and sought resources from organisations that had signed the 2018 Adolescent Nutrition Call to Action.³

We continue to identify documents through online database searches and the review of selected websites for the latest adolescent nutrition materials and peer-reviewed literature as well as programme reports and other grey literature.

If you have resources to share through the ANRB, please contact USAID Advancing Nutrition at info@advancingnutrition.org

To find more information on the ANRB, or to conduct your own search for resources, please access

<https://www.advancingnutrition.org/resources/adolescent-resource-bank>

¹ <https://www.advancingnutrition.org/resources/adolescent-resource-bank>

² <https://www.advancingnutrition.org/events/2021/02/25/webinar-usaid-advancing-nutrition-adolescent-nutrition-resource-bank-launch>

³ <https://www.spring-nutrition.org/about-us/news/adolescent-nutrition-call-action-better-data-now-drive-better-policies-and-programs>

MMS on Essential Medicine List

Multiple micronutrient supplements (MMS), which have been shown to reduce the risk of small-for-gestational age birth, low birth weight and still-birth (Haider & Bhutta, 2015), have now been included on the World Health Organization Essential Medicines List (EML) (WHO, 2021). The recommendation to include MMS was due to strong evidence that it is both cost-effective and confers significant benefits compared to iron and folic acid supplementation alone. The Micronutrient Forum (2021),

which was one of the first organisations to report on this, heralded the inclusion of MMS as “a huge milestone in making this cost-effective intervention accessible and affordable to pregnant women, particularly in low- and middle-income countries.”

We already know that MMS are effective but why does this development matter? The EML is a coveted collection of medicines that are considered safe and also vital to most effectively support the provision of health

services. The recognition of MMS as an essential medicine reinforces its value to governments around the world who will now be encouraged to incorporate this product into national health policies or state-sponsored programmes. This will hopefully support progress to greater coverage of the use of these supplements globally which is especially pertinent for hard-to-reach groups such as pregnant adolescents who have a particularly high risk of nutritional vulnerability (Nguyen et al, 2017). Therefore, designating MMS in this way will hopefully help to improve adolescent nutrition status, helping to safeguard the health of vulnerable populations around the world.



Pregnant woman taking a micronutrient supplement in Bangladesh

© Shafiqul Alam/Kiron2017

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Expanding youth engagement in health research: The Lancet Youth Advisory Panel

Alongside the growing focus on adolescents in nutrition and health research during recent years, the benefits of engaging youth during the research process have been highlighted. In early 2021, a report by the Wellcome Trust showed that youth participation improves the quality of research since adolescents are able to identify the needs that are pertinent to them, tailor research methods to their interests and experiences and access their peers and communities for more effective data collection and research dissemination (Das et al, 2020). By active engagement in the research process, young people are also heard and empowered through the development of valuable knowledge and skills to improve their nutrition and health behaviours. However, few examples exist of effective youth engagement in practice which is likely due to a range of barriers including a lack of training and guidelines on how to engage and work effectively with youth and inadequate funding

to support such engagement, limiting collaboration between researchers and young people (Das et al, 2020; Sellars et al, 2021).

Such findings have informed efforts by The Lancet Child & Adolescent Health to better engage with young people by including them as research partners. As a first step in April 2021, a call for applications was released for a new Youth Advisory Panel (The Lancet Child & Adolescent Health, 2021). Following nearly 100 applications from 24 countries, the inaugural Youth Advisory Panel was announced in September 2021, including a total of eight members between 16 and 24 years of age (Morgan, 2021). This globally diverse panel of young males and females encompasses a range of personal and professional experiences including living with chronic illnesses, encountering various barriers to accessing nutrition and health services and volunteering and working within the health sector. The panel will sit within the journal's

newly launched International Advisory Board (Lau et al, 2021) to advise on, and contribute to, the development of the journal's content, ensuring that this is meaningful to young people from diverse backgrounds.

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A 9 year old girl standing behind a door in front of her home in Buddhi village, Kapilvastu District, Nepal

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Systems approach to prevent all forms of malnutrition among children 5-19 years

By Deepika Sharma and Vilma Tyler



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Background

Good nutrition is a prerequisite for children's optimal growth and development for children to achieve their full potential to learn and to ensure their health and wellbeing. Malnutrition in any life stage, especially the early years (up to 5 years of age), middle childhood (5-9 years of age) and adolescence (10-19 years of age), impacts life's trajectory in terms of health, learning, productivity and much more (Wells et al, 2020). The benefits of good diets in the first two years are unequivocal; however, children aged 5-19 years may experience catch-up linear growth if they consume improved diets after previous nutritional deprivation. In most countries, middle childhood is marked as the period of formal schooling and a time when children start to develop new capabilities (Bundy et al, 2018). Similarly, adolescence is identified with the onset of puberty, a time to accumulate human and social capital, a time where identities are consolidated and lifelong values formed

(Geidd, 2018). These years are critical because children in these life stages are the first ones to learn, be influenced and adopt lifelong dietary and related habits (Sawyer et al, 2012). Therefore, it is important to ensure that this unique group is well-nourished.

Drivers and determinants of poor nutrition among children

The growing reality is that malnutrition in all its forms – undernutrition, overweight and micronutrient deficiencies – co-exists in communities, families and sometimes even the same individual (Wells et al, 2020). There is growing evidence that children aged 5-19 years are affected by multiple forms of malnutrition. Global shifts to energy-dense but nutrient-poor diets coupled with decreased physical activity have led to sharp increases in overweight, obesity and diet-related noncommunicable diseases (NCDs) in this age group with increased risks for current and future nutrition, health, education and productivity. Diets with limited animal-source food place children and adolescents at risk of poor growth and micronutrient deficiencies (NCD-RisC, 2017).

The data that we have at our disposal indicates that children in low- and middle-income countries, especially in poorer households and rural areas, have diets comprised mainly of staples such as cereals, roots or tubers with few nutrient-rich animal-source foods (Ochola et al, 2014). Moreover, far too many school-age children around the world are missing breakfast, eating too few fruits and vegetables and consuming too many snacks that are high in sugar, salt and saturated fat such as biscuits, sweets and sweetened beverages that are often marketed to them directly (Keats et al, 2018). Low con-

sumption of fruits and vegetables is particularly concerning given that children who eat these foods in childhood are more likely to continue this habit in adulthood.

Further, the school food environment in many countries promotes the consumption of foods that contribute to overweight and obesity (Welker et al, 2016). Ultra-processed foods and sugar-sweetened beverages are often sold to children in school cafeterias or at convenience stores and street stalls near schools. In addition, advertisements for sugar-sweetened beverages, pastries and sweets are commonplace outside schools and can influence food and drink choices among children.

Consequences of poor nutrition among children

Children need good diets to grow, learn and stay physically active. Poor nutrition can delay children's physical growth and development throughout childhood and adolescence, not just in the first five years of life. Stunted children enrol late in school and because of this may receive fewer years of schooling and earn less as adults (Grantham-McGregor et al, 2007; Brooker et al, 1999). Chronic infectious diseases caused by worms and malaria may affect children's attendance at school or their ability to learn while hunger, the most visceral effect of undernutrition, can impair children's attention and ability to concentrate on their lessons. Similarly, overweight children are at risk of developing NCDs such as diabetes. As adults, they may develop diseases of the heart and circulatory system which can be lethal and have long-term economic costs (Bloom et al, 2011). Overall, malnutrition during middle childhood and adolescence can have long-term physical, social, mental and economic consequences and must be prevented.

Systems approach to prevent all forms of malnutrition

Malnutrition is a multi-dimensional issue. It has a multifarious impact on growth and wellbeing and requires a multi-level, multi-component response embedded across various systems (Sawyer et al, 2017; Scaglioni et al, 2018). No single intervention can prevent all forms of malnutrition. It requires concerted and coordinated efforts at various levels – individual/intrapersonal, interpersonal/community, organisation/environmental/ institutional and macro-level/policy or governance – and across various systems such as food, education, health, water and sanitation and social protection (Box 1). A systems approach helps to broaden thinking and identify how different systems affect the determinants of malnutrition among children in middle childhood and adolescence. It provides the opportunity to establish an integrated response to prevent all forms of malnutrition. However, actions across these systems need to be high quality, accessible, affordable and appropriate. Also, these systems need to ensure that the right groups are being reached with the right services. Strong advocacy is needed to ensure comprehensive efforts are made towards strengthening a systems approach from which children and adolescents' benefit.

Conclusion

As we inch towards the global development agenda, it is important that policymakers and implementers develop a coherent response that includes children in middle childhood and adolescence. Successful programming depends on a country's specific context including institutional capacity, financial resources, legal frameworks and ultimately a commitment to improving the nutritional status of children in middle-childhood and adolescence. Countries need to identify and prioritise actions on the basis of the local context, the commitment of leadership, capacities – both internal and external, the finances available and the vision to go to scale and be sustained over the years to come. The bottom line is that children in school-age years and adolescence should benefit from nutritious and safe diets, essential nutrition services and positive nutrition practices for school-age children.

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Box 1

Food system: Policies, strategies and programmes to ensure nutritious, safe, affordable and sustainable diets and improved food environments/dietary practices. For instance, policies, regulations and restrictions on marketing, front-of-package labelling, taxation, national guidelines and standards on school meals, food-based dietary guidelines for 5-19-year-olds, standards for food safety and labelling and large-scale food fortification are effective actions under food systems.

Education system: Policies, strategies and programmes delivered through schools for improving nutrition, alleviating hunger and promoting physical activity (Sawyer et al, 2012; NCD-RisC, 2017). Schools can help to address micronutrient deficiencies and emerging issues of overweight and obesity. The school food environment affects nutrition-related behavior and practices. School-based interventions that are multi-component and involve whole-school activities, including changes in school policies, curricula and the social and physical environment, along with family and community engagement, are most effective (Ochola & Masibo, 2014).

Health system: Policies, strategies and programmes delivered through primary health care platforms to improve nutrition for in- and out-of-school, married and/or pregnant adolescents (Ochola & Masibo, 2014). Actions through the health system include the prevention of anaemia, deworming, school health and nutrition services, care and counselling through adolescent-friendly health centres, malaria screening and prophylaxis to children 5-19 years of age.

Water and sanitation system: Policies, strategies and programmes to improve access to and use of safe drinking water and safe sanitation. Actions to ensure the availability of potable drinking water in schools, households and community levels are required.

Social protection system: Policies, strategies and programmes to create enabling conditions and actions to strengthen the safety net for vulnerable families, effective school feeding programmes and reduce household-level financial and social barriers that contribute to poor nutrition. The social protection system can contribute by subsidising nutritious school meals and providing nutrition education for out-of-school children using behaviour change approaches. Actions may include nutrition education with the provision of food vouchers and cash transfers to families with school-age children to improve access to nutritious and safe foods.



Students receive training in micro-gardening to improve the diversity of meals provided at school

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Students are given medication for intestinal parasitoses, Boloso Sore Woreda, Ethiopia

Non-nutrition interventions to prevent anaemia in school-age children and adolescents



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Background

About one in four school-age children globally are anaemic (WHO, 2008), a condition that affects their growth, learning capacity and physical fitness. A recent analysis of Demographic and Health Survey data from 65 low-income and 22 middle-income countries collected between 2000 and 2017 found that anaemia is a severe public health problem in almost half of these countries, affecting over 40% of non-pregnant adolescent girls (Rukundo et al, 2018). Iron deficiency is commonly assumed to cause a half of all cases of

anaemia (WHO, 2002a), with the other causes including malaria, helminth infections, chronic inflammation and other micronutrient deficiencies. However, a recent systematic review found that the proportion of anaemia associated with iron deficiency may be much lower, especially in countries where infectious diseases are common and the prevalence of anaemia exceeds 40% (Petry et al, 2016). This short review discusses the potential impact of both nutritional and non-nutritional interventions to prevent anaemia in school-age children and adolescents.

Nutrition interventions

To prevent anaemia and iron deficiency, the World Health Organization recommends giving iron supplements intermittently (meaning once, twice or three times a week on non-consecutive days), to school-age children where the prevalence of anaemia is $\geq 20\%$ (WHO, 2011) and, where the prevalence of anaemia is $\geq 40\%$, to increase this to daily iron supplements to adolescent girls (WHO, 2016). In regions where malaria is endemic, iron supplements should only be given in conjunction with adequate measures to prevent, diagnose and treat malaria (WHO, 2011). Systematic reviews of intermittent and daily iron supplements given to school-age children have clearly shown that giving iron effectively prevents anaemia (De-Regil LM et al, 2011), even if malaria is endemic (Neuberger et al, 2016).

Other nutrition interventions that have the potential to increase micronutrient intakes (such as vitamin A supplementation, multiple micronutrient supplements, food supplementation, or food fortification), and those that can improve diet diversity and quality, including school feeding, can also be effective means to

prevent anaemia in school-age children and adolescents (da Siva Lopes et al, 2021). However, giving iron and micronutrients alone may not be sufficient.

Non-nutrition interventions Worm control

While nutrients are essential to manufacture haemoglobin and treat anaemia, addressing underlying infections that cause blood loss is an important first step. For example, in places where infections with hookworms and schistosomes are common, periodic mass treatment with single doses of effective anthelmintics such as albendazole and praziquantel is highly cost-effective (WHO, 2002b) and reduces the risk of anaemia, especially if combined with micronutrient supplements after treatment (Hall et al, 2008). Good sanitation and careful personal hygiene are then essential to prevent reinfection and reduce transmission.

Malaria control

Malaria is a major cause of anaemia, especially in sub-Saharan Africa where the prevalence of any species of *Plasmodium* in school-age children often exceeds 50% (Brooker et al, 2017). When school-age children and adolescents have developed partial immunity, nearly all infections are asymptomatic, so they go undetected and untreated, yet the parasites still destroy red blood corpuscles and contribute to anaemia (White et al, 2018). These asymptomatic infections are also associated with poor health, poor cognitive function and lower educational achievement.

A meta-analysis of the effect in sub-Saharan Africa of presumptively treating asymptomatic school-aged children (5-15 years) for malaria

Box 1 Case study in Mali: impact on anaemia of iron supplements vs. anti-malaria treatment

Two cluster randomised trials conducted in primary schools in the same area of Sikasso region in Southern Mali – an iron supplementation study (Hall et al, 2002) and an anti-malarial intervention conducted 10 years later (Clarke et al, 2017) – provide an interesting case study on the relative impact of iron supplements versus intermittent clearance of malaria parasites on anaemia in school children. Sikasso region has a high prevalence of malnutrition (including iron deficiency) and endemic but seasonal malaria. Therefore, both interventions would be expected to have a substantial impact on anaemia. The iron supplements study, conducted in 2000–2001, reported an initial 56% prevalence of anaemia (62% in boys and 50% in girls) and the anti-malarial trial, conducted in 2011–12, reported an initial prevalence of 63%, indicating little progress in preventing anaemia in this age group over this period. The malaria study also found that 80% of children were infected with *P. falciparum*,² mostly asymptotically.

The iron supplements trial was carried out in 60 primary schools. Children in all schools, intervention and control, were treated with an anthelmintic drug and vitamin A at the start of the school year but children in 30 randomly selected schools were additionally given a weekly iron supplement by their teachers for 10 weeks. The endline survey was conducted between 14 and 16 weeks after the baseline

survey and about two weeks after iron supplementation had finished. The prevalence of anaemia fell by 8.2% (from 58% to 50%) and rose by 9.4% (from 54% to 63%) in the intervention and control groups respectively. The overall difference between the groups was therefore 18% ($p < 0.001$).

The intermittent preventive treatment of malaria trial was conducted 10 years later in 80 randomly selected primary schools, 40 intervention and 40 control schools. It evaluated a single presumptive mass treatment for malaria³ given by teachers at the end of the malaria transmission season in December 2011 to all children in the 40 intervention schools. Two months later the prevalence of anaemia was lower in both groups, but with a greater reduction in the treated group (from 54% to 35% versus 54% to 45% in the control group), an overall difference between the groups of 10% ($p = 0.001$). Six months later, the prevalence of infection with *Plasmodium spp* in the intervention group was still only 9% compared with 75% in the control schools, while 36% of children were anaemic compared with 49% in the control group.

In both studies, the interventions were administered by teachers with supportive training and supervision, showing that teachers in rural Africa can give treatment for malaria as well as micronutrient supplements.

found that treatment with antimalarials was associated with a 23% lower prevalence of anaemia, 72% lower prevalence of infection with *Plasmodium falciparum*¹ and, in some cases, better cognitive function (Cohee et al, 2020). Preventing malaria by sleeping under insecticide-treated nets is also important, especially amongst school-age children and adolescents who are the least likely of any population group to have access to a mosquito net.

An analysis of two cluster randomised trials in Mali conducted ten years apart (see Box 1), provides useful insight into the relative impact of malaria and nutrition interventions on the prevalence of anaemia in school-aged children.

These two treatments given once a year (combined with deworming) could have a significant effect on reducing the prevalence of anaemia in school children, including school-going adolescents. They are relatively cheap, since they can be administered by teachers through the education system.

Conclusion

There is an understandable tendency for nutritionists to focus on nutritional interventions to treat nutritional problems. But in places where parasitic worms cause chronic blood loss or asymptomatic malaria infections cause haemolysis, treating these infections and preventing reinfection will be an important means

to help prevent anaemia and its consequences for school-age and adolescent children during an important period of growth, development and learning.

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¹ Malaria is caused by *Plasmodium* parasites. *Plasmodium falciparum* is the species most likely to progress to severe potentially fatal forms of malaria, including severe anaemia

² In Mali, *P. falciparum* is the predominant species. Study in Sikasso showed that it represented 92.6% of all four species of *Plasmodium* (Ouologuem et al, 2017).

³ Children were treated with artesunate and sulfadoxine-pyrimethamine.

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A student serves a home-grown school lunch to her class in Bwama Primary school in Nyamagabe district, Rwanda

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The importance of school feeding programmes to support the nutrition of school-age children, particularly during the COVID-19 pandemic

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Background

The health and nutrition of school-age children (5-9 years of age; referred to as middle childhood) receives less attention than that of younger children or adolescents. However, this life stage is critical for learning and intellectual development as well as for shaping attitudes, behaviours and practices. An integrated package of essential health and nutrition services implemented through schools is a key investment in better futures for children and their communities. Since the emergence of the COVID-19 pandemic, which resulted in 1.6 billion children being excluded from schools worldwide, these interventions have become even more necessary.

Unfortunately, little to no comparable data is available on the prevalence of underweight and micronutrient deficiencies in children 5-19 years of age. On the other hand, an estimated 131 million school-children were classified as overweight in 2019 (UNICEF, 2020). The rise in the global overweight and obesity epidemic can be attributed to the growth of modern retail and food service sectors across all countries which have led to changes in agriculture and food systems thereby increasing the affordability of, and access to, less nutritious foods and beverages.

The new 8,000 days paradigm and the importance of integrating education and health

The third edition of the World Bank publication, Disease Control Priorities (DCP3), confirms that, while interventions during the first 1,000 days (from conception to two years of age) are important for adequate growth and the prevention of health-related

issues later in life, this is not enough. The publication calls for the evolution of research and action beyond the first 1,000 days to include the next 7,000 days (the period up to 21 years of age) (Bundy et al, 2018). The authors stress that this period is more important than previously recognised to 1) maintain early gains, 2) catch-up on previous growth failures and 3) provide additional support during subsequent vulnerable phases (such as pre-puberty).

Globally, there is no systematic tracking of mortality, health and nutrition during middle childhood. This scarcity of data further anchors the perception that the health and nutrition of children 5-9 years of age may be less important than during other life stages. It also restricts the ability of policy and decision-makers to invest in evidence-based interventions for this age group.

Rates of enrolment in education have increased over recent decades, reaching 91% in many low- and lower-middle income countries (LLMICs) and showing a 20% increase in sub-Saharan Africa between 2000 and 2015 (United Nations, 2015). This provides a particularly important opportunity for improving nutrition and health outcomes in LLMICs via school platforms (Bundy et al, 2018). Despite this, around 59 million primary school-age children are out of school, approximately half of whom live in sub-Saharan Africa. These children are missing out on learning due to poverty, discrimination and the sub-optimal quality of education on offer or because they are too hungry. Several interventions are required to reduce these barriers and create safe school environments that encourage out-of-school children to study and learn while also accessing health and nutrition services delivered through the school platform.

Box 1 Terminology**School feeding:**

The provision of food (meals, snacks or take-home incentives conditional upon school attendance) to children and/or their households through school-based programmes. Meals are either prepared at the school, in the community or are delivered from centralised kitchens. Some programmes provide complete meals while others provide nutritious snacks such as fresh fruit or high-energy biscuits. As often as possible, food is procured, produced or grown locally and should seek to address the nutrient requirements of boys and girls through different strategies such as food fortification of staple foods (rice, oil, etc.) or the supplementation of vitamins and minerals.

School health and nutrition:

A multi-sector approach to design and deliver coordinated and comprehensive strategies, activities and services that are integrated and sustained within the education system to protect and promote the physical, emotional and social development, health and wellbeing of students and their communities. Essential components recognised by existing school health and nutrition programmes include school feeding, deworming, vaccination, supplementation, menstrual hygiene management, oral health promotion, sexual and reproductive health, gender-based violence prevention, social and behaviour change communication, school gardens, vision screening, nutrition education and water, sanitation and hygiene.

age could include school meals, either in the form of a midday snack or a hot meal via HGSF (WFP and the Food and Agriculture Organization of the United Nations, 2018)¹ which may include fortified foods as well as complementary health and nutrition components (see Box 1).

Why schools are useful platforms for delivering health and nutrition services

Economic analyses show that school systems represent cost-effective channels for delivering an integrated package of essential health and nutrition services to schoolchildren (Fernandes & Aurino, 2017). Many health conditions among children can be prevented or treated by interventions delivered through schools which often provide more opportunities to reach children than via health facilities, particularly in rural areas. In LLMICs, incorporating community outreach mechanisms within the education system helps to promote health among children with economic analyses suggesting that school-based health and nutrition programmes can be an essential part of universal primary health care (Watkins et al, 2020).

Global estimates suggest that there are at least 388 million pre-primary, primary and secondary school children receiving school meals every day in at least 161 countries (WFP, 2020c). A cost-benefit analysis conducted by the Harvard School of Public Health showed that in 14 LLMICs, the potential economic returns on investment for school feeding are comparable to the most cost-effective solutions promoted by the Copenhagen consensus (Copenhagen Consensus; Verguet, 2020).

In a recent analysis, the WFP² showed that, of the 251 million children living in countries with poor nutrition, 73 million children from 60 countries (84% in Africa, 15% in Asia and 1% in Latin America (Drake, 2020)) live in extreme poverty (less than USD1.85 per day). Supporting governments to reach these children with nutritious meals and other school health and nutrition interventions is a priority, with a particular focus on Africa.

The COVID-19 pandemic School closures and the impact on children and the broader school community

While school closures may have reduced COVID-19 transmissions in the short-term, they have had serious implications on children's learning, safety, health and wellbeing (WFP, 2020a). For many children, particularly those from the poorest countries and those al-

¹ HGSF constitutes a school feeding model that is designed to provide children in schools with safe, diverse and nutritious food sourced locally from smallholders

² WFP is the largest organisation in the world supporting school meal programmes in more than 70 countries, helping governments to implement national school feeding programmes and reaching more than 12 million school-aged children every year.

Middle childhood: unlocking human capital

A well-nourished, healthy and educated population is the foundation for growth and economic development. Thus, investing in children's nutrition, health and education during middle childhood, and sustaining this into adolescence, will help children to reach their full potential, become productive adults and break the intergenerational cycle of malnutrition (UNICEF, 2020). However, evidence shows a misalignment between investments made in education and those made in health and nutrition. In LLMICs, annual public spending on education during middle childhood and adolescence amounts to USD210 billion, while only USD4 billion is invested in their health and nutrition (Bundy et al, 2018). For the poorest students, school enrolment, regular attendance and learning are often more difficult due to illness, hunger and malnutrition.

Consequences of poor nutrition and health

The impact of not investing in the health and nutrition of learners is catastrophic. Data from demographic and health surveys in more than 70 LLMICs suggest that the annual mortality of children 5-19 years of age is around 2.3 million, with approximately 935,000 deaths for children 5-9 years of age (Bundy et al, 2018). Although these rates are lower than those of other age groups, they still represent a substantial burden and indicate an unfinished agenda towards reducing mortality.

The consequences of poor nutrition in middle childhood include an impaired immune system, increased morbidity and impaired cognition, all of which compromise educational performance and may result in absenteeism and grade repetition or drop-outs. In LLMICs, approximately 300 million schoolchildren have iron-deficiency anaemia, associated with the loss of six Intelligence Quotient points per child (D A Bundy et al, 2018). In Ecuador, 32% of grade repetitions are attributable to

undernutrition (The Economic Commission for Latin America and the Caribbean, 2017). Such consequences translate into the equivalent of 200 to 500 million days of school lost because of ill health, each year, in low income countries (Bundy, 2011).

Benefits of school feeding

The benefits of school feeding go far beyond a school meal and include consequences for equity and inclusion in education. Particularly for girls, encouraging results have been documented on school performance through increased enrolment and sustained attendance (Adelman et al, 2019). By providing healthy balanced meals, school feeding programmes can improve overall micronutrient status and reduce anaemia prevalence in primary school-aged children and adolescent girls (Shrestha et al, 2020). They may also reduce vulnerability and boost family incomes, particularly in times of crisis. The value of a school meal is equivalent to about 10% of a household's income per child which can equate to substantial savings for families with several children in school (Bundy et al, 2018).

In humanitarian contexts, school feeding can limit the negative consequences of emergencies on health, nutrition and education thus lowering barriers to accessing and completing education, especially for girls (Aurino et al, 2019). Including local food sources in school meals can also promote the consumption of diversified diets based on locally available and fresh foods while enhancing local economic development. For example, in Ghana, preliminary findings from an impact evaluation of a Home-grown School Feeding (HGSF) model showed a 33% increase in agricultural sales and household income (Gelli et al, 2016).

Depending on the country context, nutrition situation and the human, financial and infrastructural resources available, an integrated school-based package of services can address both health and nutrition challenges synergistically and enhance cost-efficiency. Such a pack-

ready marginalised or in vulnerable situations, these adverse effects could be lifelong (United Nations, 2020).

The risks for children during this pandemic have included families falling into deeper poverty, threats to survival, health and child safety and an exacerbation of the learning crisis³ (United Nations, 2020). Widespread unemployment and income loss will severely test households' financial ability to keep students in school and, for the poorest households, budget constraints may cause them to keep their children out of school, even when schools reopen (World Bank, 2020). The longer marginalised children are out of school, the less likely they are to return, thereby increasing student dropouts, particularly for girls (World Bank, 2020). School drop-out is also linked with increased child labour, child marriage and transactional sex for children and adolescents (World Bank, 2020). For instance, in Africa, adolescent girls who are out of school are on average twice as likely to start child-bearing than those who are in school (United Nations, 2020).

With children no longer being provided a meal at school (WFP, 2020b), children and their families are missing out on essential safety nets and a much-needed source of nutritious food. Any negative impacts on their nutritional status can, in turn, weaken children's immune systems, increasing the risk of adverse effects should they contract COVID-19 (Jiao et al, 2020) and threatening their longer-term health.

Mitigation measures and getting back to school

In many countries, alternatives to learning and school feeding have been implemented by governments and organisations such as WFP during school closures. Lessons were taught online and school meals were replaced with take-home rations, cash transfers and other alternatives. WFP, together with UNICEF and the Food and Agriculture Organization of the United Nations (FAO), developed guidance for governments to mitigate the effects of the COVID-19 pandemic with a particular focus on the nutrition of schoolchildren (WFP, FAO and UNICEF, 2020). Furthermore, WFP has mapped and developed a dashboard to monitor school closures globally, including tracking the number of children not receiving school meals, and provides up-to-date information on government actions to support out-of-school children (WFP, 2020b). However, even well implemented coping mechanisms are an expensive and inefficient alternative with data from WFP indicating that current mitigation efforts in 70 countries reach only 40% of the 17 million children reached by school feeding programmes prior to the pandemic (WFP, 2020b).

Since measures to reduce the spread of COVID-19 are predicted to remain for years, there is an urgent need for solutions that allow countries to safely return their students to the classroom (Viner et al, 2020). To support this process, the 'Framework for Reopening Schools' developed by four key organisations (United Nations Educational Scientific and Cultural Or-

ganization, UNICEF, the World Bank & WFP, 2020) aims to inform national preparations and guide implementation.

Conclusion

The consequences of school closures on the economic security and wellbeing of children, their families and communities are likely to reverse progress in education over recent decades. Prioritising children returning to school and utilising schools as platforms for improved nutrition and health will have a tremendous impact on future generations.

Since the beginning of the COVID-19 pandemic, there has been more momentum and opportunity to rally governments, donors, organisations and communities around education, health and nutrition. Nations need to recalibrate efforts to ensure health and nutrition services start in the first 1,000 days and continue through the next 7,000 days. They need to focus their attention on middle childhood globally so that schoolchildren access quality meals, become healthier and have better learning opportunities. This would consolidate early investments in the first 1,000 days and build solid foundations for children's futures as well as for their societies.

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³ The Learning Crisis refers to global concern that, despite increases in the number of children enrolled in school, over 50% of children in low- and middle-income countries are unable to read proficiently by age 10. For more information, access: <https://www.unicef.org/rosa/reports/addressing-learning-crisis>

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25 years of Field Exchange: has it made a difference?

So, 25 years of Field Exchange. 25 years of field conversations, writing and editing. 25 years of negotiations, deadlines, print runs, online posts, mailing and reading. 25 years of sharing your stories, successes, challenges and, of course, the lessons learned. Celebrating this milestone, some of the ENN staff suggested that I look back and reflect upon what a difference I think Field Exchange has made. In short, 25 years of the lessons learned from the lessons learned. Here goes.

I first encountered Field Exchange in 1998 as a nutritionist with the non-governmental organisation, Merlin, whilst working in South Sudan. Deliberating with myself over what admission criteria to use in the supplementary feeding programme we were setting up, I happened upon an article¹ in Field Exchange on selective feeding programmes by MSF in Kenya. They described the problems faced and what they did and this resonated with our situation so we promptly did the same. Suddenly, I did not feel so isolated and I felt more confident in my decision; I was no longer alone. A few years later, I wrote an article² on the challenges of research in emergencies during the 1999 Kosovo crisis. I was impressed with the down to earth, grounded and agenda-free editorial team (Jeremy Shoham and Fiona O'Reilly) that helped me do this. So, for me personally, it made a huge difference – there were many other instances when leafing through the latest edition, I learned something and actually took action based on what I had read. Joining the editorial team in early 2002, I've had the privilege of working on Field Exchange ever since – it is fascinating to recall what was discussed all those years ago compared to now. So, looking back, I have identified the 'top eight' areas that stand out for me in terms of contribution to learning and influence through Field Exchange.

Community based management of acute malnutrition (CMAM): Since the early days of Field Exchange, community therapeutic care (CTC), and its subsequent evolution as CMAM, has been a significant feature, indeed the topic most extensively covered over the last 25 years. Early field trials of CTC, key meetings³, the ongoing documentation of programme experiences, periodically collated into special supplements/sections⁴ on CTC⁵, on coverage⁶ and CMAM surge⁷ have all helped to curate evidence on the 'how' of community-based care.

Continuity of care for wasting management: The 60th edition⁸ of Field Exchange was dedicated to continuity of care for wasting treatment, capturing both innovations and trouble spots, synthesising the learning and pinpointing the areas that we needed to collectively act on. This edition was used to directly inform the actions of many stakeholders engaged in wholesale United Nations (UN) reform including the multi-UN Global Action Plan (GAP) on Child Wasting.

Special issue on child wasting in South Asia: This edition⁹ stands out for me as it helped to amplify the regional voice on child wasting that had been under-represented in Field Exchange and more

broadly in international discourse on child wasting. It is also a great example of our collaboration with partners to produce Field Exchange, in this instance with the UNICEF Regional Office for South Asia.

Infant and young child feeding in emergencies: The very first edition of Field Exchange spotlighted gaps¹⁰ in breastfeeding support and the huge barriers to meeting the needs of infants dependent on infant formula. Field articles, including a special edition¹¹ and special section of Field Exchange¹², written by committed and determined practitioners have been instrumental in bring attention to the issues, building knowledge and changing attitudes, policy and practice. This evidence has helped to catalyse the development and continues to inform updates of the Operational Guidance on infant feeding in emergencies (IFE)¹³, a "do's and don'ts" for programmers managed by the IFE Core Group that is now endorsed by the World Health Assembly, available in multiple languages and is the 'go to' international policy guidance.

Special edition on the Syria crisis: In 2013, we dived quick and deep into the response to the Syria crisis that had kicked off in 2011. As it unfolded, we sensed this would be a pivotal learning experience and we needed to capture learning in real time to do it justice. Interviews with more than 100 programmers and visits to Turkey, Jordan and Lebanon were compiled into an extensive special edition¹⁴ providing a perspective¹⁵ that evidenced how we need to do things differently. This helped to shape subsequent thinking and practice in the region and more broadly on the need for contextualised humanitarian response.

Government experiences of CMAM: In 2012, ENN collaborated with the Government of Ethiopia to host a conference in Addis Ababa showcasing government experiences of CMAM. Eighteen months of preparation involved visits to countries to sit with government colleagues to listen, learn and support writing. A special edition of Field Exchange (43)¹⁶ featured these articles, providing a unique and long overdue insight into national perspectives. This informed a commitment and shift within ENN to a more national-oriented lens across all our work, sparking new developments and initiatives, such as a five-year programme to support the knowledge management of the Scaling Up Nutrition (SUN) Movement and the evolution of our sister publication – Nutrition Exchange (now reconfigured as FEX Digests) – to prioritise national and sub-national authorship.

Our collaboration with the Government of Ethiopia reflects the special connection that Field Exchange has with the country – the idea for Field Exchange came out of a United Nations High Commissioner for Refugees (UNHCR)-hosted meeting in Addis Ababa in 1994 and, in 2011, a special focus on Ethiopia in issue 40¹⁷ was used to showcase a country that has placed nutrition and food security concerns at the heart of its development agenda.

Special edition on Nutrition Cluster Coordination: I can remember attending a meeting in the mid-2000s when the Nutrition Cluster was just getting started and many of us were trying to figure out what it was all about. Fast forward a few years and our special edition¹⁸ in 2017 helped to pinpoint exactly that. It was guest-edited by the Global Nutrition Cluster Coordinator and encompassed experiences and lessons learned from seasoned, committed Country Cluster Coordinators. This edition was also a sign of ENN's strong commitment to supporting the Nutrition Cluster which has continued, not least in our role as knowledge management lead¹⁹ for the GNC-Technical Alliance.

Management of small and nutritionally at-risk infants under six months and their mothers (MAMI): Articles in Field Exchange highlighted the challenges that programmers were facing in managing malnourished infants under six months in their treatment programmes which were not designed to cater for the particular needs of this vulnerable group. This sparked investigative research led by ENN, together with University College London Centre for International Child Health and Development, and ACF funded by the Global Nutrition Cluster (the MAMI Project²⁰). In the 12 years since, an active collaboration between policymakers, researchers and programmers (MAMI Global Network²¹) has continued to use Field Exchange as a vehicle to document experiences²², share the latest evidence and innovations, raise the profile of this issue and ultimately influence practice for the better.

I am now a little older than both the field worker I was in South Sudan and that researcher plying her trade during the Kosovo crisis – and I'm not sure any wiser – but I have never forgotten those feelings of isolation in the field, how Field Exchange helped me practically to connect with others and do a better job and the value that the editorial team placed on my frank personal experiences as a way of contributing to our global collective effort. These principles have remained very much at the heart of Field Exchange, 25 years later.

So, has Field Exchange made a difference? In other words, have **you** made a difference? It's a resounding yes from me...

Marie McGrath (*Field Exchange Co-Editor*)

What difference has Field Exchange made to you in the last 25 years? Let us know at fex@ennonline.net

¹ <https://www.ennonline.net/fex/5/selective>

² <https://www.ennonline.net/fex/10/infant>

³ <https://www.ennonline.net/fex/27/enn>

⁴ <https://www.ennonline.net/attachments/856/supplement23.pdf>

⁵ <https://www.ennonline.net/attachments/856/supplement23.pdf>

⁶ <https://www.ennonline.net/attachments/2502/Coverage-Matters.pdf>

⁷ <https://www.ennonline.net/attachments/4032/FEX-64-special-section.pdf>

⁸ <https://www.ennonline.net/fex/60/en>

⁹ <https://www.ennonline.net/fex/63/en>

¹⁰ <https://www.ennonline.net/fex/1/infant>

¹¹ <https://www.ennonline.net/fex/1/infant>

¹² <https://www.ennonline.net/fex/34/en>

¹³ <https://www.ennonline.net/operationalguidance-v3-2017>

¹⁴ <https://www.ennonline.net/fex/48/en>

¹⁵ <https://www.ennonline.net/fex/48/perspective>

¹⁶ <https://www.ennonline.net/fex/43/en>

¹⁷ <https://www.ennonline.net/fex/40/en>

¹⁸ <https://www.ennonline.net/fex/56/en>

¹⁹ <https://www.ennonline.net/attachments/4031/FEX-61-special-section.pdf>

²⁰ <https://www.ennonline.net/ourwork/research/mamireport2010>

²¹ <https://www.ennonline.net/ourwork/research/mami>

²² https://www.ennonline.net/attachments/2989/FEX_58_MAMI_special_section.pdf

Experiences from implementation of a school-based nutrition programme in Wakiso District, Central Uganda



School children in areas where food security, nutrition and education indicators are poor receive one nutritious meal per day

By Lorna Muhirwe, George Kiggundu, Michael Nsimbi and Maginot Aloysius



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The authors would like to acknowledge Save the Children US, Save the Children Korea and Save the Children Italy who are the core funders of the programme. The authors also thank the district education and health teams for their ongoing support and cooperation.

UGANDA

What this article is about: This article outlines a school-based nutrition programme targeting adolescents that incorporated healthcare and interventions, parent-led school feeding and the creation of school gardens.

Key messages:

- By fostering strong linkages between schools and health facilities, high coverage of nutrition-specific activities was achieved for children in programme supported schools.
- The programme highlights that parent-led school feeding programmes are feasible in resource constrained contexts and that they can achieve positive results.

Background

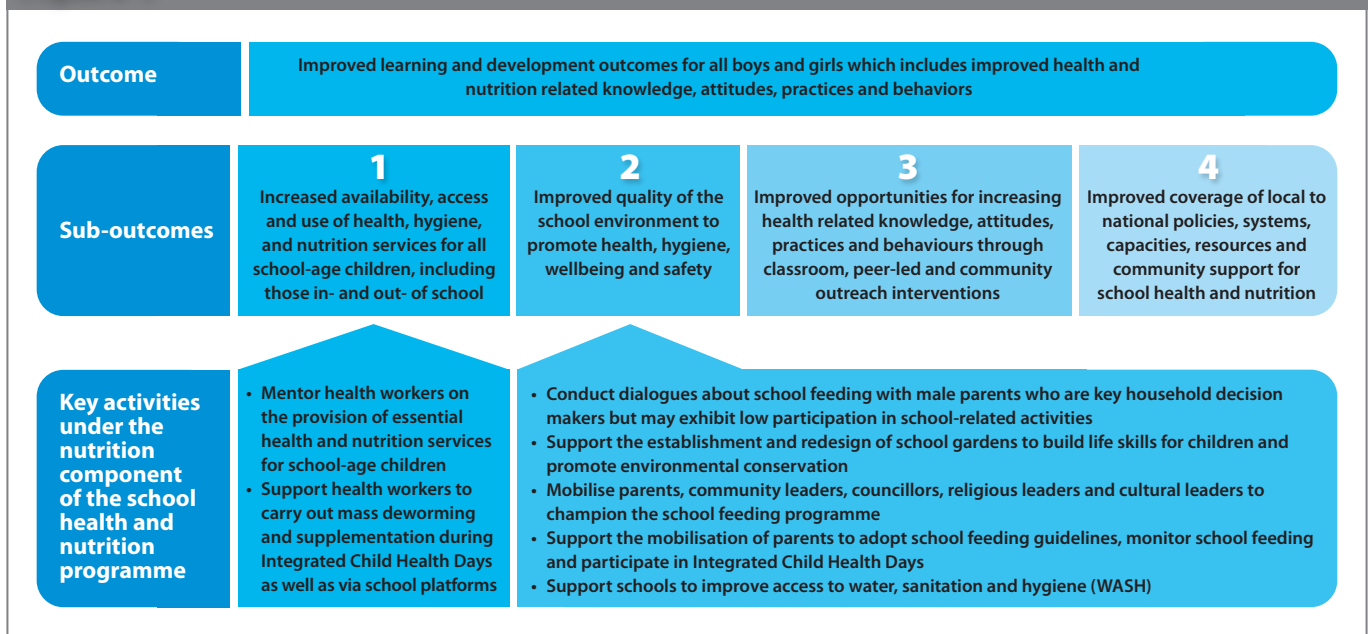
Malnutrition affects over 21% of school-going children in Africa and contributes to immediate and long-term adverse consequences for development and health (Best et al, 2010). Although data on the nutrition status of school-aged children in Uganda is limited, the available evidence indicates that micronutrient deficiencies are common with anaemia rates reaching 46% in girls 11-14 years of age (Barugahara et al, 2013). The prevalence of undernutrition in children aged 5-19 years is 31% among boys and 17% among girls alongside rising burdens of overweight, 16% in girls and 5% in boys (Global Nutrition Report, 2020).

The Ugandan government recognises the importance of school feeding in the national development and learning outcomes for children and has ensured that the policy and legislative environments are supportive of its implementation at scale.

The Education Act of 2008 (ULII, 2008) puts the responsibility on parents and com-

munities to support school feeding either in cash or in kind (i.e., food brought to school). When this system is in place, school administrators, together with parents and communities, determine an appropriate amount of either money or food to be provided per child with a preference towards cash when this is not a prohibitive option for the household.

In 2013, the Ministry of Education and Sports (MoES) issued guidelines on school feeding and nutrition interventions that provided instructions about how to increase access to parent-led school feeding and improve dietary diversity in schools. The guidelines also recommend school-based implementation of complementary interventions such as deworming and improved access to water, sanitation and hygiene (WASH). Deworming and vitamin A supplementation are jointly funded by the government of Uganda and the Ministry of Health and primarily implemented via bi-annual Integrated Child Health Days in

Figure 1 Key activities under the nutrition component of the school health and nutrition programme

April and October of each year. In the context of the COVID-19 pandemic, bimonthly community outreach was also introduced to ensure that children who were vulnerable and not attending school were reached.

As such, the proposed Uganda School Health Policy 2018-2023 recommends a minimum school health package that includes health promotion and education, the prevention of diseases, safe water and sanitation provision, a healthy and safe school environment and other health/nutrition interventions. While this policy remains in draft format, Save the Children is working with the government to support its approval as well as with district-level government to support local, community-led implementation of school feeding. This article shares the experiences from the implementation of such a school-based nutrition programme in Wakiso District, Central Uganda.

Programme description

The school health and nutrition programme forms part of Save the Children's wider 'Baana' sponsorship programme. The Baana programme supports communities in Wakiso District, Central Uganda through integration across various sectors including basic education, school health and nutrition, early childhood development, child protection and livelihoods. The programme is privately funded through three members of Save the Children International (Save the Children US, Save the Children Korea and Save the Children Italy) in support of the local government.

The main aim of the school health and nutrition programme is to improve learning and development outcomes for all boys and girls including improved health and nutrition-related knowledge, attitudes, practice and behaviours. Key activities within the nutrition component specifically contribute to the following sub-

outcomes (Figure 1):

- Sub-outcome 1: Increased availability, access and use of health, hygiene and nutrition services for all school-age children including those in- and out- of school
- Sub-outcome 2: Improved quality of the school environment to promote health, hygiene, wellbeing and safety

The overarching programmatic framework is the Focusing Resources on Effective School Health (FRESH) framework¹ which provides the foundation for developing effective school health programmes and incorporates the following components (programme pillars): (1) equitable school health policies; (2) safe learning environments; (3); skills-based health education; and (4) school-based health and nutrition services.

Since 2018, the school health and nutrition programme has supported the local government to improve the delivery of nutrition services in 82 government-owned primary schools which represent 32% of the schools in Wakiso District, reaching a total of approximately 37,358 children (17,313 girls and 20,072 boys). These schools fall under the catchment area of 23 health facilities in four sub-counties (Table 1).

Sub-outcome 1: Availability, access and use of health, hygiene and nutrition services for in- and out-of school children

Under sub-outcome 1, the programme supports the 23 associated health facilities to provide essential health and nutrition services through

the provision of nutrition assessment and counselling guides as well as conducting needs assessments for health workers and supporting capacity-building within government health structures. The programme also supports community outreach by health facilities, including the bimonthly community outreach activities and child health days, during which children are targeted with comprehensive services such as deworming and vitamin A supplementation. While the programme primarily targets children in school, an inclusive approach is taken to ensure that outreach services are provided to all children in- and out-of-school.

Sub-outcome 2: Improved quality of the school environment

Under sub-outcome 2, community structures, e.g., school management committees (SMCs) and parent-teacher associations (PTAs), are engaged to roll out the parent-led school feeding programme to improve the quality of the school environment. Within schools, the capacity-building of school managers focuses on accountability and the management of funds for school feeding as well as needs assessments and the training of teachers who act as patrons of the programme's school health clubs. School health clubs meet between monthly and three times per term with the aim of planning activities,

Table 1 Schools and health facilities supported, by sub-county

Sub-county	Number of schools	Number of health facilities
Kakiri	21	7
Gombe	25	5
Masulita	18	5
Namayumba	18	4
Total	82	23

¹ FRESH is an inter-agency framework developed by UNESCO, UNICEF, WHO and the World Bank that was launched at the Dakar Education Forum in 2000 to incorporate the experience and expertise of these and other agencies and organisations. It is a global framework for improving the health of school children and youth.

sharing information and tracking the progress of activities aimed at promoting good health, WASH and nutrition practices in the schools.

In addition to the in-cash or in-kind school feeding they provide, parents/guardians are sensitised and encouraged by the programme team to provide children with something to eat before they go to school. Parents also lead initiatives to increase their children's access to sustainable, diverse foods such as implementing and maintaining school gardens. The Community Action Cycle, a seven-stage model for community mobilisation developed by Save the Children, is leveraged to support SMCs and PTAs to develop more sustainable solutions for increased access to, and the availability of, health and nutrition services for school-going children. In particular, schools are supported to improve access to WASH.

Monitoring, evaluation, accountability and learning system

Routine monitoring of outputs and outcomes is conducted on a monthly, quarterly, biannual and annual basis to inform programme reviews and reporting to the district local government, funders and other stakeholders. Quality benchmarks are monitored during implementation with outputs monitored on a termly basis (in March, July and November).

At baseline, a situation analysis was conducted to identify priority problems and opportunities as a basis for developing tailor-made interventions (Save the Children, 2015). Data collection included (1) a review of existing education policies, the Wakiso District development plan, sub-county development plans and other situational analysis reports; (2) interviews and focus group discussions with children, parents and teachers; (3) observations of schools; and (4) a Quality Learning Environment assessment in 15 primary schools. The Baana programme midline evaluation, conducted in August 2019, collected cross-sectional quantitative and qualitative data from 40 schools to assess the degree to which the sub-outcomes had been achieved over the five years of implementation (2015-2019). An endline evaluation is planned for the end of the project.

Key performance indicators and other findings are reviewed in regular project monitoring,

evaluation, accountability and learning (MEAL) meetings to inform decision-making and allow for real-time programme adjustments. Learning is guided by Save the Children Uganda's online issues tracker and the MEAL dashboard which feed information directly into area office and senior management meetings. Special surveys may also be conducted in cases where specific implementation issues need to be explored. For instance, a survey on the parent-led school feeding programme is planned in 2021.

Results

Services for in- and out- of school children

Midline survey results indicated that 73% of schools had a memorandum of understanding with health facilities to inform their collaborative efforts in supporting children with health and nutrition services. This had increased from only 10% of schools at baseline. In addition, at midline, 84% of children in programme-supported schools had accessed deworming services (Table 2).

Parent-led school feeding

At baseline, one of the main reasons for school dropout was the failure of parents to meet the schools' requirements for the payment of school meals. The midline evaluation highlighted parents' involvement in contributing to school meals and parents from nearby communities found that schools that were able to provide a midday meal to children were more attractive. Despite this, the proportion of children who were provided with a meal at school did not increase at midline but stagnated at around 71% from 73% at baseline (Table 2). Of those children who received porridge at school, 61% reported that this was the only meal they had in a day. However, in schools that were more effectively implementing school meals, this was shown to improve attendance and children reported being more motivated to attend school so as not to miss the porridge provided. Additionally, 78% of children reported being given something to eat at home before coming to school in the morning during the midline assessment. By 2020, 94% of schools had a school feeding programme/policy in place and 83% of schools had adapted the school feeding guidelines.

School gardens

Observational data showed that the percentage

of schools with school gardens increased from 28% to 82% between baseline and midline (Table 2). Many of these were demonstration gardens being used to demonstrate good agricultural practices to parents and boost child feeding at home. In addition, 28 schools (34%) had functional school gardens for school feeding and were growing vegetables and fruit trees (programme outcome monitoring report quarter 1, 2021). According to the project monitoring reports, the number of schools with functional school gardens, not just demonstration gardens, had increased to 71 (88%) by the end of quarter one, 2021. Of those schools that did not have functional school gardens, the reasons included lack of land, the challenges of animals grazing on school land or still being in the planning phase. In 2021, 85% of schools with functional school gardens reported having harvested food for the school feeding programme although yields varied widely between schools.

While many parents engaged with the school gardening activities, 27% of schools reported that parents were opposed to children participating in school gardening. Of those with school gardens, 14% of schools had received quarterly support from an agricultural extension officer (programme outcome monitoring report quarter 1, 2021).

WASH services

At baseline, only 48% of schools had access to safe potable (drinking) water and 10% had handwashing facilities with soap. The quality of the school environment improved substantially from baseline to midline with access to safe drinking water reaching 82% and the availability of hand washing facilities reaching 70% at midline (Table 2).

The proportion of schools with recommended sanitation facilities also increased from 51% at baseline to 95% at midline (Table 2). Improvements were a result of the deliberate engagement of parents in mobilising resources for WASH facilities including setting up low-cost handwashing facilities such as tippy taps, water storage and waste disposal.

Successes and challenges

What went well and why

High coverage of nutrition-specific activities has been achieved for children in programme supported schools. This has been made possible through fostering strong collaborative linkages between the education (schools) and health (health facilities) sectors with schools being prioritised as outreach sites for Integrated Child Health Days.

Community engagement through the community action cycle and engagement with the school management committees has contributed to parents' involvement in the school health and nutrition programme activities. Parents' awareness of the school feeding guidelines has been increased through popularising the guidelines using print and audio media, parents are involved in monitoring school gardens and

Table 2 Key performance indicators

	Baseline (2015)	Midline (2019)
Proportion of school children dewormed	Not assessed	84%
Proportion of children provided with a meal at school	73%	71%
Proportion of schools with a functional solid waste and environment management system	47%	89%
Proportion of schools with functioning latrines	51%	95%
Proportion of schools with access to safe drinking water	48%	82%
Proportion of schools with functioning hand washing facilities (including soap)	10%	70%
Proportion of schools with demonstration gardens	28%	82%

Data source: Baseline (2015) and Midline evaluation (2019)

community dialogues with male parents have increased male involvement in the nutrition of children at household level. There have also been improvements in school environments with increased access to WASH facilities.

Challenges and mitigation measures

Social determinants

Social determinants at household level, such as poverty, affect parental uptake of school feeding due to a lack of cash or food available to meet the schools' requirements. The programme integrated nutrition-sensitive livelihood activities such as using the parent-teacher association platforms to train parents in soap making. Soap making expands income generating opportunities for poor households that could translate into the purchase of food as well as promoting practices like handwashing.

Limited institutionalisation of the school feeding programme

Although school feeding programmes are gradually being institutionalised at school level, there is a limited commitment of resources for ongoing capacity-building and follow up at district level. In some of the programme supported schools, school heads, whose capacity as focal persons had been built by Save the Children, were transferred out, creating a gap in continuity. Save the Children has continued to conduct trainings for new school feeding programme focal persons while advocating for more resource commitments from the local government.

COVID-19 pandemic

The COVID-19 pandemic led to repeated, country-wide disruptions in the school calendar because of protracted school closures. This affected activity implementation especially in light of the further movement restrictions that limited the ability of parents and teachers to monitor the school gardens. The programme therefore targeted more resources towards COVID-19 adaptations mainly around improving school readiness for reopening.

Community ownership

Community ownership of the school feeding programmes was a challenge and still needs to be improved. Due to misconceptions around education policies, communities perceive school feeding as the sole responsibility of the government. The school health and nutrition programme is focused on increased community level advocacy and sensitisation to highlight the important role that parents and communities can play in ensuring school feeding programmes are effective and functional – and building their capacity to fulfil this role.

Lessons learned

Favourable policy and guideline frameworks at the national level are critical building blocks to drive school-based nutrition programmes at a sub-national level. The programme has demonstrated how the MoES's guidelines on school feeding can be operationalised by schools and districts while documenting challenges and les-

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School feeding programme in Uganda

sions learned to inform implementing organisations and other districts across the country.

The use of multi-sector platforms for advancing school-based nutrition programmes can increase buy-in and support for these programmes. The programme has focused on community engagement, leveraged agricultural extension workers and has cross-trained both education and health technical officers such as teachers, health assistants and health inspectors to increase input from multiple stakeholders into the school-based nutrition programme.

The rapid uptake and institutionalisation of school-based nutrition programming is most feasible at the school level especially when existing structures such as SMCs and PTAs are engaged and involved. Schools are able to allocate resources towards school-based nutrition once buy-in has been achieved. At higher levels of the education system, such as the district level, evidence generation and advocacy need to be prioritised to accelerate the long-term sustainability of these programmes.

Conclusion

The Save the Children programme has a memorandum of understanding with the local government that stipulates the roles and responsibilities of each party with a view to ensuring the sustainability of the interventions. However, there is a need for the programme to work more closely with local government structures to define key transition targets and align these with government planning and budgeting cycles. Local structures have been empowered to drive interventions on school-based nutrition while promoting sustainability and ownership at the implementation/school level.

This programme has demonstrated that parent-led school feeding programmes are feasible in resource constrained contexts and achieve positive results. Enabling factors include collaboration across the health, education, agriculture and livelihood sectors, the availability of school feeding guidelines and the capacity-building of stakeholders through dialogues and training to enable them to fulfil their unique roles in the school feeding programme.

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Adolescents taking the lead in planting fruit trees at their school orchard in Chivi, Zimbabwe

Promoting youth leadership on nutrition through junior parliamentarians and junior council engagement in Zimbabwe

By Progress Katete, Kudakwashe Zombe and Dexter Chagwena



health nutrition interventions and capacity building.

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ZIMBABWE

What this article is about: This article covers the role of the junior parliament of Zimbabwe in implementing a youth-led nutrition advocacy initiative in six districts of the country, promoting healthy lifestyles and eating behaviors amongst their peers. The project aims to provide capacity-building and a platform for junior parliamentarians and councillors to identify key adolescent nutrition challenges as well as to develop key advocacy actions and messages to address these challenges within the school environment.

Key messages:

- A total of 35 schools were reached by the trained advocates and these schools were able to implement 60% of the activities in their nutrition advocacy plans within the first four months.
- Using an already existing government structure, that of the junior parliament, and schools as points of entry enabled the project to leverage already existing personal and institutional relations and ensured stakeholder buy-in.
- Empowering young people to be innovative and champions of change at their schools and amongst peers, in the spirit of 'for young people, by young people', is a powerful tool to improve school environments to enable positive nutrition practices and to influence other adolescents.

Background

Currently available nutrition data in Zimbabwe has shown that the prevalence of adolescent malnutrition is of public health concern although trends between girls and boys vary. The Zimbabwe Demographic and Health Survey of 2015 indicated a double burden of malnutrition among adolescent girls aged 15-19 years with boys in the same age group mainly affected by undernutrition. While underweight affected more boys (30.7%) (ICF, 2015) compared to girls (12.5%), the prevalence of overweight among girls was 13.3% compared to 1.4% of boys. Micronutrient deficiencies also affect adolescents in Zimbabwe with 26.5% of girls and 20.4% of boys having anaemia. The drivers of adolescent malnutrition are multiple and include limited access to adequate, safe and nutritious food, a lack of nutrition knowledge and poor food choices. This is further exacerbated by the unregulated marketing of unhealthy foods and drinks and food environments that primarily include foods high in fat, sugar and salt.

A focus on adolescent nutrition programming has been lacking in Zimbabwe although recently shifts have been seen because of the development of numerous initiatives including an adolescent nutrition strategy 2022-2026, an ongoing iron-folate supplementation pilot programme and a series of adolescent and youth engagement initiatives¹ focused on promoting the participation of young people in nutrition-related activities. These include co-creation workshops with adolescents as well as capacity-building activities with government ministries and non-governmental organisations to mainstream nutrition as part of

adolescent health, education, agriculture and protection programmes. In addition, the Zimbabwe School Health Policy² outlines a reference framework to guide the implementation of several health and nutrition services within the education sector. These services include nutrition screening, immunisation campaigns and nutrition education. The policy also encompasses the Home-Grown School Feeding Program which encourages the provision of nutritious meals to all learners and is used as a teaching tool for the promotion of nutritious diets.

Role of junior parliament and council in the Scaling Up Nutrition (SUN) movement

The junior parliament of Zimbabwe is a recognised structure within the government and mirrors the structure of the senior parliament with each constituency having a youth parliamentarian representative. It was established in 1991 as a move by the government to effectively engage children in policy processes. It is the official platform for children to be engaged in matters affecting them and is used to bring the challenges that Zimbabwean children face to the attention of the government and other stakeholders. Housed by the Zimbabwe Youth Council within the Ministry of Youth, the junior parlia-

¹ UNICEF (2018) Zimbabwe harnessing youth driven digital solutions for nutrition. Available at <https://unicef.sharepoint.com/sites/ICON/SitePages/UNICEF-Zimbabwe-harnessing-youth-driven-digital-solutions-for-nutrition--Hack4Nutrition.aspx>

² Government of Zimbabwe (2018) Zimbabwe School Health Policy, available at: <http://www.mopse.co.zw/sites/default/files/public/downloads/ZSHP%20final%20signed%20March%202018.pdf> /

Adolescent nutrition champions attentively listening to discussions of the day during a parliamentary engagement, Harare, Zimbabwe



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ment consists of a junior senate and national assembly that are comprised of 80 and 210 members respectively. These youth parliamentarians advocate for the rights of children and the inclusion of youth voices in government processes and decision-making.

Youth-led nutrition advocacy project

Since its inception, the junior parliament has been instrumental in highlighting the key challenges that Zimbabwean children and youth face and presenting these to government representatives and other stakeholders. To highlight the importance of nutrition, the Zimbabwe Civil Society Organisations Scaling Up Nutrition (SUN) Alliance (ZCSOSUNA³), with technical and financial support from UNICEF and working closely with the Ministry of Primary and Secondary Education (MoPSE) and Ministry of Health and Child Care (MoHCC), utilised the junior parliament platform to implement a youth-led nutrition advocacy initiative in six districts in Zimbabwe.

The project aimed to provide capacity-building and a platform for junior parliamentarians and councillors to identify key adolescent nutrition challenges as well as to develop key advocacy actions and messages to address these challenges within the school environment. By building the capacity of junior parliamentarians to become youth advocates for nutrition, it was hoped that they would take a leading role in creating supportive school environments for healthy food choices as well as promoting healthy lifestyle choices amongst their peers. The project further aimed to use these experiences to engage the Senior Parliamentary Portfolio Committee on Primary and Secondary Education to improve school food environments more broadly. The project was implemented from December 2020 to June 2021.

Project inception and training

The project began with an inception meeting, conducted virtually due to COVID-19 restrictions, with a number of nutrition stakeholders. An inter-sectorial partnership involving the health, education and youth sectors was established to advance the implementation of the project. Partners included the MoPSE, the MoHCC, the Zimbabwe Youth Council, ZCSOSUNA and UNICEF. The inception meeting aimed to discuss the project's objectives, proposed activities and partner obligations to support junior parliamentarians in developing and implementing their advocacy plans. A subsequently developed implementation roadmap clearly outlined the complementary roles and responsibilities of each stakeholder within the project.

Following this, a series of three eight-hour virtual training workshops on nutrition advocacy were held with a total of 55 junior parliamentarians and councillors using the Nutrition Youth Advocacy Toolkit⁴ developed by Save the Children. Participating junior parliamentarians were drawn from six districts of the country and selection was based on interest in nutrition and access to information and com-

munications technology services (as the project was launched and mostly implemented through virtual platforms). All 55 participants were between 10-19 years of age and represented 35 schools located across the six districts. The trainings orientated participants on the costs of malnutrition on both human and economic development and provided participants with background information on nutrition-related advocacy. The trainings were designed to allow participants to freely explore and share ideas on how to effectively advocate for changes within the school environment to promote and maintain healthy lifestyles among learners.

Developing nutrition advocacy plans

After the completion of the training, nutrition advocates were tasked with developing advocacy plans that they could implement in their schools to help to improve the school nutrition environment. Advocacy plans were developed with the help of their respective school health authorities and with technical oversight from ZCSOSUNA. Nutrition advocacy plans included activities to reach school learners to improve their knowledge and decision-making related to healthy eating and the importance of maintaining an active lifestyle. The advocacy plans developed were contextual and examples of these included peer-to-peer education in school health clubs to inspire behavior change, the engagement of vendors and school 'tuck shops' and school development committees to encourage the selling of healthier snacks and foods for improved food environments as well as the establishment of school orchards within school yards to promote access to, and the consumption of, fresh fruits.

To ensure that the plans were feasible, the nutrition advocates worked closely with their relevant school-level stakeholders including school health authorities such as school health coordinators and school development committees. Advocacy strategies used by junior parliamentarians to encourage the participation of their peers included holding health club meetings on nutrition, nutrition-related drama and theatre events by local groups and fundraising 'edutainment' activities involving dance, music and sport competitions where nutrition-related activities were discussed and conducted. In addition to the localised school-based plans, representatives of the trained junior parliamentarians

from the six districts raised a motion engaging the National Senior Parliamentary Portfolio Committee on Primary and Secondary Education to commit to improving school food environments. High-level advocacy plans with activities such as engaging senior parliamentarians were funded by the project fund while school-level advocacy plans such as establishing orchards were supported by the advocates' efforts and local school authorities.

Monitoring and supportive supervision

Following the finalisation and approval of advocacy plans, the trained advocates began to implement the suggested strategies and activities with support and mentorship. The approval process enrolled members of the school's development committee to review plans, determining if they addressed the challenges specific to the school and were both realistic and achievable. A team comprised of ZCSOSUNA, UNICEF, MoHCC and MoPSE conducted monitoring visits to 24 of the advocates to monitor implementation progress. Due to COVID-19 restrictions on public gatherings, schools closed early at the time of the visits which limited the number of parliamentarians who could feasibly complete these monitoring activities to 24 out of 55. Monitoring visits also provided a platform to link advocates with already existing platforms in their constituencies, including District Food and Nutrition Security Committees, to further support the work of the advocates. Senior nutrition youth advocates from the SUN Movement also provided mentorship to these junior parliamentarians and took part in the school-based supportive supervision visits.

Results

In the 35 schools where youth advocates conducted group nutrition education sessions during school assemblies at least once a week, at least 300 learners attended each session. Approximately 15,000 adolescent learners were reached within the six months of project implementation.

¹ ZCSOSUNA is an alliance of civil-society organisations including local and International NGOs implementing nutrition-related programs at any level of the country. It acts as the secretariat and advocacy arm of the SUN Movement civil society network.

⁴ <https://resourcecentre.savethechildren.net/node/15313/pdf/yln-nutritional-toolkit.pdf>



Trained youth advocates finalising their advocacy plans with support from a national official, Chivi, Zimbabwe

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tainability of this effort and to engage young people both in and out of schools. Prior to this project, the youth nutrition network consisted of 14 trained youth advocates with the main aim of amplifying youth voices in relation to nutrition. Members of the network are involved in the design, implementation and monitoring of nutrition interventions within the civil society network. Moving forwards, this group will represent youths in their constituencies on all matters related to nutrition during the consultation and design of interventions. Plans are underway to ensure that they are members of the Food and Nutrition Security Committees at various levels, ensuring that energy, expertise and youth leadership is equally distributed to usher in continuous development.

Successes, challenges and lessons learned

Successes

The partnership between UNICEF, ZCSO SUNA, MoHCC and MoPSE played a critical role in the successful implementation of the project. The project's implementation manual clearly outlined the complementary roles and responsibilities of each stake holder and that ensured smooth operation and no duplication of effort within the project cycle.

The project was able to reach a large number of adolescents within schools and helped to raise the youth voice within nutrition programmes at school level. The use of peer adolescents as agents of change encouraged the participation of other adolescents.

Using an already existing government structure, that of the junior parliament, and schools as points of entry enabled the project to leverage already existing personal and institutional relations and ensured stakeholder buy-in. Given the role and the mandate of the junior parliament, the project was able to easily engage and influence senior parliamentarians.

Youth advocates were able to formulate their own plans on how they could improve their own school food environments. This enabled a contextualised approach where advocates were empowered to be innovative and to identify solutions relevant to their settings. This also empowered youths to be 'agents of change' as the responsibility to implement their action plans largely relied on them.

Sensitisation and the involvement of key stakeholders from national to district level enabled the acceleration of project implementation and ensured those at district level were involved and able to build strong working relationships with the nutrition advocates.

Challenges

Unfortunately, schools had to close as part of the COVID-19 public health measures before notable change had occurred and the activities were fully implemented. Due to restrictions because of the COVID-19 pandemic, the project implementation modalities had to shift leading to inception meetings and trainings being con-

ducted online. Intermittent internet connectivity affected the participation of some learners and meant that some youth advocates struggled to fully participate in the trainings. Furthermore, the lockdowns meant a ban on public gatherings and delays to the reopening of schools upon which the successful implementation and completion of the project depended. Subsequently, there was a limited time to implement the nutrition advocacy plans.

Lessons learned

One of the biggest learnings from this project was the need to be flexible, particularly in light of the COVID-19 pandemic. The COVID-19 related travel restrictions made in person meetings challenging and at times impossible. However, other platforms such as WhatsApp were successfully utilised to connect with advocates and to monitor progress.

Sufficiently capacitating youth advocates on nutrition topics helped to ensure young people understood nutrition, why it is important and the implications of poor nutrition on health. This helped to build interest amongst the youth and enabled them to create plans to best support their constituencies and peers.

Future similar projects should consider a longer period of implementation as the six months of implementation for this project was deemed too short to have a true impact on adolescent nutrition. Future projects also need to tailor project activities to measure the behavior change of learners in schools.

In addition to individual campaigns targeting specific schools, national-level campaigns would be valuable to complement or emphasise the efforts that are being conducted at school-level.

Conclusion

Empowering young people to be champions of change at their schools and amongst peers, in the spirit of 'for young people, by young people', is a powerful tool to improve school environments to enable positive nutrition practices and to influence other adolescents. It is hoped that the continuous use of such mechanisms and platforms will lead to broader policy reforms in Zimbabwe. The established SUN Movement will continue to mobilise resources to support youth advocates to contribute towards the transformation of school food environments and for better nutrition in the country. This project demonstrated the successful fostering of partnerships between the health, education and youth sectors in mainstreaming nutrition for adolescents. Such a model will be scaled up as part of the ongoing adolescent nutrition programming efforts to improve national legislation around food and to improve the food systems in and around school environments.

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Improving adolescents' food choices: Learnings from the Bhalo Khabo Bhalo Thakbo ("Eat Well, Live Well") campaign in Bangladesh

By Inka Barnett, Wendy Gonzalez, Moniruzzaman Bipul, Detepriya Chowdhury, Eric Djimeu Wouabe, Ashish Kumar Deo and Rudaba Khondker



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A school-based pledge event in Dhaka, Bangladesh

BANGLADESH

What this article is about: This article details the co-design, implementation and early evaluation results of an initiative for promoting the consumption of nutritious foods in adolescents. The initiative involved school and community activities, social media and celebrity endorsements and a pledge for individual and collective action.

Key messages:

- Despite baseline surveys indicating that many adolescents had poor access to the internet, a social media-focused intervention proved to be an effective strategy to target this group during the COVID-19 pandemic when internet usage increased dramatically.
- By building a narrative that tapped into adolescents' motivations, the Bhala Khabo Bhala Thakbo campaign was able to spark the interest and engagement of adolescents for improving their consumption of nutritious foods.

Background

Adequate nutrition is critical to the optimal growth and development of Bangladesh's 36 million adolescents who make up nearly one-fifth of the country's total population (Bangladesh Bureau of Statistics, 2015) and will contribute to the country's future. However, poor nutrition remains a challenge. Currently, one third of adolescent girls and one fifth of adolescent boys 15-19 years of age in the country are stunted and 10% of unmarried girls 15-19 years of age are overweight (NIPORT, 2021).

Inadequate nutrition is influenced by several structural and socio-cultural factors, prominent among which is that adolescents are rarely recognised by decision makers as having unique nutritional needs as well as growing agency to make their own decisions. Efforts to engage adolescents and to enable them to participate in decision-making are needed to capitalise on their potential for generating transformative change. Co-designed with adolescents and using learnings and experiences from building social movements, the Bhala Khabo Bhala Thakbo - BKBT ("Eat Well, Live Well") campaign in Bangladesh aimed to activate adolescents' agency (i.e., their capability to act for a given purpose) and trigger both individual and collective

action towards improved food choices. This article discusses the process and key elements of the design, implementation and independent evaluation of the BKBT campaign in Bangladesh.

The BKBT campaign

The BKBT campaign was designed through an 18-month collaborative process (February 2018 to August 2019) among relevant governmental agencies, GAIN, local partners and adolescents. The campaign was built around two fundamental insights generated from formative research: (1) adolescents have dreams for their lives but find it difficult to "untangle" their dreams from the more restrictive ambitions that their parents have for them, and (2) adolescents recognise that in order to achieve their dreams they need powerful bodies and minds "nourished" by nutritious food. Furthermore, the formative research revealed a limited availability of nutritious foods for adolescents, especially around schools. Popular snacks included packaged biscuits and cakes, chocolate, crisps and foods prepared by street vendors such as deep-fried puri (deep-fried bread), singhara (deep-fried potato pockets) and jhalmuri (puffed rice with fried vegetables and spices).

The BKBT campaign consisted of three phases: the catalyst 'my dream, my decision'

Box 1 The Eat Well, Live Well/Bhalo Khabo, Bhalo Thakbo pledge

"We, the 32 million teenagers of Bangladesh, have been spending our tiffin money on foods that aren't nutritious and don't prepare us to chase our dreams. But this is our tiffin money, it is something that we control. So, as individuals, we pledge to change our food habits and use our tiffin money to buy more nutritious foods. But our options are limited. There are not enough good choices for us to make. So, we must work together to change the way food is produced, manufactured and sold so that we can make nutritious, tasty choices every day. That is why we must all take the pledge. Together we can make this change."

"I echo the voices of 32 million adolescents of Bangladesh, and pledge that I will buy more nutritious food with my pocket money."

Box 2 BKBT's Theory of Change

The BKBT campaign aimed to generate individual and collective action. On an individual level, it sought to increase adolescents' willingness to purchase and consume more nutritious snack foods. On a collective level, and as a long-term goal, it aimed to trigger adolescent-led social actions to improve the supply of nutritious snacks in Bangladesh. Adolescents' engagement with the campaign and its activities was expected to increase their knowledge and awareness of the importance of choosing nutritious snack foods (to achieve one's dreams). This would lead to a change in their attitudes towards nutritious snacks, increasing their motivation and willingness to purchase and consume these. Adolescents would then take the pocket money pledge as an individual goal setting strategy, providing a practical approach to translate their willingness to improve their snack choices into action. While attempting to improve their snack food choices, adolescents would identify and voice (individually and collectively) a lack of (or limited availability and/or accessibility) of nutritious snack food choices at, and near to, their school. This realisation would also be facilitated by campaign activities to raise awareness. As more adolescents took the pocket money pledge, this would act as a symbol for collective demand for improved availability of nutritious snack foods. Other campaign activities would promote and support adolescent-led individual action and, in the long term, collective action for demanding improved supply of nutritious snacks.

phase, the pledge ('I will use my pocket money to buy nutritious snacks') and the pledge in action.

The catalyst 'My dream, my decision'

'My dream, my decision' used innovative consumer-marketing strategies such as interactive social media (i.e., Facebook, videos, memes, facilitation of social media influencers) to reach and engage adolescents and activate their agency and responsibility through three stages.

As part of stage one, 'Express Your Dream' (mid-July to early September 2019), adolescents expressed their dreams and aspirations for their future. This was done through sharing short entertaining videos of themselves (mainly via Facebook) in which they reflected on their future dreams and the potential discrepancies between their aspirations and their parents' expectations. In all, 470 videos were posted by the adolescents by mid-September. One video achieved eight million views and five others exceeded 100,000 views.

During stage two, 'Feel Validated' (September 2019), social media influencers, parents and peers actively engaged with the adolescents' videos, praising them for having the courage to articulate their dreams for their futures. National celebrities including Anisul Huq (a respected author with 1.4 million Facebook followers), Ayman Sadiq (an online educator with 944,000 Facebook followers) and Wasfia Nazneen (a known female Bangladeshi mountaineer with 327,000 Facebook followers) engaged with the campaign by telling their 'success stories'. This emphasised to the adolescents that fulfilling their dreams is possible with commitment and responsibility.

Finally, during stage three, 'Feel Challenged' (October 2019), social media influencers posted on Facebook to challenge adolescents to recognise that fulfilling one's dreams requires constant commitment and taking care of oneself, both physically and mentally, every day. This included emphasising the need for adolescents to improve their diets by spending their pocket money on nutritious foods.

The pledge

The pledge (see Box 1) kicked off in October 2019 via a series of school-based pledging events and the launch of the campaign's website¹ which allowed adolescents from all over the country to

take the pledge online. In February 2020, the campaign launched a promotional video² to mobilise online pledges. This was followed by an online campaign in May 2020 which featured the former captain of the Bangladesh cricket team, Mashrafe Mortaza, who is now a member of parliament. The promotional video helped adolescents to make the connection between the dreams that they had enthusiastically articulated in 'Express Your Dream' with improving their diets. It also helped to align the offline and online activities to ensure that, regardless of social media access, adolescents would be reached with the same core message and narrative. By November 2020, over one million adolescents had pledged to use their pocket money to buy more nutritious foods with more than half of the pledges being made offline. These pledges acknowledge the limited options that adolescents have for buying nutritious foods thus demonstrating the unmet demand for these foods.

The pledge in action

The pledge in action phase aimed to support adolescents on their journey towards meeting their pledge commitment by raising awareness and providing guidance on choosing nutritious foods. For this purpose, the campaign organised a series of school events (implemented before March 2020) and online activities throughout 2020 and 2021.

The impact of the COVID-19 pandemic

In March 2020, as schools closed and adolescents began spending most of their time at home, BKBT adjusted, adapted and refocused its efforts to ensure adequate reach and delivery of relevant messages that resonated with the new reality of the COVID-19 pandemic. The main adaptations as a result of the pandemic were:

Shifting the pledge's focus – the pledge focused on nudging adolescents to use their pocket money to purchase more nutritious snacks. With school closures and movement restrictions, the focus shifted to promoting the consumption of nutritious foods at home. This allowed for opportunities to implement new activities, such as helping adolescents to gain new cooking skills (e.g., by organising online cooking competitions to prepare healthy breakfasts, soups, etc.) and encouraging their involvement in meal preparation at home among others.

Strengthening the campaign's online component

– the campaign replaced planned offline activities such as school events with online and radio activities (e.g., mini campaigns, online competitions, engagement of influencers, radio shows) to support adolescents in meeting their pledge commitments. It also reinforced the government's messages to prevent the spread of COVID-19 while encouraging the consumption of nutritious foods and the importance of remaining physically active.

Exploring new channels for engaging adolescents

– by mid-2020, the campaign sought to reach adolescents without internet access by liaising with a local partner experienced in community outreach. Following COVID-19 safety protocols, a network of community workers comprised of young peer educators engaged with adolescents in their communities to disseminate key campaign messages, promote the pledge and support COVID-19 safety measures (e.g., by distributing hand sanitiser).

Focusing on individual actions

– the campaign aimed to support the adolescents' collective journey towards demanding more nutritious food. For instance, it planned to support pledgers and schools to work together with food vendors to improve the availability of more nutritious snacks around school venues. With the onset of the pandemic, these efforts were halted to prioritise supporting adolescents' individual consumption of more nutritious foods.

Evaluation of the BKBT campaign

A consortium of researchers from the Institute of Development Studies in Brighton, UK and the Development Research Initiative in Bangladesh led the external evaluation of the BKBT campaign. The consortium employed a mixed methods approach to assess the BKBT's contribution to 1) better snack food choices among adolescents and 2) adolescents' motivations and actions towards building a social movement for improving the availability of nutritious snacks. The evaluation aimed to clarify the pathways

¹ <https://www.bhalokhabobhalothakbo.com/>

² <https://www.facebook.com/BhaloKhaboBhaloThakbo/videos/125661662105933>

through which these changes were achieved according to BKBT's Theory of Change (ToC). The ToC kept constantly evolving to reflect the emerging evidence collected as part of the campaign's monitoring and evaluation and critical contextual changes such as the COVID-19 pandemic. Treating the ToC as a living document facilitated structured learning and reflection about the campaign activities (see Box 2).

At baseline, data collection included eight focus group discussions with adolescents, 24 in-depth interviews with vendors and a survey with students (n=1,377), parents (n=858), school head teachers (n=20) and food vendors (n=74). For the endline data collection, the consortium conducted surveys with students (n=637) and parents (n=349), interviews with adolescents who had engaged with BKBT activities (n=38), head teachers (n=4), government officials, UN/NGO partners and the food industry (n=10) and an online survey posted on the campaign's Facebook page (n=2,951). Here, findings related to the following are discussed: 1) the campaign's reach, 2) adolescents' understanding of the campaign's narrative and goal and 3) adolescents' understanding of the pledge. The findings related to intermediate outcomes and behaviour change will be presented in an upcoming paper.

The campaign's reach

The BKBT campaign was in large part designed to be a social media-based campaign. The quantitative baseline assessment found that only few adolescents (16%) had access to the internet and even fewer (5%) regularly looked at Facebook. Qualitative baseline findings suggested that most adolescents did not have access to computers or mobile phones with internet connections and/or could not afford to pay for data connection packages. Moreover, most parents restricted access to Facebook as they feared it would interfere with study time. Thus, the baseline assessment concluded that the limited access to social media could pose a major barrier to the reach of the BKBT campaign. Based on these findings, the campaign strengthened its school-based activities which were held until school closures came into place.

Following the outbreak of the COVID-19 pandemic, and as a response to online schooling, adolescents' access to the internet and Facebook increased considerably. In the endline survey, about half of adolescents reported increased access to the internet and greater use of Facebook. School closures and the shift to online schooling also changed the attitudes of many parents towards the internet. Adolescents reported that they experienced less parental and financial restrictions when accessing the internet and Facebook as compared to before the pandemic. Many adolescents explained that they learned about the campaign when browsing Facebook and that they were attracted to, and actively participated in, the specific campaign activities advertised there (e.g., the healthy soup contest or the healthy breakfast contest).

Endline results suggest the increased effectiveness of social media as a delivery channel of the campaign. According to findings from an endline online survey (results not shown), cam-

paign activities delivered via social media reached and engaged older adolescents and young adults and young people who were already frequent social media users. However, the campaign's reach via social media was limited for younger adolescents (<15 y) probably due to a more restricted access to internet.

Understanding of the campaign's narrative and goal

The qualitative endline survey suggested that adolescents who actively engaged with the campaign supported different narratives of the campaign. Most of these narratives focused on individual behaviour change towards healthier food choices among adolescents including the framing of BKBT as an educational campaign aimed at raising young people's general awareness of the importance of eating nutritious foods to stay healthy, consuming more home-cooked foods and avoiding snacks and foods from outside the home. This finding was supported by the quantitative endline survey and the online survey in which 89% and 81% of adolescents respectively understood the campaign as an effort to encourage adolescents to eat nutritious snacks.

Adolescents discussed many reasons for their engagement with the campaign in the qualitative evaluation including desires to learn about nutrition, altruistic ambitions to change society by promoting healthy eating for all and COVID-19 related concerns/opportunities (i.e., having more free time to engage). As expected, due to the campaign's shift to focusing on individual actions, there was limited evidence of adolescents engaging out of an eagerness 'to collaboratively wanting to change the way food is produced, manufactured and sold' in Bangladesh (a goal of the campaign stated on the pledge).

Understanding of the pledge

According to the survey results, adolescents took the pledge mostly to motivate themselves to eat nutritious snacks (89% of boys, 84% of girls) and because their peers, teachers and parents encouraged them to take the pledge. In line with these results, the qualitative endline assessment found that many adolescents took the pledge as an individual goal setting strategy that provided a practical approach to translate their desire to improve their diets into action and to support adherence to these behaviours.

Successes, challenges and lessons learned

BKBT inspired a group of adolescents in Bangladesh to articulate and express their dreams for their lives and to realise the connection between nourishing their bodies with nutritious foods and fulfilling their dreams in the future. The campaign's narrative around life chances, dreams and aspirations resonated with adolescents and motivated and inspired over one million adolescents to take the BKBT pledge. The campaign successfully used everyday life motivations to build a narrative that resonated with various sub-groups of the target audience (i.e., boys, girls, younger and older adolescents from different areas and socioeconomic status groups).

In the post-pledge phase, the campaign implemented activities to maintain the saliency of the pledge commitment. For instance, BKBT's online platform provided feedback and acknowledgement to the participants who engaged in the campaign activities, detailed instructions and guidance on how to put the pledge commitment into practice on a regular basis and allowed adolescents to share testimonies and success stories. This highlights the importance of providing continuous support and guidance to pledgers, recognising the need to maintain their motivation and to help them to build the knowledge and skills needed to continuously seek nutritious foods.

The baseline and monitoring results flagged the limited reach of the early campaign activities, especially among younger adolescents. This was largely linked to the limited reach of social media, radio and offline channels amongst certain groups of the campaign's target audience. While online delivery channels may be suitable platforms for future campaigns among young adults/university students, other platforms such as schools may be more appropriate to reach and engage younger adolescents.

Conclusion and next steps

BKBT was able to create an engaging narrative and pledge to bring awareness and motivate adolescents to make better food choices. As it progresses, the campaign will continue to monitor the results and challenges posed by the new reality of the pandemic while maintaining a flexible approach to adapt to local circumstances. The independent evaluation helped to test and refine some of the assumptions made during the design of the campaign. It highlighted the importance of understanding the reality of different sub-groups of the target audience, particularly younger adolescents, to ensure adequate reach and the framing of messages.

BKBT has amassed a critical and enthusiastic group of adolescents with interest and motivation for improved nutrition. At the national level, and in partnership with the government, it seeks to co-design and implement activities aligned with the National Adolescent Health Strategy. At the global level and capitalising on the momentum built by the United Nations Food Systems Summit, BKBT helped to inspire Act4Food, Act4Change, an initiative of global youth advocates for food systems change. As the next steps, it will continue to collaborate with this initiative.

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Adolescent Girl Power Groups in Bangladesh: Placing gender equality at the centre of nutrition interventions

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An adolescent sensitising the community on COVID-19 using a megaphone, Thakurgaon District, Bangladesh

BANGLADESH

What this article is about: Deeply entrenched gender norms in Bangladesh result in discriminatory attitudes and practices that affect the ability of girls to fulfil their right to good nutrition. The article presents the impact of Adolescent Girl Power Groups (AGPGs) promoted by a multi-year maternal and child health and nutrition project in Thakurgaon district, Bangladesh. The AGPG intervention resulted in improved nutrition practices and in shifting gender power dynamics at household and community levels.

Key messages:

- An empowerment approach that puts gender equality at the centre of multi-sector responses to nutrition is critical to breaking intergenerational cycles of malnutrition in Bangladesh.
- Girls need to exercise agency over strategic life decisions, have access to and control over resources and experience informal and formal structures around them as enabling their opportunity to improve their right to good nutrition.
- The AGPG model is an effective approach to empower adolescent girls to claim their nutrition-related rights and act as agents of change in their families and communities.

Background

Adolescent girls in Bangladesh face numerous threats to both their nutritional wellbeing and their human rights including gender-based violence (GBV), gender-based food taboos and child, early and forced marriage (CEFM). Bangladesh has the third highest rate of child marriage globally with 59% of young women married before 18 years of age (UNICEF, 2020). CEFM is a driver of early childbearing with pregnancy at an early age and close birth spacing both contributing to high rates of malnutrition among adolescent girls, with national estimates from 2014 reporting stunting at 26% and underweight at 11% (GAIN, 2018). Adolescent girls also experience high levels of micronutrient deficiencies which are particularly critical for pregnant adolescents as the risk of maternal

mortality is doubled for pregnant women with anaemia (Daru et al, 2018). Pregnant adolescents are also more likely to give birth to premature and low birth weight babies. These infants are more likely to suffer from subsequent stunting during childhood and give birth to small infants themselves, creating an intergenerational cycle of undernutrition. Ending the practice of early marriage and ensuring optimal adolescent nutrition is fundamental to improving the nutrition of girls and future generations.

In Bangladesh, gender norms tend to result in discriminatory attitudes and practices that affect girls' ability to fulfil their right to good nutrition. Cultural bias towards sons negatively impacts resources invested in girls' nutrition and contributes to parents' perception of daughters as an economic burden and their

marriage ability as an ‘asset’. Less than half of Bangladeshi females 10-49 years of age have access to an adequately diverse diet and adolescent girls (aged 10-16 years) are at least twice as likely as boys to go to sleep hungry, skip meals and take smaller meals (GAIN, 2018). Gender inequality is thus both a cause and a consequence of malnutrition among adolescent girls in Bangladesh.

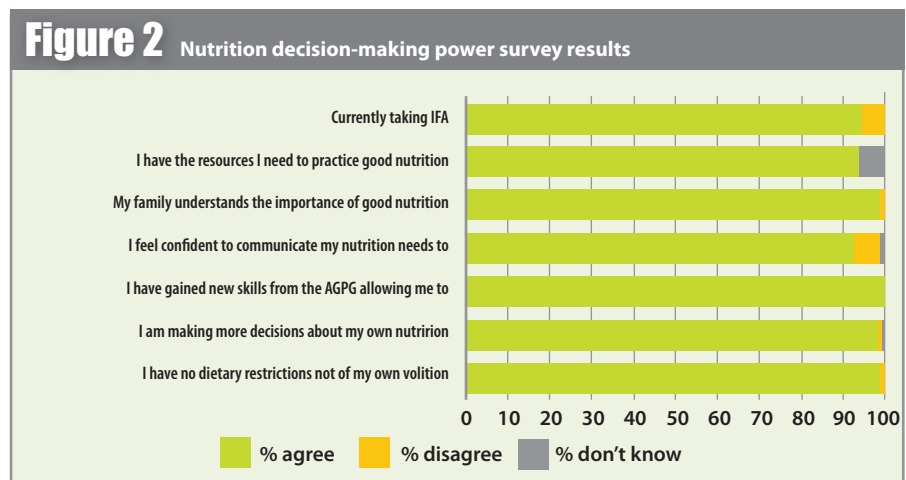
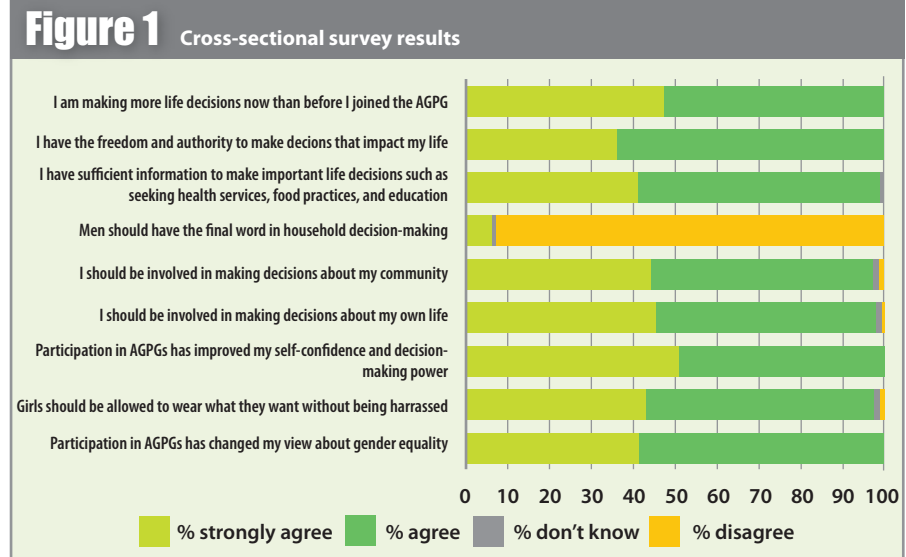
A gender-based analysis, conducted in March 2018 by World Vision (not publicly available), revealed that adolescent girls continue to be restricted by longstanding social norms. It was found that within this patriarchal community men typically make decisions regarding food consumption, education, CEFM and health issues and primarily control and manage the resources that influence nutrition-related decisions for both their daughters and wives. In addition, women and girls have poor access to information about nutrition and have few avenues to shape nutrition services or policies. Within this context, World Vision identified that placing gender equality at the centre of nutrition interventions was essential. Girls who have control over their diet are less likely to suffer from anaemia, miss fewer days of school, have better school performance and have more energy (Nutrition International, 2019). Giving girls agency over their diet and sexual and reproductive health and rights (SRHR) helps girls to avoid unintended pregnancies, attain higher levels of education and has a significant impact on their overall wellbeing throughout their lifetime and for subsequent generations.

Programme description

In 2016, World Vision launched the ‘Enhancing Nutrition Services to Improve Maternal and Child Health in Africa and Asia (ENRICH)’ project in Thakurgaon District, Bangladesh. The five-year project, implemented in partnership with Nutrition International and Harvest Plus and funded by Global Affairs Canada, aimed to reduce maternal and under-five child mortality through nutrition-specific and nutrition-sensitive interventions to reduce malnutrition in the first 1,000 days of life. The project added a focus on adolescent SRHR and nutrition in 2017.

ENRICH sought to address the discriminatory gender norms that impacted the ability of girls to fulfil their right to good nutrition by overcoming systemic barriers and empowering girls to make their own strategic life decisions (Batliwala & Pittman, 2010; O’Leary et al, 2020). The foundation for the intervention was to understand that girls needed support to define and act on their own goals, alongside ensuring that they had access to and control over the necessary resources and had an environment around them that championed their rights to good nutrition.

ENRICH established Adolescent Girl Power Groups (AGPGs) in five sub-districts of Thakurgaon district of Rangpur to equip adolescent girls with the knowledge, skills and confidence to serve as change agents and promoters of gender equality. Overall, 16 AGPGs were established, reaching a total of 320 girls. Initially, the



project conducted community meetings in villages with parents and adolescent girls to gain buy-in and select group members. AGPG participants had to meet the following criteria: school-going adolescent girl, aged 10-19 years, unmarried, living within one of the designated communities and willingness to participate. All ENRICH project staff were trained on the AGPG approach and key discussion topics. From these, 16 female ENRICH project officers were selected as AGPG community facilitators to mentor the groups and support meetings. The training covered basic nutrition topics, SRHR, a male engagement model – MenCare (World Vision, 2013) – and women’s and girl’s rights.

The AGPG activities used a co-design process, allowing members to define the group priorities and agendas for each meeting. Each AGPG democratically elected their leader and met monthly in members’ homes with bimonthly progress meetings held to follow up and plan future meetings. Facilitators assisted with AGPG goal setting and achievement, including developing and reviewing personalised, individual action plans. The AGPG participants received multiple training sessions (over approximately 10 days) on topics such as gender equality, life skills, SRHR and adolescent nutrition. Following the training, the AGPGs were provided with pictorial flip charts and guides for group discussions.

To promote girls’ access to and control over resources, AGPG members were supported with financial literacy and mobilised within the groups to practice individual and collective savings. These collective savings were used for group activities and occasionally to help members within the group. Although most of the AGPG members received a one-off vegetable seed donation, the decision to turn these into income-generating activities (IGAs) (by investing in additional tools from their savings) was entirely led by the adolescents themselves. ENRICH also established community-based nutrition gardens and the girls received health services from their local community clinics including a regular supply of iron and folic acid (IFA) tablets.

ENRICH also worked with parents to champion girls’ rights by, among other activities, promoting intergenerational dialogues. Girls were guided through sessions on how to advocate for their needs and how to make informed life decisions. Alongside this, ENRICH implemented the MenCare Model where men were trained on gender equality and essential nutrition actions and were encouraged to change their perceptions about traditional gender norms. Community facilitators also acted as a liaison between the girls and their parents, discussing issues such as birth registration, GBV and female access to education.



AGPG lead educating an adolescent on Mensural Hygiene Management, January 2020, ENRICH Bangladesh, Thakurgaon District, Bangladesh

The AGPG intervention was also complemented by other supportive activities to tackle gender-based sociocultural norms such as engagement with religious leaders. AGPGs spread awareness of nutrition and gender equality issues through community and school-based outreach activities such as community theatre.

Finally, the project targeted formal institutions and regulatory frameworks that created barriers for adolescent girls. This included campaigns organised by AGPG members to advocate for gender-responsive and adolescent-friendly SRHR services. Some AGPGs were also supported to establish relationships and communication with relevant government agencies (for example, health units, women's affairs, police administration) as well as strategically selected civil society organisations. For example, the AGPG members advocated for and coordinated with health units to organise health camps providing free treatment to the community. Similarly, the project coordinated stakeholders to campaign against GBV and CEFM and push local government to act.

From 24th March to 31st May 2020, the government imposed a lockdown because of the COVID-19 pandemic and restrictions were placed on gatherings. Most in-person AGPG meetings and activities were put on hold, shifting to virtual engagements, with in-person activities allowed to restart in July 2020, following social distance protocols.

In September 2020, a cross-sectional survey was conducted among all 320 AGPG members (aged 11-22 years) to assess the contribution of the AGPG model to the adolescent girls' agency and power. Additional qualitative methods included focus group discussions and key informant interviews with AGPG members, leaders and parents. A second quantitative survey was conducted in July 2021 using a web-based data collection tool. The sample included 160 randomly sampled adolescent girls.

Results/outcomes

The AGPG initiative reached 320 adolescent girls directly and 31,294 girls indirectly. The groups were formed in mid-April 2018 and the same groups continued to operate until the completion of the project in June 2021. Over the three-year implementation, there was only one adolescent who dropped out when she got married at the age of 19. In general, older members of the group did not leave but instead took on leadership roles within the groups.

The results of the surveys indicated that AGPGs increased the power, agency and status of participating girls within their families and communities. The cross-sectional survey results (Figure 1) concluded that participation in the AGPGs had changed adolescent girls' views about gender equality with most girls rejecting gender-based stereotypes and expectations. A strong rejection of male-dominated decision-making was expressed and girls reported making more positive life decisions now than before they had joined the AGPGs.

The AGPGs have contributed to this change by empowering adolescent girls through increased knowledge and confidence and by influencing health-seeking behaviour. Frequently cited changes were improved hygiene practices and more regular consumption of foods with higher nutritional value. Moreover, many AGPG members now report that they attend health facilities to collect IFA tablets and seek advice.

The results also suggest that the AGPGs were instrumental in shifting some gender dynamics inside households. Girls and parents spoke about how daughters were comfortable advocating for themselves and parents had become more responsive to their daughters' opinions, with most being opposed to harmful practices such as CEFM, dowry and GBV. Parents said they noticed an increase in their daughters' ability to add their voices to family discussions since joining the AGPG. The majority of girls agreed that sharing these opinions translated into real change as their opinions were taken seriously by their parents. Parents confirmed that daughters were influencing household decisions such as the consumption of rice biofortified with zinc. As a father of an AGPG participant expressed, "Previously, I thought that parents have sole authority to decide about the children. But now I've started to give importance to my daughter's opinion. I do listen to her."

During the second survey, participants also reported more control over decisions related to diet with 87% of girls stating that they make their own decisions about what, when or how much they ate. The majority of girls (84%) said they experienced a change in this norm since joining the AGPGs. Although in 81% of households the father eats first, 58% of girls stated that they experienced a change in this practice since joining the AGPGs with more families eating meals together at the same time and fathers ensuring that food was available for

everyone in the household. Furthermore, 99% of girls stated that they currently did not have any dietary restrictions that were not of their own volition, with 81% explaining that this was a change since joining the AGPG. Significant progress was made in decision-making power related to nutrition practices (Figure 2).

The AGPGs also contributed to economic empowerment, granting girls more control over financial resources and supporting IGA within the groups. Furthermore, as the girls participated in the IGA during their leisure time, no negative impacts on schooling were observed. Anecdotally, there was a positive impact on schooling and more broadly. As one girl noted during the focus group discussions, "In the past, girls had no choice to buy anything without family permission. Now they can do it by their own decision." In the quantitative survey conducted in 2021, the AGPG members specifically reported more decision-making power over financial resources with 94% of girls reporting that they could make their own decisions about what to do with the money they received. Significant shifts were also noted concerning parent's attitudes towards girls' education and their status within the family. Increased freedom of movement was also referenced as an example of shifting attitudes resulting in expanding opportunities for girls.

Survey respondents referred to the AGPGs as a source of collective power that has catalysed positive changes in their communities. As a group, the AGPG members identified strategies to challenge discriminatory gender norms and promote gender-responsive health, nutrition and hygiene practices. The community has come to view the AGPGs as a source of trusted information that can help to solve some community-level problems. The facilitators spoke of the collective impact of the AGPG, "One person's voice can be refused, but if 20 girls raise the same voice, it will be accepted." AGPG community facilitators also attribute some of the progress that the groups have achieved to the existing rapport between World Vision and the families already involved with the ENRICH project. The AGPG's connection to World Vision and the ENRICH project adds credibility to the information shared with their parents, contributing to AGPG status within the community.

Successes, challenges and lessons learned

The project experienced many successes, a few challenges and some important lessons learned. One key success was the active participation and leadership of adolescent girls within the AGPGs. The co-design approach provided girls with opportunities to define group priorities and to interpret success on their terms. An additional success factor was the girls' pre-existing feelings about the need for greater gender equality in their families and communities. For many, this desire to learn more and engage with their community for the sake of creating change was what prompted them to join the group. Future programming should expand on this by creating new opportunities for girl-led initiatives.

Another success was the MenCare model which proved to be a successful approach for engaging community decision-makers, pointing to the need for both approaches (AGPGs and MenCare) to be implemented in the same geographic area. ENRICH also engaged other traditional power-holders, such as faith leaders, through targeted workshops. Although the workshops were effective, more transformative change might have been possible using the Channels of Hope model (World Vision, 2021) and by expanding the target audience to include other decision-makers such as elders and community leaders.

Parental engagement was another success as it helped girls to exercise much of what they were learning in the AGPGs. Parents seemed to perceive this increase in girls' status and position in the community as a boost to their own family status, sharing their sense of pride over community benefits resulting from their daughters' knowledge and instruction.

The income-generating activities for adolescent girls were another success, enabling girls to translate knowledge into action. Parents also cited this intervention as important for building economic resilience within their families during the pandemic. The girls' involvement in IGAs allowed them to generate savings that helped their families to procure basic household items while they had less income. The families also consumed vegetables and eggs from AGPG activities during this time of financial strain. Since IGAs were not intentionally planned in the project activities, future AGPGs should include and expand upon them.

One of the lessons learned from the project was that future activities should consider building on the MenCare approach. While the implementation of the MenCare approach was successful in changing male perceptions about the value of girls in the family, future programming should incorporate specific dialogue tools or guides for fathers to encourage intra-household dialogues. Most fathers said that despite improved communication with their daughters, they still found it challenging to discuss reproductive health topics including menstrual hygiene and family planning. The project also missed an op-

portunity to deliberately engage mothers who have a unique and trusted insight into the obstacles faced by females in their communities. Future programming should mobilise and strengthen women's groups.

Given the entrenched gender norms in Bangladesh, the project encountered some challenges when targeting gender-transformative attitude shifts. Initially, the campaign against CEFM was faced with community resistance. Some community members felt that since this was a long-standing practice for generations, there were no problems with it. MenCare leaders were instrumental in meeting with these community members to support a better understanding of the risks involved in child marriage. The project also faced some resistance from elders in the community who felt that adolescent girls should not play a role in educating elderly people. The community facilitators played a part in resolving this challenge over time.

Although the onset of the COVID-19 pandemic introduced new challenges, participation in the AGPGs brought several benefits to the girls and their families, strengthening their resilience to the pandemic's impacts. AGPG members were instrumental in disseminating critical COVID-19 information received from the AGPG groups. Although the girls were not meeting in-person, they received emotional and psychosocial support from AGPG facilitators and continued to connect with AGPG friends via mobile devices during isolation.

Finally, adolescent girls were at increased risk of GBV during the pandemic and AGPG facilitators felt that the open conversations within families about resolving conflict helped to lower the rates of GBV in AGPG families. More inclusive communication and decision-making that considered the needs of daughters, discouraged GBV, raised awareness of the negative impacts of early marriage and improved knowledge about cost-effective and nutritious foods are likely to have helped to protect girls during the lockdown.

Conclusion

The results of the project highlight the potential

for the AGPG model to empower adolescent girls to claim their nutrition-related rights and act as agents of change in their families and communities. The AGPG model points to the transformative power of an empowerment approach and ultimately demonstrates that progress towards improved nutrition outcomes is possible when girls exercise their agency over strategic life decisions, have access to and control over resources and experience the informal and formal structures around them as enabling their opportunity to improve their right to good nutrition.

The approach has resulted in a strong promise for sustainability. Alongside the knowledge and skills to continue their advocacy efforts, the AGPGs have demonstrated significant motivation to continue working together. The groups have prepared their annual plans through to the end of 2021 and are continuing to follow their implementation even in the absence of support from ENRICH project staff. The financial literacy and saving skills, along with their IGAs, will continue to ensure that the girls can access and control the financial resources that they need to act upon their goals. Finally, as part of the hand-over and sustainability activities, ENRICH conducted meetings with multiple stakeholders to identify options to sustain interventions beyond the project's life. To date, significant progress has been made towards embedding the AGPGs within both government structures and community-based mechanisms. Additionally, the project has linked AGPGs with community clinics for the ongoing supply of IFA and access to health services.

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Adolescent Power Group Members after a group session, Thakurgaon District, Bangladesh

An integrated multi-sector approach to improve the nutritional status among school-age children and adolescents in Malawi

Students receive school meals in Malawi

© WFP/Francis Thawani

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MALAWI

What this article is about: This article outlines two programmes – weekly iron and folic acid supplementation for adolescent girls and a nutrition sensitive agriculture programme – which form part of the Malawian government's efforts to optimise adolescent nutrition behaviours.

Key messages:

- Weekly iron and folic acid supplementation achieved high coverage across many schools but was impacted by COVID-19-related restrictions.
- The nutrition sensitive agriculture programme led to steady improvements in adolescent girls meeting minimum dietary diversity standards with the impact of COVID-19 being mitigated through creative learning solutions.
- This integrated, multi-sector approach to adolescent nutrition has proven effective thus far and efforts to scale up are now warranted.

Background

Since joining the Scaling Up Nutrition (SUN) Movement in 2011, Malawi has been implementing 13 high impact SUN interventions for pregnant and lactating women (PLW) and children under five years of age. Despite significant progress in reducing the burden of undernutrition in children under five years of age, poor nutrition in adolescents (10-19 years of age) remains a public health challenge. The Malawi Demographic and Health Survey 2015/16 revealed that approximately 35% of adolescent girls (15-19 years of age) are anaemic while 13% are underweight. In addition, the prevalence of overweight among adolescent girls increased from 4% in 1992 to 7% in 2015/16. School-age children and younger adolescents (6-14 years of age) also face nutritional challenges with anaemia affecting 22% and zinc deficiency affecting 60% of this age group (National Statistical Office Malawi, 2017). Dietary quality for adolescent girls remains suboptimal with only 17% of girls (10-19 years of age) meeting minimum dietary diversity for women (MDD-W) standards (University of Sydney et al, 2019).

Existing nutrition policies and interventions have traditionally focused on the first 1,000 days with less consideration given to the growth and development of adolescents. Stakeholder consultations, led by the Department of Nutrition, HIV and AIDS (DNHA) and including the Departments of Reproductive Health and Nursing in the Ministry of Health and the Ministry of Education, revealed that non-pregnant adolescent girls were neglected from stunting reduction strategies in Malawi.

The Malawi National Multi-Sector Adolescent Nutrition Strategy

In order to guide the implementation of nutrition programmes and interventions, a National Multi-Sector Nutrition Policy (NMSNP) and a National Multi-Sector Nutrition Strategic Plan (NMSNSP) 2018-2022 were developed. To prioritise nutrition programming for adolescents and ensure that they are able to contribute to economic growth and national development, evidence-based advocacy by various stakeholders¹ led to the development of a National Multi-Sector Adolescent Nutrition Strategy (NMSANS) 2019-2023 that aims to improve the nutritional status of both in- and out-of-school adolescents 10-19 years of age. The NMSANS was endorsed by the Nutrition Policy Advisory Team, the Essential Health Package technical working group and the Malawi Cabinet. The NMSANS is aligned to the NMSNP and NMSNSP to address specific nutrition issues affecting adolescents.

The NMSANS has eight priority areas of which four are currently being implemented by the Government of Malawi: **priority area 1:** prevention and control of undernutrition, **priority area 4:** empowerment of adolescents for improved nutrition and livelihoods, **priority area 5:** enhanced social mobilisation and positive behaviour change communication for improved adolescent nutrition and **priority area 6:** other public health interventions.

¹ Government of Malawi, development partners and academia

The NMSANS creates a platform to address the various information needs of adolescents including those related to sexual reproductive rights and life skills thereby contributing to a wider adolescent engagement agenda. This multi-sector collaboration among the various ministries in Malawi has assisted with programme rollout and the integration of adolescent nutrition within the health and education systems proving a sustainable, multi-sector approach to nutrition programming. Table 1 outlines the responsibilities of the various systems involved.

Weekly IFA supplementation for adolescent girls

In 2019, the Ministry of Health's DNHA and Department of Reproductive Health, with support from UNICEF, rolled out a pilot weekly iron folic acid (IFA) programme to adolescent girls in six districts.³ The districts were selected based on the presence of existing UNICEF-supported interventions such as maternal, infant and young child nutrition programmes to leverage existing efficiencies. Adolescent girls 10-19 years of age

were targeted in school and community settings with each girl expected to take 50-52 IFA tablets per year. Following the approval of the NMSANS, key messages were developed and key district and community-level service providers, community leaders and adolescents were sensitised to ensure programme acceptance prior to its implementation.

In schools, a participatory approach was adopted in which each class identified focal adolescent girls who assisted teachers in keeping registers and tracking self-compliance by girls in their classes using self-compliance cards. Every supplementation session was conducted under supervision and with the involvement of either the focal teacher in school or an HSA at community level.

At community level, adolescent nutrition groups were established for those 10-14 and 15-19 years of age. Within these groups, community volunteers and frontline workers facilitated adolescent engagement and participation through nutrition education, counselling, cooking dem-

onstrations and sporting activities. Topics covered included nutrition, livelihoods, sexual and reproductive health and agriculture through the establishment of nutrition demonstration gardens.

Nutrition Sensitive Agriculture (NSA) programme

With support from the World Bank (WB) and the European Union (EU), the Government of Malawi is implementing the NSA programmes in 12 districts where dietary diversity is low.⁴ The WB began a three-year 'Investing in Early Years' programme in 2019 targeting both in- and out-of-school adolescent girls and boys 15-19 years of age in Mwanza and Ntchisi districts. In 2017, the EU implemented a five-year programme targeting infants, PLW and adolescent girls (10-19 years of age) in the remaining 10 districts.

In the EU-supported NSA programme, in- and out-of-school adolescents 15-19 years of age have established nutrition demonstration plots where they learn diverse methods of food production and preservation to ensure the continued availability and variety of safe, seasonal, nutrient-dense foods at the household level. They are taught food preparation techniques through cooking demonstrations using local recipes and locally available foods provided by the community. To further ensure sustainability, community leaders have also contributed farming land for nutrition demonstration plots. Adolescents have contributed to the cooking demonstrations through crops harvested from the demonstration gardens and from the rearing of small stock. In the WB programme, adolescent girls are also given IFA tablets.

The programmes support community social mobilisation and engage in- and out-of-school adolescents to participate in specific community platforms. These take several forms such as teen clubs, youth clubs and adolescent nutrition groups. The NSA programmes are delivered through the internationally recognised care group model comprising PLW and caregivers of children aged under-five. The adolescent nutrition groups were specifically established after evidence showed that out-of-school adolescents did not feel comfortable engaging in the main care groups where nutrition education, counselling and cooking demonstrations were conducted. The frequency of meetings varies from weekly to bimonthly and intensifies during school holidays when more adolescents are present in the community. The groups are led by community nutrition volunteers and peer educators who use counselling cards to discuss various nutrition topics with support from health and agriculture frontline workers and SHN teachers. Nutrition education on dietary diversification using Malawi's six food group model is provided during group meetings and is complemented by education on sexual and reproductive health, WASH and other life skills.

² Malawi six food group model comprises starches/pulses, animal source foods, legumes, vegetables, fruits and fats and oils

³ Mangochi, Dedza, Salima, Lilongwe, Dowa, Machinga

⁴ Mwanza, Ntchisi, Chiradzulu, Thyolo, Mulanje, Kasungu, Salima, Nkhokhota, Nkhata Bay, Mzimba, Karonga and Chitipa

Table 1 Responsibilities of government systems within the adolescent nutrition programme

System	Key stakeholders and their roles and responsibilities
Health system	<p>The Department of Nutrition, HIV and AIDS (DNHA)</p> <ul style="list-style-type: none"> Convenes and chairs the multi-sector national nutrition committee and coordinates the actions and activities of development partners Coordinates and mobilises resources for the adolescent nutrition programme Trains frontline workers (School Health and Nutrition (SHN) teachers and Health Surveillance Assistants (HSAs)) <p>Community Health Nurses (CHN)</p> <ul style="list-style-type: none"> Receive and distribute iron folic acid (IFA) tablets to all schools within a health facility's catchment area Supervise HSAs Consolidate monthly reports from schools and community platforms for submission to the district <p>HSAs</p> <ul style="list-style-type: none"> Administer IFA and deworming tablets to out-of-school adolescent girls at designated locations within communities Compile monthly reports from the community platform for submission to the health facility Serve as a direct link between the health system and the education system
Education system	<p>Ministry of Education</p> <ul style="list-style-type: none"> Facilitates the integration of the NMSANS into the existing school health and nutrition platforms of the education system Provides a platform and an enabling environment for the successful delivery of the adolescent nutrition programme <p>SHN teachers</p> <ul style="list-style-type: none"> Manage stocks of IFA and deworming tablets within the school premises Provide health education talks and individual counselling to learners Administer weekly IFA and deworming tablets once a year Support the capacity-building of adolescent girls (in-school) in the production of nutritious foods and rearing of small stock Compile weekly and monthly reports for submission to the nearest health facility
WASH System	<p>Ministry of Agriculture, Irrigation and Water Development</p> <ul style="list-style-type: none"> Coordinates the water, sanitation and hygiene (WASH) interventions in schools and communities Provides access to safe water supplies and sanitation facilities in schools
Food System	<p>Ministry of Agriculture, Irrigation and Water Development</p> <ul style="list-style-type: none"> Facilitates the inclusion of adolescent nutrition activities into the agriculture, food and nutrition security strategic documents Creates an enabling environment for the rollout of agriculture sector-specific adolescent nutrition interventions <p>Agriculture Extension Development Officers (AEDO)</p> <ul style="list-style-type: none"> Support the capacity-building of adolescent girls (out-of-school) in the production of nutritious foods and rearing of small stock Promote the consumption of diversified, safe and nutritious foods using the Malawi 'six food group' model² among adolescents Promote skills acquisition in food processing and meal preparation for improved nutrition

Monitoring and evaluation

The Government of Malawi developed various monitoring tools for the IFA programme to collect monthly data on coverage, compliance and dietary diversification practices at community and school levels. The tools were developed by multi-sector teams in the technical working group and include:

- Self-compliance cards: used by adolescent girls to record weekly IFA intake
- Weekly registers for community and school platforms: used by HSAs and teachers respectively to record weekly IFA intake by adolescent girls
- Monthly community and school reports: used to collect indicators on IFA coverage and compliance (IFA intake in all weeks of the month). These are the primary indicators for the programme describing the percentage reached with IFA tablets and monthly intake by adolescent girls
- Commodity stock books: used to record the movement of supplies at health facility and school levels to prevent stockouts

For the NSA programme, a monitoring and evaluation framework was developed, the data from which contributes to the monitoring of national nutrition indicators.

Results

Weekly IFA supplementation

The weekly IFA supplementation programme reached 70% of adolescent girls in 1,788 schools and 192 health facilities in 2019 and 47% in 2020, due to COVID-19 related school closures. The preliminary results in 2020 revealed that over 36% of adolescent girls achieved monthly compliance (girls consuming four or five tablets⁵ a month) for the six months that they received supplements before and after school closures.

NSA programme

Out of a targeted 2,725 adolescent nutrition groups 2,013 were established between January 2019 and March 2021 with the establishment of groups continuing until December 2021. As of March 2021, over 55,903 adolescents were members of the adolescent nutrition groups and an estimated 378,995 adolescents have benefited from nutrition extension services including nutrition education, WASH and reproductive health. Over 617 cooking demonstrations have been conducted, providing 7,492 adolescents with knowledge and skills around food preparation, preservation and utilisation.

Steady improvements in MDD-W have been demonstrated, increasing from 32% to 47% for adolescent girls between 2018 and 2021 (University of Sydney et al, 2019; FAO and UNICEF, 2021). Programme reach was maintained during the COVID-19 pandemic by migrating nutrition education and trainings to mobile phones and included messages promoting diversified diets as key to strengthening the immune system. Results from knowledge, attitude and practices (KAP) surveys in 2020 and 2021 indicated that consumption of biofortified foods such as Vitamin A-fortified maize, iron-fortified beans and orange-fleshed sweet potatoes increased from 12% to 19% (FAO

and UNICEF, 2020; FAO and UNICEF, 2021). While the consumption of animal-source foods has declined from 51% to 33% over the past few years (University of Sydney et al, 2019; FAO and UNICEF, 2020), efforts to change behaviour and improve access to small livestock have been credited for a recent increase to 39% (FAO and UNICEF, 2021). During qualitative interviews, community members explained that households prefer not to slaughter their livestock for food but would rather sell their livestock to buy relatively cheaper sources of protein.

Qualitative data from the 2021 KAP survey also suggested that the adolescent groups are an important platform for girls to access nutrition-related information (FAO and UNICEF, 2021). Adolescent groups participating in the survey demonstrated increased knowledge since the previous survey in relation to the importance of the six food groups, the role of nutrition-sensitive agriculture in the production and consumption of iron-rich foods, optimal maternal and child feeding practices and barriers to good nutrition including food taboos (FAO and UNICEF, 2021).

Successes

To ensure programme acceptance and success and to maximise benefits, adolescent girls were carefully and intentionally involved in the design and implementation of the IFA intervention. The primary messages and information, education and communication materials for the intervention were designed by technical experts but reviewed by adolescent girls whose recommendations were incorporated to make the materials more adolescent-friendly.

The creation of adolescent nutrition groups has facilitated the inclusion of adolescents in nutrition programmes. Incorporating sporting activities like netball and football as well as nutrition demonstration plots, sexual reproductive health education and cooking demonstrations has encouraged adolescents' participation. Adolescent nutrition groups have been particularly useful for out-of-school adolescents who may have additional needs, such as psychosocial support, that can be addressed through greater engagement and the necessary referrals at the community level. Previously, Malawi lacked a standardised approach towards nutrition education for adolescents. However, through the development and rollout of the adolescent NSA package, coherent and comprehensive nutrition education has been provided to adolescents using a counselling package for adolescent engagement.

Challenges

There is limited data for adolescent boys and girls 10-14 years of age resulting in a lack of evidence for ongoing resource mobilisation to address their nutritional challenges. Coordination challenges between education and health systems occurred at service delivery level, especially for reporting. To address this issue, review meetings among service providers were regularly conducted, focusing on the roles for each sector in programme implementation.

Closure of schools due to the COVID-19 pandemic affected IFA coverage and compliance for

the school platform. This resulted in DNHA developing standard operating procedures for nutrition activities in the context of COVID-19 that included the implementation of the adolescent nutrition programme. Some adolescent girls were reached through the community platform during school closures. However, more efforts are required to engage out-of-school adolescents including exploring working with the Department of Youth, youth clubs and organisations.

Conclusion and next steps

The integrated multi-sector approach to improving the nutritional status of adolescents in Malawi has proved effective and promises to make a significant contribution to national development. Moving forward, under the leadership of the Government of Malawi, efforts are being made to ensure that the adolescent nutrition programme is scaled up in a phased approach:

- 2019-2020 six districts
- 2020-2021 additional nine districts (15 districts in total)
- 2021-2022 additional 13 districts (nation wide coverage)

Efforts are also being made to bring more partners on board to expand the programme. There are also plans to ensure that the dietary diversification programme features a holistic package of interventions including IFA supplementation for out-of-school girls. It will be important to engage adolescents in two groups, 10-14 and 15-19 years of age, to ensure age-appropriate information is shared and suitable teaching methods are used. In the long-term, the Government of Malawi hopes to include the adolescent nutrition programme under the normal government procurement system so that it can be sufficiently budgeted and financed. At district level, this is currently being lobbied by the Department of Nutrition through the launch of SUN 3.0 to ensure the sustainability of the programme.

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⁵ Four tablets if the month has four weeks and five tablets if the month has five weeks

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Nutritious food consumption, Ibarra, Ecuador



Preventing teen pregnancies and supporting pregnant teenagers in Ecuador

ECUADOR

What this article is about: A pilot project demonstrated that a cash-based transfer (CBT) accompanied by nutrition education had the potential to increase the dietary diversity of and attendance to antenatal care by pregnant adolescent girls.

Key messages:

- The findings from this project suggest that a comprehensive CBT package can improve dietary diversity and promote the use of health services among pregnant adolescents.
- WFP could not fully leverage the existing government platforms for cash transfers as targeted participants were below 18 years of age, preventing a potential scale-up of the project.
- The findings from this case study will serve as an advocacy tool to continue work with the government of Ecuador to improve the comprehensive policy of prevention and care of pregnancy in girls and adolescents and its implementation on the ground.

Background

Ecuador has the second-highest rate of adolescent pregnancy in the Latin America and Caribbean region, with 19.6% of births being among mothers below 20 years of age (INEC, 2018). Babies born to young mothers face a higher risk of preterm birth, low birth weight and short stature (INEC, 2018). The risk of adolescent pregnancy is greater for those living in very poor households, not enrolled in school or who experience sexual abuse during childhood and adolescence (Espinel-Flores et al, 2020). Girls from indigenous communities are also disproportionately affected.¹

The double burden of malnutrition is a common phenomenon in Ecuador. Nationally, 17.9% of adolescents aged between 12 and 14 years and 20.8% of adolescents between 15 and 19 years are stunted. Simultaneously, overweight and

obesity are high, with 26% of adolescents affected (INEC, 2012). While stunting rates are higher in the poorest quintile, overweight is more common in the richest quintile.

Pregnant adolescents have an increased risk of nutritional shortfalls as their own requirements for optimal height and pelvic growth interfere with those of their children's development. In turn, undernourished mothers are more likely to give birth to infants with low birth weight, micronutrient deficiency and who – if they survive childhood – experience poor health throughout their life, perpetuating a cycle of poverty, deprivation and malnutrition. At the same time, maternal overweight and

¹ In 2019, 13.7% of mothers below the age of 20 years were identified as "white". This rate increased to 23.4% amongst "indigenous", 23.9% among "black" and 18.3% among "mixed-race".

obesity result in increased maternal morbidity and infant mortality (Black et al, 2013). Adolescent pregnancy also derails the development trajectory of girls, affecting their physical, cognitive and mental health. This forces them out of school which reduces their chances of accessing stable jobs, livelihoods and incomes.

Addressing the problems associated with adolescent pregnancy requires the application of a comprehensive, multi-sector and inter-institutional perspective that considers different dimensions, including that of food and nutritional security. To generate evidence that contributes to strengthening public policies for the prevention and care of adolescent pregnancy, the World Food Programme (WFP), together with the United Nations Population Fund (UNFPA) and the Ministry of Economic and Social Inclusion (MIES) led a pilot project in 2019 in the provinces of the northern Ecuadorian border. This article summarises the main results, findings and lessons learned.

Project description

Project rationale

In 2018, the government of Ecuador launched *Misión Ternura*,² a multi-stakeholder strategy that aimed to promote early childhood development across the health, education and protection sectors. To address the issue of early pregnancy, the government formulated an intersectoral policy document³ which offers a platform for the development of national solutions to address the social, economic and cultural drivers of early pregnancy – including improvements to the judicial system for the protection of girls and adolescents against sexual and gender-based violence.

During the same year, WFP conducted a “Fill the Nutrient Gap” (FNG) analysis which revealed that, among all household members, the cost of a nutritious diet for adolescent girls was the highest (39% of the total cost). The analysis also indicated that, by providing micro-nutrient supplements (iron and folic acid) to adolescent girls, the gap in the cost of a nutritious diet could be reduced by 53% from USD3.50 to USD1.65 per day.

In 2019, WFP worked in close collaboration with the MIES, the Ministry of Public Health (MoPH), the Ministry of Education (MoE), UNFPA and the international non-government organisation, Plan International, to design a cash-based transfer (CBT) pilot project that aimed to contribute to the promotion of food security, nutrition and sexual and reproductive rights among adolescents. The CBT project was implemented from July to December 2019 and incorporated into the *Misión Ternura* framework and the 2018-2025 Intersectoral Policy.

Project design

The objectives of the project were to increase national awareness and to generate evidence to inform interventions and public policies for pregnant adolescent girls by improving access to healthy diets while preventing other early

pregnancies. The project was implemented in the northern provinces of *Carchi*, *Imbabura*, *Sucumbios* and *Esmeraldas* where adolescent pregnancy and gender-based violence are of concern. WFP coordinated with the MIES to identify the most economically vulnerable (poor or extremely poor) pregnant girls up to 19 years of age, prioritising those who were up to six months pregnant. Among the girls targeted, 11% were aged 14 years or younger and 59% were from the Esmeraldas province. Most of these adolescents lived in rural or peri-urban areas with no or low access to communication methods and with limited access to transportation.

Project interventions

The pregnant adolescents enrolled received monthly unconditional and unrestricted CBTs (USD50) over the six-month period of the pilot project. The value of the transfer was intended to cover the gap in accessing a nutritious diet based on the FNG analysis recommendations. The amount of the transfer was the same as the one provided as part of the national social protection programme to the most vulnerable households.⁴ Pregnant adolescents also received a birth kit that included diapers, baby clothing, a carrier blanket and a booklet that contained key messages on food security, nutrition and feeding practices (including the benefits of breastfeeding) and on sexual and gender-based violence. Pregnant adolescents were consulted to define the content of this birth kit.

WFP opted to provide assistance in the form of cash to enable adolescents to make critical decisions and to purchase locally grown foods. An agreement with a financial provider (Banco del Pichincha) was put in place to deliver the monthly CBT to the beneficiaries. Those under 18 years of age had to assign an elder (usually their mother) to be able to withdraw the cash.

Nutrition education sessions for pregnant adolescents and their families were organised to complement the cash distribution and to facilitate social and behaviour change communication (SBCC). Educators from MIES carried out monthly home visits to encourage beneficiaries to use the cash transfers to purchase and consume seasonal, nutritious local and fresh foods and to attend regular nutrition education sessions. During their visits, educators also shared standardised messages to promote responsible reproductive health behaviours and rights.

WFP partnered with UNFPA and Plan International to complement the cash distributions with other activities such as workshops and information sessions that promoted capacity-building, knowledge acquisition and skills development related to food security, nutrition and sexual reproductive health. Other workshops in the form of the training of trainers that targeted school staff, health counsellors as well as youth and community leaders were also conducted using a customised *Rurankapak* toolkit.⁵

Monitoring and evaluation data

The bank provided WFP project coordinators with weekly reports of cash withdrawals. The

list of pending withdrawals was then shared with MIES and a project educator visited the homes of adolescents to enquire why the transfer had not been collected and to encourage them to do so.

WFP carried out a baseline survey (July 2019) and an endline project evaluation (December 2019) to generate critical evidence from the six-month pilot and to provide learning to the authorities of Ecuador.

The surveyed individuals were interviewed on questions related to food consumption and attendance at antenatal check-ups. The variables of interest were:

- Minimum diet diversity for women (MDD-W): the proportion of women who had consumed at least five out of the 10 pre-defined food groups the previous day or night.
- Number of antenatal check-ups: number of times adolescent girls attended a health check-up for a presumed healthy pregnancy (screening), to diagnose diseases or complicating obstetric conditions without symptoms or to provide information about lifestyle, pregnancy and delivery.

The baseline survey was conducted among 776 adolescent girls (all participants of the project) while the endline project evaluation was conducted among 191 beneficiaries who had been enrolled in the project. Beneficiaries from the four provinces included in the project were randomly selected. There was no control group.

The endline survey was complemented by 11 focus group discussions that included 87 randomly selected participants from the four provinces. The participants were divided into three groups: two groups were pregnant children (10-14 years) and adolescents (15-19 years) and one was made of students who participated in the prevention workshops organised by UNFPA and the MoE. Informative interviews with 24 key informants from the MIES, the MoPH, the MoE and WFP staff were also undertaken across all the provinces.

Results/outcomes

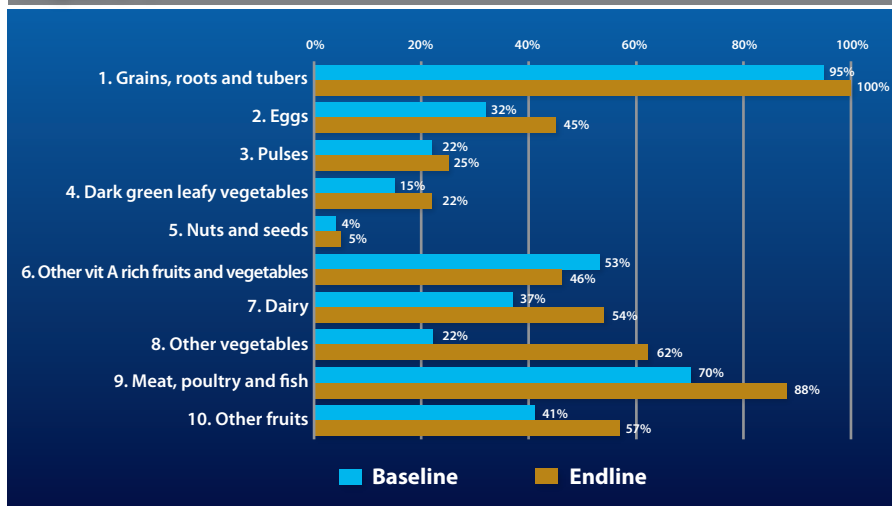
During the six months of the pilot, 776 pregnant teenagers received monthly CBTs and birth kits. Among these, 89% were in the vulnerable and extremely vulnerable category and 34% participated in workshops, received information on sexual and reproductive health, food and nutrition and built a life projection plan. In addition,

² <https://www.todaunavida.gob.ec/politica-mision-ternura/>

³ *Política Intersectorial de Prevención del Embarazo en niñas y adolescentes 2018-2025* (“Intersectoral Policy for the Prevention of Pregnancy in Girls and Adolescents 2018-2025”)

⁴ Bono de Desarrollo Humano (Human Development Bonus) is a cash transfer worth USD50 per month that is delivered to households living in poverty and extreme poverty, as part of the national social protection system. At present, 842,000 families receive this.

⁵ *Rurankapak* is an interactive methodology composed of six modules around sexual reproductive health and the prevention of teenage pregnancy. Two additional modules were developed, one on nutrition and one on the prevention of sexual violence.

Figure 1 Prevalence of pregnant teenagers who consumed each of 10 food groups: baseline and endline result

3,086 students and 458 community leaders were trained on food, nutrition and sexual reproductive health rights. A total of 468 technicians from the MIES, the MoE and the MoPH were trained in the Rurankapak toolkit methodology.

The results of the endline survey revealed that adolescents felt empowered by receiving unconditional cash transfers that allowed them to make their own decisions on how to spend the money. Most beneficiaries across the four provinces responded that they spent this cash mainly on food, followed by sanitary supplies and transport costs for attending medical services, savings, clothes and items for their newborns.

Between baseline and endline, MDD-W increased among pregnant adolescents from 34% to 60%. The average number of food groups consumed increased by 29%, from an average consumption of 3.89 food groups to 5.03 food groups. Specifically, beneficiaries increased their consumption of foods from animal sources such as meat (18%), dairy products (17%) and eggs (13%) (Figure 1). The consumption of fruits and vegetables also increased substantially.

Although the transfer of cash was not linked to any conditionality, the project promoted health check-ups during pregnancy. It was found that 70% of adolescents attended at least five antenatal check-ups. Qualitative data revealed that they understood the importance of using medical services during pregnancy and spent the cash provided to cover transportation costs. The high participation in antenatal check-ups is considered a positive project achievement.

Successes, challenges and lessons learned

What went well

The high rate of teenage pregnancies, alongside the findings from the FNG analysis, prompted the implementation of this pilot project. The MIES showed high interest in collaborating with WFP and partners given the magnitude of the issue and the necessity to develop an approach to break the traditional silos between sectors, both at policy and programmatic levels.

This pilot demonstrated how a cash-based strategy to promote dietary diversification can be successful with adolescent girls, even within a short period of time. The combination of SBCC activities with improved access to diverse and nutrient-rich foods was effective in triggering the change.

Challenges faced

Due to the short duration of the project and limited staff availability, no formal formative research was conducted prior to the start of the intervention. Hence, a formal evidence-based SBCC plan was lacking. Consulting with participants ahead of project implementation would have enabled barriers to behaviour change to be better addressed during sensitisation activities.

Because most adolescents belonged to low-income households and had no access to a phone, reaching them to disseminate information was a challenge. Transportation from remote areas also limited participation from adolescents, either for cash withdrawals or to attend workshops.

Although cash was identified as the best modality to promote autonomy, it could not be directly transferred to adolescents below the age of 18 and hence had to be collected by an adult. The evaluation showed parental control did not prevent adolescent girls from accessing and using the cash as they wanted. However, because the national government cannot provide bonuses or pensions to minors, WFP could not fully leverage the MIES transactional platform⁶ as initially envisioned. This was an obstacle to the potential scale-up of the project.

Lessons learned

Early childbearing and teenage pregnancy are complex issues with multiple causes and diverse consequences. Addressing these requires a multi-dimensional and multi-sector approach that includes sexual reproductive health, child protection, economic, social as well as nutrition considerations, among others. This pilot project was an attempt to contribute to the national intersectoral policy, to generate evidence and to expand coverage. Although important results

and learning were achieved, and the conceptual and methodological basis established with the national authorities, commitment to the prevention of pregnancy in adolescent girls still requires advocacy efforts, resources and mobilisation.

Most pregnancies in girls under the age of 14 are the result of sexual violence, including domestic sexual violence. A specific strategy needs to be in place to address this reality. With 11% of beneficiaries in this age group, this pilot project confirms the need to adapt strategies, guidelines and activities to include a strong child protection component and offer specialised assistance to children up to 14 years of age.

Conclusion

The findings from our pilot suggest that a comprehensive CBT package can improve dietary diversity and promote the use of health services among pregnant adolescents. The nutrition-sensitive cash transfer provided helped adolescent girls to meet their elevated nutrient requirements while stimulating demand for nutritious food. The need for strong linkages between food and social protection systems to support healthy diets for all, and particularly adolescents, is increasingly evident. Better alignment between social protection and food systems would mean that cash can be spent on nutritious foods that are available and affordable.

The implementation of the project ended a few months before the start of the COVID-19 pandemic and general elections were held early 2021. Both events delayed the dissemination of the results until mid-2021 which compelled the government to revisit policy priorities.

The findings derived from this case study will serve as an advocacy tool to pursue the engagement with the MIES and other ministries to improve the comprehensive policy of prevention and care of pregnancy in girls and adolescents and its implementation on the ground.

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⁶ The MIES is the institution that provides unconditional cash transfers that are delivered based on criteria of social vulnerability. For this, the MIES has a "transactional platform" which is a technical tool in which the data of the beneficiaries is included and they can then withdraw the cash at different bank offices, credit unions ("Cooperativas") or associated non-bank establishments.

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“I’m courageous”: a social entrepreneurship programme promoting a healthy diet in young Indonesian people

Ideas presentation gallery at the Saya Pemberani Summit in Jakarta

By Cut Novianti Rachmi, Dhian Probhoyekti Dipo, Eny Kurnia Sari, Lauren Blum, Aang Sutrisna, Gusta Pratama and Wendy Gonzalez



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INDONESIA

What this article is about: This article reflects on the opportunities and challenges of using social entrepreneurship to engage young people in promoting healthy diets.

Key messages:

- Using the social entrepreneurship approach, the Saya Pemberani programme aimed to engage young people living in urban areas to articulate solutions to contextual problems that preclude healthy diets through social media campaigns and mentorship activities.
- While social media was an effective channel to reach young individuals in the programme areas, the participants preferred in-person mentorship sessions as a means to advance their ideas and receive personalised advice.
- According to the participants, the mentorship programme helped them to gain skills on leadership, teamwork, problem solving, critical and creative thinking and communication. The participants also reported becoming more aware and knowledgeable about the importance of, and challenges to, achieving healthy diets.

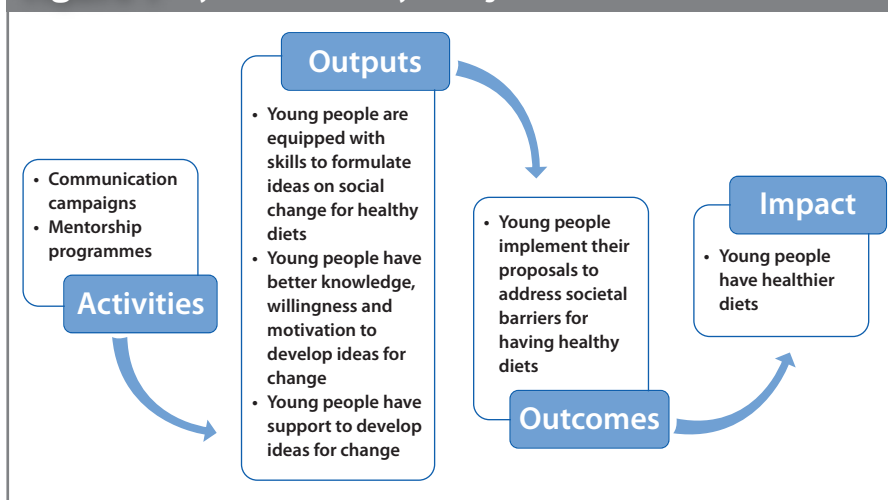
Background

Healthy diets are a prerequisite to achieving the Sustainable Development Goals (SDGs) as they protect against malnutrition in all its forms, as well as noncommunicable diseases (IFPRI, 2016). Healthy diets are required to ensure that the 62 million young people aged 15-29 years in Indonesia, representing 20% of the country’s population, have adequate nutrition to reach their full potential and become productive adults. However, survey data from 2018 showed that 32% of young people 15-24 years of age suffer from anaemia, while 16% of adolescents 13-15 years of age are overweight or obese (National Institute of Health Research and Development Ministry of Health, 2019).

Transforming food systems so that they provide safe, nutritious and affordable food and deliver on the SDGs by 2030 requires action by all, including young people (Glover & Sumberg, 2020) who have the potential to become powerful forces for social change (USAID,

2014). With new technology accelerating the exchange of information and ideas, young people are able to engage in issues they care about and organise themselves to promote change in their societies. Despite these opportunities, young people face a range of barriers to making structural changes related to healthy diets including a lack of involvement in key policy and political decision-making processes affecting their lives (USAID, 2014). Young people are increasingly demanding greater inclusion and meaningful engagement and are taking action to address societal challenges including through social entrepreneurship. Social entrepreneurship aims to create value or generate a positive change on society by offering solutions to social challenges (United Nations, 2020).

Using the social entrepreneurship approach, the *Saya Pemberani* programme (“I’m courageous” in Indonesian) aimed to engage young people living in urban areas in articulating solutions to contextual problems that preclude healthy diets. Teaming up with

Figure 1 Saya Pemberani's theory of change

Ashoka, a non-profit organisation that fosters social entrepreneurship, and in close collaboration with the Indonesian Ministry of Health, the Global Alliance for Improved Nutrition (GAIN) designed and implemented the programme between April 2019 and June 2020 in the city of Surabaya and the Jember district in East Java, Indonesia. This article describes the design, implementation, key results and learnings of the Saya Pemberani programme and reflects on the opportunities and challenges of using social entrepreneurship to engage young people in promoting healthy diets.

Designing and implementing Saya Pemberani

Theory of change: Promoting healthy diets through a social entrepreneurship approach

We hypothesised that if we raised awareness of and motivation for addressing barriers for healthy diets, adolescents would feel encouraged to take action and formulate ideas on social change for healthy diets. By engaging in Saya Pemberani's mentorship programme, adolescents would strengthen the skills needed to turn these ideas into feasible, well-grounded proposals. By involving parents and teachers in this process, the programme would create a supportive interpersonal environment conducive for social change. In the long term, the implementation of these proposals would contribute to improving adolescents' diets. (Figure 1).

Communications campaign: Inviting youth to engage

Saya Pemberani was launched by implementing school workshops and a social media campaign. The communication campaign aimed to raise awareness about the challenges that young people in Indonesia face to eating healthy diets and to transform the role of youth in addressing the barriers to consuming nutritious foods. Through in-person events and the use of social media platforms, such as Facebook and Instagram, the programme invited young people to discuss these challenges and

to generate ideas on social change for healthy diets. In addition, it organised in-person events with parents and teachers to encourage their support of young people with ideas about social change and to create a supportive interpersonal environment.

Mentorship sessions: Receiving ideas and bringing them to life

The youth mentorship sessions sought to build

the necessary skills for young people to clearly articulate their ideas and bring them to life.

Young people aged 12-20 years were invited to submit ideas on social change for healthy diets to the programme's online platform. In total, 362 collective and individual submissions were received, 78 of which were complete applications that included a brief problem description, the proposed solution and the potential for impact and sustainability. The programme recruited eight young individuals (five females and three males) from Ashoka to conduct the mentorship sessions. The mentors conducted a first session with the selected participants to help them to refine problem statements and define the steps needed to translate their ideas into actions. Those who participated in school workshops received in-person mentorship while those reached via the social media campaign received online mentorship.

Based on the participants' engagement during the mentorship sessions and how complete the submitted idea was, the mentors selected the top 45 ideas to receive a second mentorship session. After the second session, the participants developed a one minute video presenting their refined ideas. These videos were rated by the programme's team based on creativity, potential for impact and sustainability. The masterminds behind the top 25 ideas participated in the 'Do it, Grow it' summit con-

Box 1 Description of Saya Pemberani's top three ideas

Idea #1 – "Food Investigator initiative" to improve food safety

Dina is a junior high school student in the small village of Desa Selodakon in Jember, East Java. Realising that many school canteens and markets in her village sold expired food, she and her team developed the "Food Investigator initiative" to raise awareness amongst students and vendors about the importance of food safety, to educate vendors on practices that would ensure food safety and to inspect retail stores and school canteens to check for the presence of expired food.

With support from school and local village officials, the team implemented the Food Investigator initiative in their neighbourhood. In collaboration with the school student councils, school principals and religious and local community leaders, the team plans to expand the implementation of the Food Investigator initiative to surrounding areas. They also plan to offer it as one of the extracurricular activities in schools and promote it through social media. In the long term, the team aims to influence local food and nutrition policies to strengthen the enabling environment to ensure the availability of safe foods.

Idea #2 – "Green garden" to increase the availability of fresh fruits and vegetables

Living in the diverse city of Surabaya, Andrew noticed that some children had short stature for their age and thin bodies. Linking these

problems to inadequate nutrition, Andrew was motivated to improve the availability of nutritious foods to help children grow and thrive. Andrew and his team, a group of friends motivated to improve nutrition, came up with the BUJO (or Green Garden) idea which invites neighbours to plant food crops or vegetables in a public garden or designated area while implementing the concept of 'Plant-Grow-Harvest-Use/Sell-Recycle'. BUJO's long-term goal is to institutionalise this initiative so that people around the country benefit from the increased availability of fruits and vegetables in their communities.

Idea #3 – "Sister Health": an app to map food vendors

When Rizal was a freshman, he and his friends experienced food poisoning after visiting food vendors around their university campus. Rizal discovered that most food vendors had low sanitation standards, exacerbated by limited access to clean water and poor waste management. With his team, he developed Sister Health, an android-based application with a map of food vendors around the campus who followed hygienic practices and sold nutritious food. The app contains various features such as tips and tricks for healthy eating and a star-rating system for students to assess the hygiene of food vendors. In the long term, the team plans to build a student movement to improve food hygiene and sanitation around the university premises.

ducted in Jakarta on 24 February 2020. During this event, the programme team mentored the participants on leadership strengthening, teamwork, collaboration and communication skills. After the ideas were presented to a select panel of judges consisting of youth innovators, communication experts and representatives from GAIN, Ashoka and government institutions with youth programmes including the Ministry of Health and the Ministry of Education, the top three ideas received further mentoring support to transform their ideas into well-grounded, fundable proposals (Box 1).

Saya Pemberani's participants proposed innovative ideas for social change. Most of these ideas focused on developing nutritious food and beverage products such as tempeh (traditional Javanese food made from fermented soybeans) ice cream, healthy burgers, vegetable snacks and fruit drinks. Other ideas involved creating community gardens, designing communication campaigns or mobile apps for nutrition education, igniting a social movement around eating locally-produced foods and advocating for free access to potable water in schools.

Programme assessment

Reconstra (a research focused organisation), with guidance from Ananda partners (a social entrepreneurship organisation), conducted an independent process evaluation between March and December 2020. The study aimed to assess Saya Pemberani's reach (to what extent the programme reached its intended audience), fidelity (to what extent the programme components were implemented as intended) and the participants' satisfaction (how the participants characterised their engagement with Saya Pemberani).

In-depth semi-structured interviews were conducted remotely with a purposive sample of 58 individuals involved in Saya Pemberani. The respondents included seven representatives of the organisations who led the programme design and implementation (two respondents from GAIN, three from Ashoka and two from Dentsu), eight mentors, four jurors, four teachers, nine parents (four out of the top 25 ideas, five out of the top 10 ideas) and 26 participants.

Results

Reach

Young people from different areas, age groups and schools participated in the programme (see Table 1). Through the school workshops, Saya Pemberani reached 1,166 students and teachers from 23 private and public schools. The social media campaign generated 10,535 clicks to the programme's website.

A total of 78 complete applications were submitted by teams of young people. The young people reached via school workshops submitted more ideas and produced more ideas that advanced to the following rounds. Students from the Santa Maria Junior and Senior High School in Surabaya submitted a high number of applications, 16 of which were shortlisted to the top 45 ideas and three of which made it to the top 10.

Table 1 Characteristics of Saya Pemberani's ideas

	Complete applications (n=78)		Top 45 ideas (n=45)		Top 10 ideas (n=10)	
	n	%	n	%	n	%
Reach (found out about the programme)						
School workshop	65	83%	40	89%	9	90%
Social media and WhatsApp	13	17%	5	11%	1	10%
Type of school						
Junior High (13-15 years of age)	23	29%	14	31%	3	30%
Senior High (16-18 years of age)	35	45%	21	47%	3	30%
University students (>18 years of age)	14	18%	6	13%	2	20%
Other (13-18 years of age)	6	8%	4	9%	2	20%
Sex						
Female lead	52	67%	30	67%	7	70%
Male lead	26	33%	15	33%	3	30%
Area						
Surabaya and surroundings	42	54%	25	56%	5	50%
Jember and surroundings	35	45%	19	42%	4	40%
Other areas	1	1%	1	2%	1	10%

Programme fidelity

The majority of Saya Pemberani's activities were implemented as planned although a few adjustments were made to accommodate the larger than expected number of submissions. For instance, the duration of the social media campaign was shortened from 95 to 52 days and participants were encouraged to collaborate and to merge similar ideas. Eight mentors were assigned to conduct the sessions, four in Surabaya and four in Jember. As planned, they each conducted three in-person and/or online mentoring sessions.

In-person mentoring sessions were organised in convenient settings for the participants including schools, libraries and coffee shops. The sessions were held as group discussions and aimed to facilitate meaningful interactions among the teams of youth participants. The number of participants during each session was larger than expected, especially during the first session. By the third session, each mentor managed between five and seven groups. Each mentoring session lasted for approximately 90-120 minutes. As complementary activities, online webinar sessions on media and communication, leadership skills and nutrition were led by experts in these areas. In addition, the mentors and participants engaged in frequent discussions via WhatsApp groups and calls.

Participants' satisfaction

According to the participants, the mentorship programme helped them to gain skills on leadership, teamwork, problem solving, critical and creative thinking and communication. The participants also reported becoming more aware and knowledgeable about the importance of, and challenges to, achieving healthy diets. Both the participants and mentors mentioned that engaging with Saya Pemberani improved their food choices and intake of nutritious foods.

By the end of the programme, most teams that participated in the three mentorship sessions were able to articulate well-grounded proposals for social change with a clear problem statement, rationale, theory of change and defined targets. However, both mentors and participants recommended extending the duration and intensity of the programme to further meet project goals. Teams who did not advance to the final rounds, but who were committed and motivated to bringing their ideas to life after the programme's completion, suggested that additional follow up activities and opportunities for engagement be made available. To promote the continuity of proposed actions, Saya Pemberani linked the participants to Ashoka's broader network of individuals with social entrepreneurship skills called the Kampung Pembaharu (village of changemakers).

Young people faced various challenges to participating in the mentorship sessions and refining their ideas including tight schedules, academic obligations and other competing priorities. Aware of these challenges, the mentors maintained flexibility in scheduling the in-person and remote discussions with the groups.

Lessons learned and recommendations

The combination of offline and online activities garnered attention and engaged a wide range of participants including very young adolescents, individuals living in peri-urban areas, with a greater number of girl participants. While social media was an effective channel to reach young individuals in the programme areas, the participants preferred in-person mentorship sessions as a means to advance their ideas and receive personalised advice. The participants valued engaging with mentors and peers during in-person activities which highlights the importance of creating social connections and promoting real-life interactions during this formative life stage.

Saya Pemberani purposively targeted those with access to technology without initially considering the digital inequity of its target population. The participants from Surabaya and wealthier families had better connectivity and access to electronic devices which helped them to engage closely with the mentors and access resources and tools to 'fine tune' their ideas. The programme adapted to account for these inequities, with both the mentors and judges considering the participants' access to resources when supporting and evaluating the teams' progress and ideas. Future initiatives should assess if there are disparities in digital access among their target population and devise strategies to mitigate their impact on diverse programme participation and engagement.

In addition to the digital inequity, the programme had to consider the age differences between the participants. Younger adolescents had trouble participating in group discussions that were generally dominated by older individuals. While programmes can segment their target population to include individuals of similar age groups, there is value in bringing people of different ages together, as they have different perspectives and can learn from each other (e.g., through mentorship sessions among age groups). Programmes can facilitate more inclusive and equitable participation by taking age-specific needs and capabilities into account and adopting recommended practices such as using jargon-free language, being mindful of the power dynamics in the groups and safeguarding the rights of younger participants to speak freely at any time (USAID, 2014).

Saya Pemberani's participants identified and articulated context-specific problems that interfere with or limit healthy eating. Refining barriers to safe and healthy eating into problem definitions was not a straightforward task as it required the capacity to understand complex ideas and to think abstractly. The participants benefited from Saya Pemberani's guidance on problem definition which helped them to gain a better understanding of the nutrition situation in their cultural context. They followed a step-by-step problem articulation process by conducting a detailed root-cause analysis. By framing the problem from their perspective and understanding, the participants were better equipped to craft relevant solutions specific to their local environment that resonated with their peers.

The successful pursuit of social entrepreneurship is dependent on the confluence of enabling factors and conditions. The Santa Maria Junior and Senior High School, which championed and supported Saya Pemberani, achieved a high number of applications; participants from this school mentioned teachers and parental support as key facilitators for programme engagement. The participants also reported that engaging with Ashoka's larger network of social entrepreneurs provided essential support, motivating them to continue working on their ideas and to produce high-quality proposals.

Conclusion and future direction

Saya Pemberani helped the participants to gain and reinforce leadership and transversal skills

such as complex problem solving, analytical skills and creativity which prepare them to navigate both current and future challenges. The programme helped to increase the participants' and mentors' knowledge and motivation for eating healthy diets. While the programme generated an influx of creative and innovative ideas, it also illuminated that young people need guidance and support to refine their proposals. A phase-out strategy involving informal guidance from mentors or peers can help to ensure that participants continue to receive support even after a programme reaches completion.

By adopting the social entrepreneurship approach, the programme sought to engage the participants as leaders (as opposed to partners or contributors) who were responsible for developing the proposals from ideation to target setting and planning for implementation. Saya Pemberani played a facilitator role by providing advice, creating links and opportunities to interact and exchange ideas and reinforcing the skills that enabled the participants to pursue their own goals. The Food Investigator proposal became the basis for a successfully funded project aimed at developing a gaming application to promote better food choices by adolescents, marking a major accomplishment of the entrepreneurship approach.

Adopting a social entrepreneurship approach can help to build relevant programmes for young people. Future initiatives should devise strategies to implement more diverse programme participation. Partnering with organisations that have well-established relationships with their communities can help to engage young people from disadvantaged groups such as low-income populations and out-of-school individuals. Developing strategies that engage parents, teachers and community leaders will better ensure the continuation of mentorship and support beyond the longevity of the programme and the sustainable engagement of young people in the design and implementation of activities related to healthy diets relevant to younger populations.

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Adolescents learn about nutrition in Indonesia

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Adolescents from a government school in Haryana, India, getting a weekly iron folic acid tablet



© UNICEF/India/Diwakar Mishra

Weekly iron and folic acid supplementation and nutrition education for adolescent girls in Africa and Asia

ASIA & AFRICA

What this article is about: This article outlines the activities carried out by Nutrition International since 2015, providing weekly iron and folic acid (IFA) supplementation to adolescents residing in six separate high-risk countries.

Key messages:

- Despite regional supply chain challenges and the complications due to the COVID-19 pandemic, weekly programmes were successful in supporting governments to increase IFA supplementation coverage.
- There remains a paucity of data on adolescent health outcomes which makes the design, implementation and monitoring of adolescent health projects particularly difficult.
- Although school-based delivery models are effective at the population level, reaching adolescents who do not attend school – who are often at higher risk – remains a significant challenge. Governments should prioritise reaching these isolated groups in order to meet public health policy objectives.

Background

Iron deficiency anaemia is the number one cause of lost disability-adjusted life years in adolescent girls and is estimated as the largest cause of morbidity and mortality for this group globally (WHO, 2017). Over 30% of adolescent girls in low-and-middle-income countries (LMICs) have anaemia which is associated with reduced cognitive development, academic and productive potential, decreased wellbeing and increased morbidity and mortality (WHO, 2011).

The World Health Organization (WHO) recommends weekly iron and folic acid (IFA) supplementation (WIFAS) to reduce anaemia in adolescent girls 10-19 years of age and women 15-49 years of age in regions where more than 20% of women of reproductive age (15-49 years) are anaemic (WHO, 2011).

Since 2015, Nutrition International (NI) has built upon previous work in Chhattisgarh, India and begun to work with national and subnational governments in six African and Asian countries to implement adolescent nutrition programmes under the 'Right Start' in-

itiative (2015-2020) which includes WIFAS and nutrition education to reduce anaemia. While all programmes are based on WHO recommendations, each one is tailored to fit national nutrition and anaemia reduction strategies so no two are identical. This article shares diverse learning experiences from programme implementation over the past several years.

Programme description

NI consulted with the government in each country to prioritise programme areas in six Asian and African countries where the prevalence of anaemia was high among women of reproductive age, i.e., India, Indonesia, Kenya, Senegal, Ethiopia and Tanzania (Table 1).

In each country, NI consulted with the government to develop optimal strategies for the implementation of WIFAS and nutrition education programmes. This was done in accordance with WHO guidelines and through adapting dosage recommendations to take into consideration access to and availability of supplies. NI provided technical assistance and operational support to the government health and education departments, securing

Table 1 Anaemia rates among pregnant women and women of reproductive age (15–49 years) in NI-supported countries

Anaemia rates among age group	Ethiopia	Kenya	Senegal	Tanzania	India	Indonesia
Pregnant women	29%	41.6%	61% ^a	-	50.4 % ^a	48.9% ^a
Women of reproductive age (15–49 years)	24%	21.9%	54.1% ^b	28.8%	53.2 % ^a	26% ^b
Source	Ethiopia Demographic and Health Survey (EDHS), 2016	Kenya National Micronutrient Survey (KNMS [#]), 2011	a. Demographic and Health Survey –Multiple Indicator Cluster Survey (DHS-MICS 2010-11 ⁱⁱⁱ) b. Senegal Demographic and Health Survey DHS ^{iv} , 2017	Tanzania National Nutrition Survey NNS ^v , 2018	National Family Health Survey (NFHS 4 ^{vi}) 2015-16	a. RISKESDAS: The National Institute of Health Research and Development, Ministry of Health, Republic of Indonesia (2018) b. RISKESDAS (2013)
ⁱ	https://dhsprogram.com/pubs/pdf/FR328/FR328.pdf		^{iv} https://dhsprogram.com/publications/publication-fr345-dhs-final-reports.cfm			
ⁱⁱ	http://www.nutritionhealth.or.ke/wp-content/uploads/Downloads/The Kenya National Micronutrient Survey 2011.pdf		^v https://www.unicef.org/tanzania/media/2141/file/Tanzania National Nutrition Survey 2018.pdf			
ⁱⁱⁱ	https://dhsprogram.com/publications/publication-fr258-dhs-final-reports.cfm		^{vi} http://rchiips.org/nfhs/pdf/NFHS4/India.pdf			

multi-sector government commitment towards the WIFAS project.

The operational models differed between countries according to specific contexts and geographic coverage. NI collaborated with the government and non-governmental organisations to deliver adolescent nutrition programming as summarised in Table 2.

When NI expanded its earlier adolescent nutrition work from Chattisgarh in India to additional states in India and five additional countries across Asia and Africa in 2015, WIFAS programmes were either not in place or were in nascent stages. In some countries, adolescent nutrition was prioritised in national policies but relevant operational guidelines, health management information system (HMIS), supply chains and implementation channels had not been set up and finances were not allocated for programmes.

In the initial years of programming, demonstration projects were implemented to garner support for multi-sector engagement, highlight best practices and generate data on the feasibility and cost-efficiency of platforms and partnerships for reaching adolescents. Collaborative efforts were made between partners to identify effective delivery channels and platforms for both WIFAS and nutrition education for girls in- and out-of-school. Support from NI included developing supplementation guidelines and costed subnational implementation plans, procuring IFA tablets from local manufacturers, facilitating training, conducting supervision and setting up monitoring systems. The initial focus was on the design and implementation of the WIFAS component, complemented by nutrition education related to anaemia and WIFAS. Later, a broader gender-responsive approach was implemented in most countries.

Delivery platforms and partnerships

For adolescent health and nutrition interventions, in-school platforms are both labour- and cost-efficient as they allow access to the largest groups of adolescents (Bundy, 2011). Schools are also connected to the health system, often through frontline workers from local health facilities fa-

cilitating referrals. Thus, in most countries, government-funded schools were the preferred primary delivery platforms.

However, in some countries, access to education is not universal¹ so the poorest and most isolated girls may be excluded if programmes are exclusively implemented in schools. In India, WIFAS programmes reached out-of-school adolescent girls through community-based outreach centres as per national policy. In the early phases, Kenya and Ethiopia tested approaches for reaching girls in the community through the health system; however, adolescents were not commonly accessing the health system for preventative nutrition and health services. Ethiopia is now reaching out-of-school girls via community platforms that use ‘motivator’ girls who are trained to provide information on nutrition and anaemia to their peers who are not attending school, encouraging them to attend the health facility for supplementation. This model is not yet at scale but there are plans to expand to high burden areas.

IFA supplies

The provision of IFA tablets through robust supply chains is a key element within adolescent nutrition programmes. Adolescent girls require WIFAS using

a distinct formulation of folic acid as per the WHO guideline. Although IFA tablets for weekly supplementation became available in the UNICEF supply catalogue in late 2019, this formulation is still not part of the WHO Essential Medicine List (EML), meaning that governments are constrained from purchasing them (Roche et al, 2021). NI therefore supports the supply chain for the respective government-endorsed product which is currently the formulation used for pregnant women.

NI has provided financial, technical and operational support to governments to strengthen the supply of commodities through improving health staff’s forecasting, procurement and supply capacity, strengthening supply chain management systems and providing training for teachers, health staff and other district officials. NI supported efforts to harmonise joint forecasting and procurement to ensure supply for both maternal and adolescent nutrition programmes.

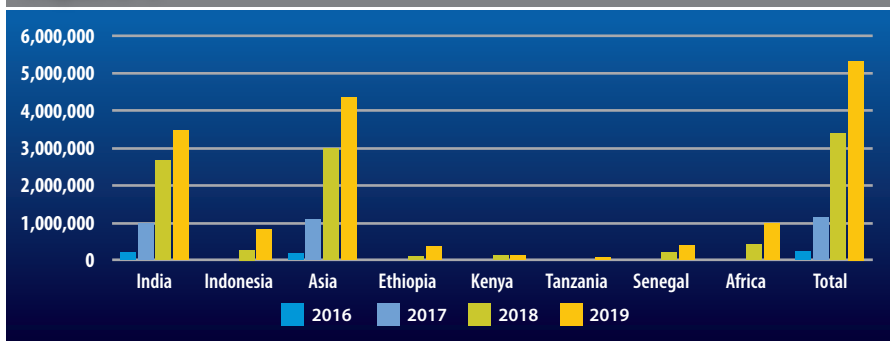
Nutrition education

Adolescent nutrition programmes have included robust evidence-based behaviour change interventions (BCI) that were developed following rigorous formative research with adolescent girls and boys, parents, health staff, teachers, commu-

Table 2 Programme operational arrangements according to country

Country	Programme governance	Programme implementation
India	NI in close collaboration with the Ministries of Health and Family Welfare and Women and Child Development	Local non-governmental organisations: Gorakhpur Environmental Action Group, Child in Need Institute and TRIOS Programme areas: Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh and West Bengal
Indonesia	NI in close collaboration with the Ministry of Education and Culture, Ministry of Health (MoH), the Ministry of Religious Affairs and the Ministry of Home Affairs	Direct implementation model with all field-level programme personnel directly engaged by NI. Programme areas: West Java, Banten, East Nusa Tenggara and East Java
Kenya	NI in close collaboration with MoH and the Ministry of Education (MoE)	Population Services International (pilot phase); County government programme managers in five counties (Busia, Nakuru, Nandi, Vihiga and Makueni) (scale-up)
Senegal	NI in close collaboration with MoH and MoE	Cellule de Lutte contre la Malnutrition (CLM) at national level and in Dakar, Thies, St Louis, Kaolack, Ziguinchor, Kolda and Sedhiou regions
Ethiopia	NI in close collaboration with MoH and MoE	MoH and MoE at national level and in Amhara, Oromia, Sidama and SNNP regions
Tanzania	NI in close collaboration with MoH and MoE	Amref Health Africa (pilot phase), and regional governments and TFNC (scale-up)

¹ According to UNESCO data, 62 million adolescents of lower secondary school age (10–14 years) and 138 million adolescents of upper secondary age (15–17 years) are out-of-school.

Figure 1 Additional³ adolescent girls who consumed the recommended weekly IFA supplements by country from 2016 to 2019⁴

nity influencers and religious leaders. The BCI strategy was critical to obtaining acceptance from the adolescent girls and their families with a focus on the benefits of WIFAS and anaemia reduction for school performance and the wellbeing of adolescent girls rather than on maternal and infant health outcomes.

Gender mainstreaming

NI recognises that it is essential to work through a gender-responsive approach to successfully engage women, girls, men and boys in adolescent programmes that strive to promote gender equality and overcome the inequities faced by adolescent girls. Anaemia disproportionately impacts adolescent girls, thus girls were prioritised for WIFAS but both adolescent girls and boys were reached with nutrition education. Men's buy-in to the programme was crucial to reaching adolescent girls and achieving scale-up, for example in cases where fathers or brothers are unwilling to enrol adolescent girls into interventions, success will not be possible. Gender barriers leading to reduced access to school for adolescent girls were identified in all settings and included menstrual hygiene management, early marriage and adolescent pregnancy, poverty and stigma.

WIFAS and nutrition education service providers

The training and capacity-building of service providers from health and education departments was undertaken at scale through formal and on-the-job training. This aimed to build knowledge of adolescent nutrition and strengthen capacity on operational issues such as procurement planning. Programme managers from the MoH, MoE and the Ministry of Agriculture were selected and trained to be trainers. They then cascaded the trainings to other subnational frontline health workers, community health volunteers, teachers and peer educators.

In most contexts, teachers were responsible for managing all aspects of the programme within the schools, i.e., conducting nutrition education, ensuring effective supplementation², managing IFA supplies and reporting on activities. Peer educators were also trained to support supplementation and, at times, to help teachers during the nutrition education sessions. Health workers collaborated with teachers, ensuring IFA supplies reached schools and connecting schools and health facilities. Since all WIFAS programmes were government-led, all duties carried out by teachers and health workers were incorporated into their work tasks by default in government schools.

Generating evidence and measuring progress

When possible, coverage of weekly IFA supplementation programmes was reported through the governments' HMIS. When HMIS did not include IFA supplementation indicators, for example in most African countries, parallel systems using paper-based forms were used. Data was recorded by teachers and consolidated by NI programme managers.

NI also conducted quantitative and qualitative surveys to measure the progress of country-level programmes and identify areas of improvement. Baseline assessments were conducted at the start of each programme with midline surveys conducted after two to three years of implementation and endline surveys conducted in year five. Within NI's global Nutrition Intervention Monitoring System, a set of uniform survey tools and data collection methodologies that were easily adaptable to different national contexts was developed. Surveys using these modules have been implemented in all countries since 2017 with the exception of India where there was already a reliable HMIS system for programme monitoring.

Programme adaptations to the COVID-19 pandemic

After school closures disrupted the WIFAS programmes, alternative models of programming emerged in different countries and NI advocated for and supported the delivery of WIFAS through community outreach wherever possible. Adaptations included providing additional IFA tablets to cover the period of school closures, delivering IFA tablets to homes, sending IFA tablets with remote school curriculum packages, using new channels of communication or adapting digital platforms to continue counselling, nutrition education, data collection and monitoring of IFA supplies.

Results/outcomes

Over the years of programme implementation, an increasing number of adolescent girls have been reached with WIFAS and nutrition education across the six programme countries with more success seen in countries in Asia rather than Africa (Figure 1).

In total, through the scale-up of the programme, an estimated 1.2 million cases of anaemia have been averted.⁵ NI's programme evaluation survey results clearly show increases in receipt and adherence to WIFAS over time, indicating the successful implementation of the programmes and BCI strategies.

Nearly 3.7 million adolescents, including almost one million boys, were reached with nutrition education over two years which includes the increased use of social media to reach this group such as in Senegal (Box 1).

In addition, more than 195,000 frontline workers were trained to deliver and support the implementation of the adolescent nutrition programme.

Successes, challenges and lessons learned

WIFAS programmes were successful in progressively supporting governments to create enabling environments and to develop capacity for delivering adolescent nutrition programmes which resulted in substantial increases in IFA supplementation and nutrition education coverage.

Lack of adolescent specific data

National HMIS do not capture certain indicators related to adolescents in many countries. In population surveys, older adolescents' data is combined with women of reproductive age (15–49 years of age) and data for younger adolescents, even for important indicators such as anaemia, illness and disease, is not captured at all. This paucity of data poses a significant challenge in programme development. NI addressed this by conducting formative research at the beginning of each programme to understand the aspects specific to adolescent nutrition in each context. These were integral to designing the programme, particularly the BCI strategy.

Considerations around IFA supplies

Shortages in IFA tablets are common in many LMICs where nutrition programmes are not prioritised. Regular stockouts, as well as the irregular and inequitable distribution of IFA supplements, pose immense challenges. To remedy this, NI identified supply chain management as a priority activity and provided the necessary technical assistance and operational support. This resulted in governments taking increasing responsibility for procuring IFA supplements during the scale-up period even if NI still provided financial support to cover the cost of the supplements.

The WHO-recommended formulation of weekly IFA supplements for adolescent girls is 60 mg iron and 2.8 mg folic acid. As this specific formulation was not available for purchase when NI began programming, maternal daily IFA supplements, which provide 60 mg iron and 0.4 mg folic acid, were used. To address this issue, NI collaborated with UNICEF to conduct market scoping to develop

² Directly Observed Therapy is a method of medicine administration where the health care provider (in this case the teacher) watches a person take their medication.

³ This means the additional girls that were reached due to NI's support for the programme. In India an additional 7.4 million girls were reached across 5 states, in WIFAS programmes that reached a total of 19.6 million girls. With the exception of India, in all other countries the baseline was zero when the new adolescent nutrition programmes were initiated with support from NI in 2015.

⁴ Source of data: Additional adolescent girls who consumed the recommended scheme of WIFA (12 tablets in last six months) as reported on governments' HMIS portals. In case HMIS data is not available for any particular year, annual sample surveys were undertaken to estimate additional coverage.

⁵ Calculated as per impact-based modelling through the Outcome Modelling for Nutrition Impact tool (<https://www.nutritionintl.org/learning-resource/omni/>)

Box 1 Use of social media for increased nutrition messaging in Senegal

During the COVID-19 pandemic, the use of digital communication led to an increase in adolescents reached with nutrition messaging in Senegal where the project's Facebook page reached 7,682 subscribers. Messages on sexual and reproductive health and nutrition reached 44,269 people and generated thousands of interactions (likes, comments etc.). More than 71% of the people reached were male. Adolescents and youth (13 to 24 years of age) represent approximately 65% of the readers and users of the Facebook page. Young adults (25–34 years of age) and adults (over 34 years of age) represent 22% and 13% of the page's readers and followers, respectively.

an appropriate product. This included conducting a user preference survey with adolescent girls from six countries in 2017. As previously mentioned, the adolescent-specific IFA formulation became available in late 2019 but is not yet available in any of the NI programme countries due to the cost and absence from the WHO EML.

COVID-19 related challenges and successes

Adolescent nutrition programming consistently evolved during the COVID-19 pandemic where innovative approaches successfully supported the continuation of programming. Digital technology and virtual platforms emerged as the most reliable medium for nutrition education.

Through programme adaptations, coverage of WIFAS increased after an initial drop, with more girls being reached via community platforms. This was made possible by collaboration with local champions such as village midwives, teachers, health workers and youth groups.

Enhancing adolescent participation

NI's programmes have ensured that adolescents led the key activities and provided crucial support to ensure the continuation of the programmes. Examples of adolescents' engagement include acting as 'motivator' girls in Ethiopia, designing BCI campaign slogans in Kenya and participating in a content creation workshop as adolescent champions in Indonesia. These activities have contributed to programme acceptance.

Reaching out-of-school girls

Coverage among out-of-school adolescent girls remains low. This group is harder to reach as they are geographically scattered, often marginalised from the health system and likely to be in resource-poor settings yet they experience a higher risk of malnutrition. National governments need to make additional targeted investments to reach out-of-school adolescent girls with WIFAS and nutrition education. Lessons learned from India's experience in reaching both in- and out-of-school-adolescent-girls in five states are important and show that des-

ignating pre-existing, functional platforms at the community level for adolescent health and nutrition interventions could be effective in other countries.

Leading advancements in adolescent nutrition programming and training

Globally, efforts were made to advance the state of knowledge and good practice in policy and programme delivery for adolescent nutrition and specifically for WIFAS. NI's efforts contributed to IFA supplements becoming available in their recommended dosages for weekly supplementation. NI worked with academic research partners to understand the efficacy of WIFAS for optimising blood and plasma folate levels for neural tube defect prevention (Samson, 2020). This addressed a critical gap to having weekly IFA supplements eligible for consideration for the EML for anaemia or neural tube defects (Roche, 2021).

NI is currently leading the development of key technical resources to support capacity building for programme staff, partners and interested stakeholders. The Adolescent Nutrition and Anaemia Online Course⁶ with 15 modules was developed and launched by NI to overcome gaps in the availability of global adolescent nutrition training. Other resources include Frequently Asked Questions (FAQs) for WIFAS,⁷ case studies from different countries and tools to support the gender mainstreaming process.

Conclusion

NI's experiences demonstrate the successful establishment and scale-up of WIFAS across several countries in Asia and Africa with the prioritisation of supply chain management, the enhanced engagement of adolescents themselves and the adaptations to reach girls out-of-school being key attributes. The programmes have also focused on highlighting the gender inequities in girls' access to school, including menstrual hygiene management, early marriage, adolescent pregnancy, poverty and stigma. Since 2019, as adolescent nutrition programmes have matured, greater focus is being given to nutrition education for both adolescent girls and boys.

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A girl eats a healthy snack at school in Mexico



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‘Vida Saludable’: Healthy living is on the school curriculum in Mexico

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MEXICO

What this article is about: This article outlines the development of a new subject – ‘Vida Saludable’ or ‘Healthy Living’ – which is featured in the Mexican national school curriculum. The subject aims to educate schoolchildren whilst tackling the wider nutritional challenges facing Mexico’s youth.

Key messages:

- Vida Saludable is the latest in a growing body of nutrition-focused initiatives that the Mexican government has introduced in recent years with the objective of curbing the national obesity epidemic in the context of the COVID-19 pandemic.
- This comprehensive initiative highlights the value of collaboration between government departments and organisations with the formation of the new subject showcasing the government’s ability to develop a novel, evidence-based, child and adolescent-focused intervention.
- Despite successes, remaining challenges revolve around implementing a robust monitoring and evaluation system, as well as formally incorporating the subject into the national curriculum and resolving the associated timetabling issues.

Background

Since the turn of the century, Mexico has made steady progress across a number of nutrition indicators (Global Nutrition Report, 2021). Child and adolescent (5-19 years) underweight prevalence, now at 8.8% and 9.7% for girls and boys respectively, has decreased year on year, exclusive breastfeeding in children under six months increased from 14.4% in 2012 to 28.6% in 2018 and the dietary intake of adults older than 25 years of fruits, legumes, whole-grains, fibre and polyunsaturated fat all fall above the global average with sodium consumption falling below. For more than a decade, the government has also proactively pursued favourable public health nutrition policies such as salt iodisation, sodium reduction, sugar-sweetened beverage taxation, introducing food warning labels and restricting the marketing of ultra-processed foods towards children. The country therefore appears to be ‘on course’ towards meeting global nutrition targets.

However, progress in Mexico is a tale of two sides. As the burden of undernutrition has fallen, overnutrition has risen. In 2020, the combined prevalence of overweight and obesity amongst the school-aged population (5-11 years) was 38.2% with the prevalence rising to 43.8% in adolescents and up to 44.6% in adolescent women specifically (Shamah-Levy et al, 2021). Vegetables, nuts and seeds and omega-3 consumption are all under the global average, with red and processed meat and sugar-sweetened beverage consumption higher compared to the global average (Global Nutrition Report, 2021). Moreover, the emergence of the COVID-19 pandemic has reaffirmed overweight and obesity as a public health priority in Mexico due to the links with increased susceptibility to COVID-19 (UNICEF, 2021).

In response to the nutritional challenges facing Mexico’s youth, the Ministry of Health (MoH) and the Ministry of Education (MoE), with the support of UNICEF, launched a new subject for the school curriculum, ‘Vida Saludable’ (healthy living) (Government of Mexico, 2020). The project aims to help children to develop healthy habits through long-term behaviour change. The original idea for Vida Saludable was driven by the government of Mexico with President Andres Manuel Lopez Obrador introducing the idea to provide a unified response to the public health problems faced by the country’s youth. This vision was in place before the COVID-19 pandemic but the arrival of the virus in Mexico, along with the evidence that obesity and diabetes influenced intensive care admittance rates (Cai et al, 2020), reinforced the need for the programme. This paved the way for the MoH, MoE and UNICEF to unite and deliver the initiative. The design of the programme was finalised in June 2020 and the programme was rolled out from July, although it remains unpublished to date.

The Vida Saludable initiative Background research and development

Although nutrition partially featured on the existing national curriculum in the form of civic studies, science and physical education, the Vida Saludable vision is to formally incorporate nutrition, physical education and hygiene into the learning roster to combat the emergence of obesity, diabetes and sedentary lifestyle behaviours. Like many other public health endeavours of such magnitude, Vida Saludable was informed by other current public health projects. Approaches such as the labelling of ultra-processed foods, sugar-sweetened beverage taxation

and increased access to water fountains in schools – all part of a collective effort to dissuade the youth from consuming sugar-laden, fizzy drinks – attempt to facilitate healthier lifestyle behaviours in children and adolescents. Each of these initiatives is linked to the Mexican government's wider policy objective of combating obesity with the Vida Saludable initiative designed to build upon these policies, specifically targeting the youth population who are particularly susceptible to the obesogenic environment.

Although the project has its origins in Mexico, evidence was taken from a number of global sources with the UNESCO and World Health Organization's (WHO) Global Standards for Health Promoting Schools (WHO, 2018) informing best practice and the UNICEF transferable skills framework (UNICEF, 2019) used to build the intervention. Before Vida Saludable, there was a precursor programme, 'Scholar Health', which was run by various government entities related to health, education and social protection and in collaboration with the National Institute of Public Health, UNICEF and the Pan American Health Organisation (PAHO). Vida Saludable therefore relied on the work of this same consolidated group of individual entities who, after the arrival of the COVID-19 pandemic, were commissioned to carry out a one-month review to appraise empirical evidence pertinent to the Vida Saludable initiative. The review was initially carried out by the health sector before being transferred to the MoE who applied expertise from the education system. Over 200 international documents and reports were reviewed to guide the initiative, with the formation of the programme representing a collective effort featuring a large workforce of professionals operating in various roles across the aforementioned institutions.

Vida Saludable diploma

To ensure quality across schools, the General Directorate of Continuous Training for Teachers and Managers, housed within the MoE, introduced a Vida Saludable Diploma for teachers. The creation of a formal diploma encouraged teachers to complete this training before delivering the subject to students although the course was not compulsory. Various materials were developed for teachers which were divided into five modules: 1) comprehensive human development and health care, 2) mental health, 3) healthy and sustainable food, 4) physical activity and sleep habits and 5) personal hygiene and cleanliness of environments. Teachers could complete the diploma independently by downloading a study guide and an activity booklet for each module as well as a general introductory guide. UNICEF contributed to the development of the healthy and sustainable eating resources, based on the study guide developed by the National Institute of Public Health (INSP), with an approach focused on optimal communication for behaviour change.

Implementation and the COVID-19 pandemic

Vida Saludable learning began in July 2020 with the 'learn at home' platform aimed at preschool

through to high school students across the country via television, radio and the internet. The intervention was shared in a novel format through interactive games. However, once the government acknowledged that the pandemic was likely to be protracted, this platform became the long-term strategy for delivering the initiative in the 2020-2021 school year.

To build upon remote education, food diaries were provided to the students with each participant expected to reflect on their food and drink consumption which was then followed up by teachers. This made the students aware of any entrenched suboptimal dietary habits such as excess salt or added sugar consumption. The primary goal of this multi-platform approach was to reinforce healthy habits, allowing students to become more autonomous in their lifestyle behaviours, irrespective of the wider obesogenic environment they found themselves in.

Funding

Funding efforts for Vida Saludable were initially coordinated by the Secretary of Education. As much of the programme was, and still is, delivered via television, radio and the internet, Mexican state television helped to finance the programme. Alongside state resources, other partners, including the Danish toy manufacturer LEGO®, were brought on board to help to fund delivery.

Results

The Vida Saludable initiative has now been fully implemented into the national curriculum in all 32 states in Mexico, targeting children aged 6-15 years, despite the initiative not yet being officially enshrined in national policy. Testimonies from the participants involved so far speaks to the popularity of the initiative amongst children.

However, no quantifiable results are available for the programme as yet. Changes in federal

administration, specifically within the MoE, and subsequent changes in the education system have made it difficult to determine to date how to quantify success and how success will be measured moving forwards. UNICEF and INSP are currently aiming to support government efforts by conducting a study to analyse the design, implementation and specific outcomes of the initiative through a non-representative sample from three states, to inform future improvements to the initiative. In the middle of the 2021-2022 school year, the short-term results of the implementation of this initiative will be analysed through quantitative and qualitative methods, including interviews with teachers and focus groups with students.

Lessons learned and next steps

The Vida Saludable initiative is an example of how large-scale, seemingly insurmountable challenges such as the national obesity epidemic can be broken down into smaller objectives and tackled using a combination of unified and targeted interventions. Previous nutrition-focused policies have had mixed success in Mexico although progress has been made on some nutrition indicators over recent years. However, collectively, such policies have laid the foundations for Vida Saludable to be successful and this example highlights how a proactive government approach to a public health crisis has the potential for impact. The introduction of Vida Saludable to the national curriculum would have been a greater challenge had previous iterations of the scheme, such as 'Scholar Health', not been in place. Such leadership from the government must be commended.

One of the success stories of Vida Saludable is the coordination of different inter- and intra-governmental actors during the development phase. Firstly, the unified approach from the MoE and MoH highlights a level of coordination that, up until now, has not always been apparent



Children eat a variety of healthy snacks at school in Mexico

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at this level of government in Mexico. On a practical level, the consolidation of over 200 international documents and reports to guide the initiative, along with the coordination of the large workforce required to do this, shows promise for the future of Vida Saludable and subsequent programmes that the government prioritises to implement. This process also highlights the government's commitment to evidence-based programming as well as a willingness to recruit external agencies, namely UNICEF, to provide technical expertise in the interest of delivering a successful intervention.

A paucity of data demonstrating progress, success and impact represents the biggest challenge of the Vida Saludable initiative so far. This is especially pertinent given the scale of the project, with national rollout susceptible to diminishing returns as some regions may perform worse than others, highlighting the need for detailed subnational data. The construction and subsequent implementation of a monitoring system designed by the government, based on the findings from the UNICEF and INSP study, is a necessary addition to the programme that will provide both short- and medium-term results. The provision of this evaluation can therefore offer a valuable opportunity to incorporate lessons learned moving forwards.

The lack of usable data has been mostly attributed to challenges at the policy level. Changes in personnel within the government have hindered the implementation of a workable monitoring and evaluation strategy. These same changes have also made it difficult for Vida Saludable to be integrated into national policy as, long term, there is uncertainty regarding the most effective way to fit the subject into the national curriculum. The impact on timetabling and the knock-on effect that introduction would have on other subjects are key questions for the initiative moving forwards.

In addition to these broader challenges, changing the ingrained habits found within the Mexican lifestyle has been problematic for the programme so far. For example, questions have arisen about how best to reach wider family members within the household. This is the main driver of a move away from ultra-processed foods toward the purchase of food from local markets which in turn is an important aim for Vida Saludable. For this reason, the social determinants of health are being included in lessons so that children can critically engage with the subject matter and work with their parents to overcome the obstacles of behaviour change.

However, linked to the wider determinants of health, there is an acknowledgement that this programme may only go so far in delivering change. For example, promoting behaviour change models in isolation is unlikely to confer significant gains for families who live in conditions not conducive to healthy living. The hygiene arm of Vida Saludable will not change the lives of those who have limited access to appropriate water, sanitation and hygiene facilities, for example. Nutrition education can increase agency and improve dietary decision-making but it will not be able to overcome the proliferation of ultra-processed foods, sugar-sweetened beverages and a lack of access to fresh produce that constitutes the food environment found in some districts.

Therefore, a multi-sector approach to address income generation, poverty alleviation, sub-optimal food systems and making healthy choices accessible to young people is required to create an enabling environment, ensuring the long-term success of Vida Saludable. Nevertheless, the introduction of Vida Saludable holds promise, as wider policies are already in place which point to the government's willingness to implement a multi-sector approach. Since 2010, and then updated in 2014, guidelines

have been published that prohibit the sale and distribution of foods that do not meet specific nutritional criteria between Mondays and Thursdays. There is also a law that mandates the installation of drinking fountains in all schools although this ambition is yet to be fully realised. With the return of pupils to classes after the initial impact of the COVID-19 pandemic, the dialogue between the MoE and MoH is being resumed to push forward with these regulations to facilitate healthier school environments.

Conclusion

Vida Saludable is the most recent in a growing body of nutrition-focused initiatives that the Mexican government has introduced in recent years. Obesity amongst children and adolescents is a public health priority and the government has responded proportionately with this curriculum-based initiative which it hopes can stem the tide of unhealthy lifestyle habits that have crept into daily life. However, although promising steps have been taken, a paucity of data prevents any conclusive evaluation of the programme so far. The next steps for Vida Saludable will be to officially incorporate the subject into the national curriculum which will give the initiative more visibility as well as contribute to the broader strategy of healthier living in Mexico. Above all, implementing an effective monitoring and evaluation strategy, with the support of UNICEF and INSP, is integral to documenting the success of the initiative and determining whether Vida Saludable is a worthwhile endeavour.

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Furthermore, to see an example of Vida Saludable in action, please visit the following link: https://www.youtube.com/watch?v=Lx43eT4Kh_4

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School children at Hebron in an all school breakfast event at Al-Yarmouk Primary girls school, Hebron, West Bank

Improving the nutritional well-being of school-age children through the Nutrition-Friendly Schools Initiative (NFSI) in the State of Palestine

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This Field Exchange report is a summary of the cumulative results that were attained through Nutrition-Friendly Schools Initiative interventions implemented between December 2018 and June 2021 in the State of Palestine. The authors wish to acknowledge the generous financial support from the Government of Norway and UNICEF Global Nutrition Thematic Fund for this work. Thanks are also extended to all implementing partners, particularly during the difficult period of implementation resulting from the COVID-19 pandemic.

GAZA & WEST BANK

What this article is about: This article outlines the Nutrition-Friendly Schools Initiative, a UNICEF-Supported intervention targeting healthy dietary and physical activity habits and improved nutritional status of school-age children.

Key messages:

- Contextualizing innovative Nutrition Friendly School approaches and tailoring interventions towards the COVID-19 response achieved high coverage of school-age Palestinian children, building the foundations for future interventions.
- Initially, the absence of a National Nutrition Adolescent protocol, including clear procedures on school-age children nutrition screening and treatment, posed a significant challenge to the early stages of implementation. However, the introduction of revised National Nutrition Protocols mitigated this challenge, highlighting the value of adolescent-specific public health and nutrition policies.

Background

Approximately 4.8 million Palestinians live in the State of Palestine (SoP), with an estimated 2.9 million people living in the West Bank and 1.9 million in the Gaza Strip. The Palestinian population is predominantly young, with 48% under 15 years of age and 30% between 15-29 years of age (PCBS, 2017). Palestine is affected by a protracted humanitarian crisis related to the ongoing and chronic Israel-Palestine conflict, internal political divisions, and a deepening socio-economic crisis. As a result, Palestinian children and adolescents face vulnerability to violence and hardship with limited access to essential services including health, nutrition, education, social and safe water and sanitation services. The most recent household poverty survey (PCBS, 2017) found that 29.2% of Palestine's population live in

poverty (14% in the West Bank and 53% in the Gaza Strip) and 16.8% live in what is classified as 'deep' poverty¹ (5.8% West Bank, 33.8% Gaza Strip). Extremely high levels of food insecurity persist (47% in the Gaza strip compared to 16% in West Bank (PCBS, 2017)) and latest estimates (December 2020) suggest that 2.2 million people (including 1.1 million children) are in need of humanitarian aid (UNICEF 2021).

The situation is more acute in Gaza given the recurrent hostilities, the long-standing restrictions on movement and access to goods

¹ National monetary standards for poverty in Palestine, as set by PCBS in 2011, are defined as a poverty line of 2,293 NIS (\$637) per month for a family of two adults and three children. 'Deep poverty' is classified as a monthly income of NIS 1,832 (US \$509) or less per month for basic items such as food, clothing, and housing.

which, along with an ongoing electricity crisis, have exacerbated pre-existing vulnerabilities. This has led to unprecedented levels of unemployment, poverty and high rates of food insecurity, all of which have been compounded by the COVID-19 pandemic. The Palestinian Micro-nutrient Survey (conducted in 2013) indicated a high prevalence of anaemia among children, adolescents, and pregnant women; with a noticeably higher prevalence in the Gaza Strip (31% in adolescents) compared to the West Bank (22% in adolescents). Anaemia prevalence rates were 10.5% in adolescent boys but almost one in every five girls was classified as having anaemia. Furthermore, the Ministry of Education's surveillance found that Palestine faces a double burden of malnutrition in adolescents with rising rates of overweight, particularly among teenage girls (16.6%) and accompanying diet-related non-communicable diseases (NCDs). As of 2018, the indicators related to adolescent nutrition had not improved, despite the implementation of a variety of health and nutrition activities. This highlighted the urgent need for community-based adolescent-focused nutrition interventions.

Given this, from 2018 the Nutrition-Friendly Schools Initiative (NFSI) was implemented with support from UNICEF aiming to assist the government's efforts in a school-based multi-sector approach to address malnutrition among adolescent girls from the most vulnerable districts of the West Bank and the Gaza Strip. The NFSI approach included policy dialogue and advocacy with Palestinian authorities to change the education policy to promote adequate adolescent nutrition as well as a component focused on modelling and scaling-up effective interventions within schools and communities, including supporting capacity building activities for teachers, caregivers, children and community representatives, community mobilisation initiatives and the provision of supplies such as micronutrient supplements.

The NFSI Programme

The NFSI programme aimed to support the Ministry of Education (MoE) and the Ministry

of Health (MoH) to establish healthy dietary and physical activity habits and improve the nutritional status of school-age children. The programme aimed to strengthen the involvement of parents, families, and communities, complementing formal ongoing school interventions, and creating an enabling environment for sustainable positive change around nutrition and healthy lifestyles through the evidence-based Nutrition Friendly Schools (NFS) model (WHO, 2021). As a package of interventions to promote healthy dietary habits, the NFSI framework outlines 26 essential criteria within five broad components: school nutrition policies, school community awareness and capacity building, nutrition and health-promoting curricula, supportive school environments for healthy nutrition, and supportive school nutrition and health services.

As SoP was the first country in the region to implement the NFSI, the international NFSI was adapted to the country context, translated into Arabic, and endorsed by the MoE, with support from a national NFSI steering committee. The steering committee included representatives from local and international partners, including UN agencies (UNICEF, WFP, WHO), the MoE, MoH, local NGOs and others. The MoE, in coordination with a local NGO partner and MoH, led the process and developed Action Plan to implement the NFSI in the country. The plan was endorsed by the steering committee and the MoE designed a practical manual that incorporated national objectives as well as the implementation strategy and guidelines. The MoE approved the initiative and endorsed it under the National School Nutrition Programme which was part of the National Education Strategy.

The initiative launched locally in 2018, included an initial self-assessment conducted by 24 schools (10 schools in the West Bank and 14 in the Gaza strip) who were the first to join the initiative. The assessment was conducted to evaluate the needs of schools in relation to the 26 criteria within the NFSI. Subsequently, an additional 10 schools from the West Bank, of which eight were in northern and middle gov-

ernorates and two in East Jerusalem, joined, bringing the total to 34 schools. Based on the findings of the self-assessment, the schools subsequently developed action plans, outlining key activities to implement the NFS criteria. This was followed by a capacity building programme to teachers and school-aged children to develop school-based policy and action plans.

Key activities within the NFSI implementation

As part of this initiative UNICEF and partners supported MoE to conduct a number of interventions including broad-based strategy and capacity building activities, awareness rising and communication for change activities, and special events. Specifically, activities included:

- Revising and upgrading the national school nutrition strategy to incorporate the Nutrition Friendly School approach.
- Revising, updating, and translating the Palestinian Maternal, Child and Adolescent National Nutrition Protocol in order to reflect currently accepted best practices on adolescent's nutrition and in line with the NFSI.
- Developing a referral system between schools and primary health care clinics in the targeted governorates to refer any anaemic school-age child for further investigation and treatment.
- Revising and updating, with UNICEF support, the current MOE training package on school nutrition to integrate the NFSI steps and relevant guidelines.
- Supporting the development of a package of nutrition interventions including NFSI standards, which included the revision of curricula to include life skills, health and nutrition promotion messages, alongside physical activities. The MoE and local partners produced several Arabic brochures and leaflets on the NFSI, its objectives, and steps for becoming NFS accredited. These were distributed to all school children and key community representatives.

More specifically, at a school level an additional number of activities were conducted (as outlined in the action plans). Broad activities to support the NFSI included:

- Refurbishing 10 schools to improve the water and sanitation facilities as part of the enabling environment interventions, at school level.
- Providing canteen and sports equipment and hygiene materials to 15 schools.
- Providing micronutrient supplements through MoH, for around 5,490 anaemic children (referred from schools to the primary health care clinics).
- Conducting a capacity-building programme for schoolteachers, administrators and school-age children to develop their knowledge and raise awareness on nutrition behaviours. The capacity building programme involved a 2-day training targeting 34 school principals, followed by a cascade training at school level for 395 teachers and administrative staff.



Anemia screening at AL Yarmouk primary girls school, Hebron, West Bank

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Communication related activities included:

- Awareness-raising sessions on anaemia and lifestyle modifications were conducted. This was through face-to-face sessions and virtual platforms targeting school-aged children.
- Positive messages on healthy diets and hygiene promotion were developed and disseminated. This included the development of an interactive game for school-age children, based on topics within the school health curriculum and included messages on nutritional information and best health practices.
- Educational and communication material for community awareness were developed, these included messaging through radio and television channels on healthy lifestyle practices, nutritious foods, diet diversity and the importance of physical activity. Parents were also provided with educational and informational material regarding the NSFI programme and importance of healthy nutrition.

Special event related activities included:

- Targeted schools conducted monthly or weekly group breakfast events where children were encouraged to bring healthy breakfast foods from their homes to eat together at school.
- At both local and national level, drawing competitions were held in schools to identify the 'best' healthy/ nutrition-related painting. The winning drawings were included in the annual school calendar.
- School open days also presented opportunities for nutrition-related activities in the form of theatre plays and songs composed and produced by children to promote healthy lifestyles. All activities were conducted using the equipment that was delivered to these schools from the NFS programme.
- Several schools (10) developed school-plays for school-age children, targeting healthy habits and nutrition messages, while others developed school gardens and planted vegetables for their own use.

All activities were documented on a closed Facebook group for all the West Bank schools (with 160 active members including school directors, teachers, and health committees).

COVID-19 related impacts and adaptations

The spread of COVID-19 aggravated existing vulnerabilities, affecting children's wellbeing, and further limiting boys' and girls' access to essential services such as education, health and protection. Survey data found that the COVID-19 crisis and associated lockdown measures also affected children and adolescents' dietary and lifestyle habits in SoP². While being forced to stay at home, children became at risk of gaining weight and becoming overweight due to overeating, consuming ultra-processed foods, and a lack of physical activity. This was concerning as SoP² was already increasingly grappling with a triple burden of malnutrition. The new reality obliged the MoE



School girls enjoying breakfast at school during the morning break – Al Yarmouk girls school, Hebron, West Bank

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with UNICEF and partners support to reformulate previously agreed activities under the NFSI and consider online and virtual delivery methods.

The programme's activities shifted to ensure hygiene standards were met and moved to online schooling platforms. Emergency activities included the procurement of new resources for schools such as temperature testing scanners, hygiene kits for school staff and canteen owners, lunch boxes for schoolchildren, dignity kits for girls, soap for handwashing and portable monitors to display educational videos and other messages related to health, nutrition and COVID-19 related precautions. Social and other media platforms (including videos, game applications, helpline services and Facebook posts) were used to promote nutritional messages and physical activity during restrictions. A tele-counselling dietary programme for children, adolescents, and their families was also launched through a hotline. Furthermore, as part of work to shift messaging to digital platforms, a game application was developed on healthy nutrition, targeting school children between 12 and 15 years of age. The game was accessible for free use via the google store. The idea behind the application was that it could be downloaded onto parents' phones so that both parents and children could learn and play at the same time. The game consisted of 12 levels, each of which addressing one topic related to healthy eating and physical activity.

Furthermore, the capacity building component of the initiative shifted to an online platform. The online training was organised to target participants, including the principals from the 10 new schools, as well as field workers and staff within the School Health Department.

Results

The total number of school children reached in the first phase (24 schools) was 12,929, in both the West Bank and the Gaza Strip (3,453 in the West Bank, with 61.7% girls, and 9,473 in the Gaza Strip with 93.4% girls). In the second phase, an additional 10 schools were added to the programme in the West Bank, including East Jerusalem. In these additional schools, 3,709 schoolchildren were reached, of whom 47% were female. In total 16,638 schoolchildren benefited from schools activities, including haemoglobin and anthropometry screening, awareness sessions on healthy lifestyles and nu-

tritious foods, hygiene promotion activities, and other physical education activities implemented through the NFSI programme. In addition, almost 395 teachers from all 34 schools were trained within the capacity building programme. One-day face-to-face training to introduce the updated protocol was conducted at the end of February 2020 in the Gaza Strip and six five-hour virtual training sessions were conducted for the West Bank. The virtual training sessions in the West Bank included almost 100 participants from different Palestinian and international institutions including the MoH, the MoE, local universities, United Nations Relief and Works Agency, international and local NGOs.

To measure the impact of the NFSI in 2020, UNICEF supported the MoE and a local NGO partner to conduct haemoglobin and anthropometric assessments of school-age children before the intervention, to assess the prevalence of anaemia among school-age children. A total of 16,638 children from the 34 NFSI Schools, (61% girls) were screened by school health teams. Thirty-three percent of screened school-age children (5,490) were found to be anaemic and 22.7% of those surveyed were found to be underweight, while, on the other hand, 35.3% of those were found to be overweight or obese. Anaemia figures were little changed from the previous 2013 Micronutrient Survey, however the burden of school aged children with overweight and obesity appeared to have increased.

In response to the screening results, UNICEF procured micronutrient supplements which were administered through MoH facilities to anaemic school-age children. In addition, an SMS-based feedback mechanism was established between parents and schoolteachers, to ensure that children's nutritional status (using height and weight measurements) were monitored appropriately. Central to this was the follow-up of anaemia treatment and check-ups at health clinics.

Within the NSFI, efforts were also made to improve monitoring systems and data availability, including indicators on the nutrition of school-age children (anaemia prevalence rates, nutritional status estimates, including obesity rates).

² Living with the Covid-19 pandemic: adolescent experiences in the State of Palestine (Gender & Adolescents Global Evidence: August 2021)



School boys participating at the nutrition drawing competition – Al Yaqoubiyeh boys school, Hebron, West Bank

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Successes, challenges and lessons learned

Successes

One of the biggest success of the initiative, was ability of the MoE with support from UNICEF and partners to reach more children; so, in total 14 schools were reached instead of the 10 originally targeted in the Gaza Strip. In the initial stage of the NFSI, 20 schools were targeted (10 in the West Bank and 10 in the Gaza Strip), but in Gaza out of the ten school buildings, 4 buildings are hosting double shift schools, this means that additional 4 schools joined this initiative reaching a total of 14 primary schools. Due to the high population density within the Gaza Strip, schools are working in the two shifts approach with large number of school children. Around 75% of Gaza's elementary schools operate in two shifts.

Nutrition among school age children became a national priority. As a result? Of the implementation of innovative NFSI and inter-ministerial coordination, Palestinian authorities committed to enhance nutrition among school age children and to ensure proper actions to address malnutrition among this age group.

The government commitment for this programme offered additional opportunities: to integrate a chapter on adolescent nutrition as well as a chapter on COVID-19 and its implications for nutrition outcomes in the Maternal, Child and Adolescent National Nutrition Protocol (MCANNP). This is the first time for the SoP to include the adolescent nutrition in the national nutrition protocol and to define clear procedures and steps to address screening and treatment of malnutrition among adolescents. Though the COVID-19 pandemic brought many challenges, it allowed a quick shift of the programme modality to digital platforms including the MOE online school platform, while mobilizing and actively engaging school-age children in the dialogue about healthy nutrition through activities such as the nutrition pyramid game application which was deemed a success reaching 16,638 school age children. Additionally, awareness among school-age children towards healthy nutrition increased.

Challenges and bottlenecks

The implementation of the NFSI also faced a number of challenges. The absence of a National Nutrition Adolescent protocol, including clear procedures on school-age children nutrition

screening at the school level, turned out to be a tremendous challenge in the early stages of implementation, as well as the lack of a clear referral system for anaemic adolescents from schools to health facilities. To overcome this challenge, the MOH and MoE, with UNICEF and partner's technical support, revisited the National Nutrition Protocol and included procedures for adolescents including for referrals of malnourished adolescents. The revised protocols greatly helped to ensure that adolescent nutrition was prioritised and that school-aged children received nutrition screening. It further enabled a streamlined referral process so that children were given adequate support and weren't 'lost' between education and health services.

Coordination among various nutrition partners represented another challenge. In order to enhance the dialogue on adolescents nutrition, UNICEF coordinated and supported MOH to hold frequent meetings at the national and sub-national level including the Gaza nutrition technical working group. This engagement helped improve inter-ministerial coordination as well. Understandably, the spread of COVID-19 led to many challenges as activities had to shift from in-person to remote engagement. Weak internet connectivity in some areas limited school-age children participation in online activities. In order to overcome these challenges, many innovations were developed as those listed above. This allowed the NFSI to continue in spite of the pandemic.

Lessons learned

One of the most valuable lessons learnt during the NFSI implementation was the importance of inter-ministerial cooperation and engagement of all relevant nutrition partners working within health, education, protection and WASH sectors and communities to address the malnutrition among school-age children. This resulted in the organization of frequent consultation workshops which enabled the discussion of learnings and how to overcome any challenges. At the national level, a strategic consultation workshop entitled "Investment in Nutrition in Palestine" was organized, in which the NFSI initiative was presented and discussed. This workshop resulted in key recommendations incorporated in the Palestinian NFSI and taken into consideration for future phases of scale up throughout the Gaza Strip and the West Bank. Some of the recommendations are reflected above and included:

- The importance of updating the National Nutrition Protocol to include adolescent nutrition,
- The need to adopt the NFSI as a MoE policy to scale up the initiative across the country,
- The need to ensure standards were set for Nutrition Friendly Schools,
- The importance of regularly engaging communities and particularly parents in the initiative to ensure that the activities in the NFSI were sustained and that, as far as possible, healthy eating behaviours were maintained.

Such lessons are useful for other countries to reflect on when implementing the NFSI approach.

Conclusion

UNICEF and nutrition partners were able to implement the NFSI activities in State of Palestine to a high standard, despite the challenges faced, particularly in light of COVID-19. A wide range of innovative activities were developed at school level before the pandemic which laid the groundwork for the implementation during the pandemic. In the coming years, UNICEF and national partners are looking to expand the implementation considering following activities:

- Continued advocacy with MoH and MoE to implement updated protocols
- Scale-up the initiative to all schools in Palestine; including public, private and United Nations Relief and Works Agency (UNRWA) schools.
- Continued community engagement through communication for development initiatives to young people and parents to promote healthy lifestyles and good nutrition including support to maintain the interactive nutrition game platform, and help line for counselling.
- Generating evidence and measuring results of innovative NFSI approach and impact on nutritional status of school age children

For further information, please contact Selena Bajraktarevic at sbajraktarevic@unicef.org. Additional media content for the initiative can also be found via the following link:

<https://www.facebook.com/groups/nutrition-friendlyschools/permalink/809959116176764/>

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Use of media to engage school-age children and adolescents to improve their nutrition and health

By Stephanie Wrottesley

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What this article is about: Across low- and middle-income countries in particular, traditional forms of media continue to influence dietary choices and behaviours with digital media playing an emerging role. This article showcases the innovative ways in which media-based platforms are being used to engage school-aged children and adolescents to tackle malnutrition across diverse settings.

Key messages:

- In Timor Leste, the *Lafaek* school magazine has been used as a tool to support learning in schools since 1999 and a special edition of the magazine was created as a tool to improve the nutrition behaviours of adolescents.
- UNICEF Pacific engaged children and adolescents in remote Pacific regions by developing 'The Pacific Kids Food Revolution (PKFR)', a reality television series featuring instructional cooking segments.
- In India, the 'Eat Right School' programme was designed by the Food Safety and Standards Authority of India as an interactive learning model to promote the development of healthy and sustainable eating habits by schoolchildren, with 53,043 schools registered to date.
- UNICEF Zimbabwe hosted a 'Nutrition Hackathon' event, mobilising adolescents by calling on them to design digital solutions to improve the health and nutrition of themselves and their communities.

As children and adolescents age, they experience rapid physical, mental and emotional growth and development which shapes their nutrition and health status into adulthood. This has long-term implications for their wellbeing, economic productivity and susceptibility to disease, as well as that of their future offspring (Patton et al, 2016). The social determinants of health also broaden with age and independence, becoming increasingly influenced by peers, communities, cultural beliefs and practices, education, media and economic freedom (Viner et al, 2012). As a result, school-age children (SAC) and adolescents are susceptible to adopting poor lifestyle behaviours including unhealthy diets, low levels of physical activity and too much time spent sedentary. While the global prevalence of underweight declined from 9.2% to 8.4% in girls and 14.8% to 12.4% in boys 5-19 years of age between 1975 and 2016, a staggering 75 million girls and 117 million boys were still moderately or severely

underweight worldwide in 2016 (NCD Risk Factor Collaboration, 2017). In the same year, 50 million girls and 74 million boys were obese.

Qualitative data from eight sites across India and sub-Saharan Africa described the complex drivers of adolescents' diet and activity behaviours including transitions in nutrition knowledge, shifts in the economic and social contexts in which adolescents live and the changing power dynamics between adolescents and their caregivers (Weller et al, 2020). While adolescents commonly understand what constitutes unhealthy foods, their consumption of these foods is often influenced by vulnerability to marketing as well as adolescents' desires for increased independence, peer engagement and social belonging (Weller et al, 2020). During workshops with representatives from 18 countries around the world, adolescents similarly described family, social media and the internet as the primary drivers of their food choices, followed by television

and radio, friends, branding, advertising and celebrity endorsements (Fleming et al, 2020). Across low- and middle-income countries in particular, traditional forms of media (including television, newspapers and radio) continue to influence dietary choices and behaviours with digital media playing an emerging role. Given these complexities, different approaches to behaviour change are needed for youth that engage them in identifying the interventions that work and developing innovative and accessible methods of implementation.

While the behaviours adopted during childhood and adolescence may, to an extent, be driven by the use of screens and digital devices such as televisions, computers and mobile phones, these media-based platforms also provide unique opportunities for youth engagement (Chassiakos et al, 2016). For example, adolescents are highly connected on social media and have been shown to access information on diet, physical activity and weight control behaviours via these platforms. Social media, television and magazines are also influential in shaping adolescents' perceptions of body image and the celebrities featured on these platforms commonly inform adolescents' views of the ideal body shape (Fleming et al, 2020). A number of examples of using media-based platforms in nutrition programming for SAC and adolescents exist. These provide useful insight into what works to engage youth in the design and delivery of nutrition and health interventions.

In Timor Leste, the *Lafaek* school magazine has been used as a tool to support learning in schools since 1999. Through a partnership between CARE Australia and the local government, four bimonthly editions of the *Lafaek* magazine are produced and distributed as a widely trusted source of educational content, focusing on improving literacy, numeracy, critical thinking and healthy living. Given the widespread distribution of, and engagement with, the print magazine in schools, TOMAK, in partnership with Adam Smith International and Mercy Corps, developed a Special Edition of the *Lafaek* magazine as a po-



Students participate in a nutrition session activity exploring three main food groups in Timor-Leste

tential tool to improve the nutrition behaviours of adolescents (see Case Study 1). This Special Edition focused on encouraging students to consume breakfast before school and to select healthier snacks and drink water during the school day. Results from pre- and post-test questionnaires demonstrated the positive effects of the magazine on students' knowledge and practice of healthy eating behaviours. These effects were greater when coupled with two-hour facilitated nutrition sessions that allowed for interactive engagement around the magazine topics.

Previous research has shown that adolescents have a preference for 'hands-on' learning about nutrition (Fleming et al, 2020). Teaching children and adolescents practical skills related to cooking, gardening and visiting markets and restaurants has also proved effective in supporting them in the selection and preparation of healthy meals (Muzaffar et al, 2018). Such an approach was utilised by UNICEF Pacific in the development of a television series, 'The Pacific Kids Food Revolution (PKFR)', in which reality television was used to reach children and adolescents in remote areas of the Pacific Islands, including Fiji and Samoa, with engaging and instructional cooking segments (see Case Study 2). It also appealed to adolescents' appreciation for celebrity endorsements by including a celebrity chef and a local athlete in cookery teams with groups of adoles-

cents to inspire adolescents to champion the consumption of healthy, local foods. This approach has positively influenced the diets of between 29% and 59% of the participants in different Pacific Islands. In addition, the merits of PKFR prompted the Fiji Ministries of Health and Education to join the 'Pacific Kids' through a launch of the PKFR on World Children's Day.

In India, the 'Eat Right School' programme was designed by the Food Safety and Standards Authority of India as an interactive learning model to promote the development of healthy and sustainable eating habits by schoolchildren (see Case Study 3). Within the programme, schools implement 'Eat Right' activities as part of the school curriculum, as well as during extracurricular activities, using a number of interactive media strategies. These include educational videos and games featuring local celebrities, online challenges and quizzes as well as social media engagement strategies. The campaign has registered 53,043 schools to date and, while scale-up and programme activities were slowed by the COVID-19 pandemic, the programme provided a good basis for engaging students through online webinars and competitions. For example, a total of 4,587 schools participated in the online poster and photography challenge in 2020 that focused on healthy eating as a way of life and food safety in the context of COVID-19.

As described by the World Health Organization (WHO) in their guidelines for implementing effective actions for improving adolescent nutrition (WHO, 2018), the participation of adolescents in programme design is an important component of adolescent-targeted programme success. This approach was used by UNICEF Zimbabwe who hosted a 'Nutrition Hackathon' event during which adolescents designed digital solutions to improve the health and nutrition of themselves and their communities (see Case study 4). One of these solutions, the YOLO4Health application, is now a registered start-up company which allows young people to access accurate health and nutrition information via a web-based social platform. To date, Yolo4Health has engaged 1,149 followers across Facebook, Twitter, Instagram and the Yolo4Health app with a minimum of 50 likes received on average per post. Usage across a range of social media platforms helps to widen the reach of the app and discussions are ongoing around a partnership to assist with financing and further growth.

Overall, these case studies showcase the innovative ways in which media-based platforms are being used to engage SAC and adolescents in the design and delivery of interventions to tackle malnutrition across diverse settings. These tools can deliver nutrition education and facilitate learning while providing accessible platforms for two-way engagement with children and adolescents themselves. They also offer opportunities for youth to play a central role in designing creative interventions that appeal to their needs, desires and aspirations, thereby fostering buy-in and accountability to the solutions developed. Interactive digital platforms should be further harnessed to provide social contact and support in future nutrition programming for SAC and adolescents (Chassiakos et al, 2016; Chau et al, 2018). This will help to encourage peer-to-peer interaction and allow for collective content creation and sharing across social networks and communities. These innovative approaches should be complemented with robust data monitoring systems to track the impact of the programmes, adapt and improve solutions and to inform scale-up.

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Case Study 1

Assessing effectiveness of an interactive magazine aimed at influencing nutrition behaviours among school-attending adolescents in Timor-Leste

By Sarah Meyanathan, Kristine Larsen and Lindsey Pexton

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Background

Despite representing over 25% of the population in Timor-Leste, adolescents have historically been neglected in national nutrition data and programming. However, existing data indicates that, based on their nutrient needs, the diets of adolescent girls account for 45% of the dietary cost of households, more than any other family member. Thus, only one in four households in Timor-Leste are estimated to be able to afford a diet that meets the nutrient requirements of adolescent girls (World Food Programme, 2019). Recently, due to an increased global focus on the nutrition of adolescents, there has been growing interest in this critical life stage in Timor-Leste. In 2019, the To'os Ba Moris D'iak (Farming for Prosperity) programme (TOMAK) collaborated with Adam Smith International and Mercy Corps to test whether an interactive magazine developed for adolescents 10-19 years of age is an effective approach to improve the dietary behaviours of adolescents in schools.

Formative research conducted by TOMAK and the World Food Programme (WFP) in 2018 revealed that adolescents in Timor-Leste trust what they read in CARE's Lafaek educational magazine. The well-known magazine is distributed nationally through schools, targeting primary school children and their communities. As a result of the formative research findings, TOMAK, WFP and CARE collaborated on a Special Edition Lafaek magazine that focused primarily on nutrition-related behaviours that are within adolescents' control, including:

1. The selection of healthy and balanced snacks at school
2. Selection of water as the healthiest drink choice
3. Consumption of breakfast before going to school

Whilst formative research was critical in identifying these key adolescent nutrition behaviours, additional concept testing of different versions of the magazine was required to understand what and who adolescents perceived to be 'cool' and 'fun'. This was an essential component of developing a magazine that would effectively engage adolescents.

To accompany the magazine, TOMAK also developed a series of three, two-hour facilitated nutrition sessions. The sessions were led by programme staff and used the magazine content as interactive tools (e.g., stories and games) to encourage adolescent action planning. The session pack included a facilitator guide and checklist to ensure consistent, high-quality delivery of the sessions.

The effectiveness of the magazine as a standalone tool compared to its use in conjunction with in-person nutrition sessions was assessed in 270 students from four high schools between August and December 2019. A pre/post-test questionnaire was administered to samples of adolescents who either participated in the nutrition sessions using the magazine or who only received the magazine at school.

Results

The results of the pre-post tests showed that students' understanding of nutrition topics improved in both study groups (nutrition sessions + magazine (NS) vs. magazine only (MO)). Based on the percentage of correct answers from pre-

References

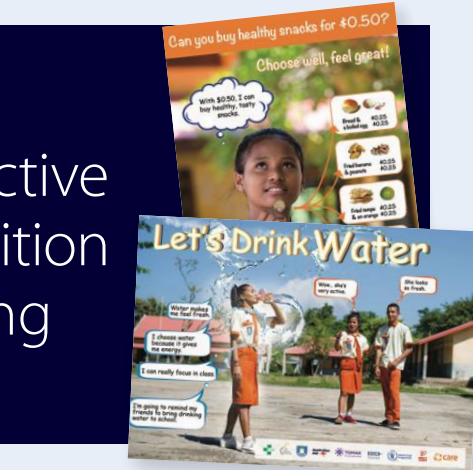
Global Nutrition Report (2020) Country profiles: Zimbabwe. Available at: <https://globalnutritionreport.org/resources/nutrition-profiles/africa/eastern-africa/zimbabwe/>

to post-tests, students developed a greater understanding of the importance of eating a wide variety of foods (7% to 71% for NS vs. 12% to 99% MO), water being the healthiest drink option (57% to 100% NS vs. 60% to 74% MO) and the benefits of eating a healthy breakfast (70% to 94% NS vs. 66% to 78% MO) and healthier snacks (43% to 78% NS vs. 53% to 57% MO). Self-reported consumption of sweetened drinks decreased from pre- to post-test (33% to 7% NS vs. 20% to 12% MO). Adolescents also demonstrated greater confidence in their abilities to positively influence the nutrition practices of their peers (30% to 55% NS vs. 46% to 64% MO). Overall, the study showed a greater impact in the group that received nutrition sessions alongside the magazine, allowing for further engagement around key nutrition practices and strengthening adolescents' confidence and ability to change their own behaviours and to influence peers.

Next steps

Testing the magazine's content and evaluating the impact of the tool facilitated the development of a high-quality product and demonstrated the effectiveness of the standalone interactive magazine (TOMAK, 2021). The evaluation also contributes to discussions on the pay-off between participant reach and impact since the effects were greater when the magazine was combined with face-to-face interactions.

For more information, please contact Sarah Meyanathan at Sarah.Meyanathan@tomak.org



A female student reads the Lafaek special edition magazine on adolescent nutrition in Timor-Leste



Pacific Kids Food Revolution engages children across the region to promote healthy eating

© Pacific Island Food Revolution

Case Study 2

Pacific Kids Food Revolution (PKFR): The innovative way teenagers are leading the way in the Pacific Islands to improve nutrition

By Cate Heinrich, Pradiumna Dahal and Wendy Erasmus

Cate Heinrich is Chief of Communication with UNICEF Pacific. She has two decades of experience working in the communication and education sectors in Asia Pacific, Eastern Africa, Australia and the UK in both the humanitarian and development fields.

Pradiumna Dahal is a Nutrition Specialist with UNICEF Pacific. He has almost two decades of experience in public health nutrition and food security policies and programmes in both development and humanitarian contexts. He was one of the leaders in the formulation and implementation of the Multisector Nutrition Plan and the Scaling Up Nutrition Movement in Nepal.

Wendy Erasmus is UNICEF Pacific's Chief of Child Survival and Development. She is a specialist in mother and child health in developing contexts. Her career in international emergency and development work spans more than 25 years, four of which have been with UNICEF Pacific.

The authors would like to acknowledge Robert Oliver from the Pacific Island Food Revolution and the UNICEF Pacific Ambassador, Olympian Pita Taufatofua, for their partnership and support to this initiative.

Background

In the Pacific Islands, children and adolescents are exposed to a triple burden of malnutrition, including stunting, micronutrient deficiencies and overweight/obesity. As part of its programme to tackle the triple burden of malnutrition in 14 island nations, UNICEF Pacific partnered with the Pacific Islands Food Revolution (PIFR), an innovative programme that promotes local, healthy food across the region, to create a spin-off television series, the Pacific Kids Food Revolution (PKFR). The PKFR uses reality television as a stimulating, evocative and entertaining medium to promote healthy eating to children living in remote areas in the Pacific. The short television programmes of about a five minute duration use instructional formats with step-by-step recipes, making them usable by government bodies, schools, health workers and communities. During the films, adolescents lead cooking segments using locally available, nutritious foods.

PKFR began as a collaborative venture in 2019 during which UNICEF partnered with PIFR's celebrity chef, Robert Oliver, to produce the final episode of PIFR's maiden season titled 'Foods for the First 1,000 days'. During production of season two, UNICEF and PIFR teamed up to design an episode on school lunches after which the spin-

off series, PKFR, was created. This series featured three cookery teams comprised of Robert Oliver, UNICEF's Pacific Ambassador, Olympian Pita Taufatofua, and six dynamic adolescents from the Pacific. During this collaboration, nutritious and tasty recipes were designed for PKFR using locally available foods and episodes were aired to coincide with the release of PIFR season two.

Results

PKFR was broadcast across 26 networks, reaching approximately five million people each week. Alongside this, radio and social media platforms were used to reach several million more people with key nutrition messages encouraging young people to cook healthy, local recipes with their families. The success of the series was credited to the dedication and creativity of the adolescents who brought it to life. This inspired Fiji's Ministries of Health and Education to commit to healthy eating by joining the Pacific Kids 'food warriors', the youth participants in the TV series, in a launch of the PKFR on World Children's Day.

A recent report (Busara, 2021) showed that the PIFR TV series, including the PKFR segments, inspired, educated and promoted cooking with local, healthy food. Use of the recipes gained traction online, reaching millions via social media platforms. Of the survey participants who engaged

with the TV programme, 42% indicated that they had improved their diets after watching the series. This included 38% of participants in Fiji, 29% in Tonga, 46% in Samoa and 59% in Vanuatu. In 2021, UNICEF Pacific partnered with the national broadcasters of eight countries who engaged thousands more children via children's TV shows, questions and answers with children on healthy eating, celebrity engagement, cooking at home during COVID-19 lockdown and school activities.

The recent report also showed that, within the context of COVID-19, families were more interested in learning about local food (Busara, 2021). This shift was related to reductions in personal income, the restricted availability and affordability of imported foods and the increased time available to grow ingredients and prepare meals at home.

Next steps

This partnership provides insight into the power of combining education and entertainment via media-based platforms (edutainment) to reach large audiences and positively influence eating habits, particularly focusing on greater consumption of locally available, healthy foods. It illustrates how to engage celebrity chefs and athletes to tap into their reach and connection with adolescents in order to promote nutrition literacy. Most importantly, it illustrates the influencing power of adolescents on healthy behaviours. UNICEF and PIFR are committed to continuing the prosperous partnership – so stay tuned! The trailer for the PIFR episode on school lunches can be viewed at: <https://www.facebook.com/watch/?v=2810670475867505>

For more information, please contact Cate Heinrich at cheinrich@unicef.org

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Case Study 3

Improving eating habits in India: The Eat Right School programme

By the Food Safety and Standards Authority of India (FSSAI), the Ministry of Health and Family Welfare, Government of India



Background

The triple burden of undernutrition, micronutrient deficiencies and rising overweight/ obesity, particularly among children, is threatening social and economic growth in India. At least half of boys (58.1%) and girls (50.1%) 5-19 years of age are underweight while approximately 9.9% of boys and 7.7% of girls are affected by overweight or obesity. Given that childhood dietary behaviours track into adulthood and food preferences are often formed during the school years, cultivating healthy food choices in school-age children via age-appropriate interventions is essential.

The Food Safety and Standards Authority of India (FSSAI) initiated the Eat Right School programme in 2017 as an interactive learning model designed to help schoolchildren to develop safe, healthy and sustainable eating habits. The FSSAI was established under the Food Safety and Standards Act 2006, primarily to set science-based standards for safe and wholesome food and to regulate its manufacture, storage, distribution, sale and import. As part of its core regulatory functions, the FSSAI sets globally benchmarked standards for food safety and uses surveillance mechanisms to monitor compliance and assess food quality.

The aim of the Eat Right School programme is to educate children about food safety and healthy diets, empowering them to take charge of tackling any kind of malnutrition by awareness and sensitisation activities. Within the programme, schools are certified as Eat Right schools based on points awarded for implementing Eat Right activities within the school curriculum and during extracurricular activities under the themes of 'Eat Healthy', 'Eat Safe' and 'Eat Sustainable'. A number of interactive media strategies have been used to allow for the sharing of information and to provide an engaging digital environment.

The initiative began by training master trainers, including school principals, teachers, non-governmental organisation employees, independent experts and nutritionists, via in-person and online platforms. College students were subsequently included to act as mentors. Schools were guided through a 5-step implementation process using a comprehensive and user-friendly online portal. Via this portal, schools were registered, accessed information and nominated schoolteachers and/or parents as health and wellness coordinators. Schools were certified by the FSSAI using an online programme and Eat Right activities were implemented, often within existing school activities. A self-compliance assessment tool was used to monitor, evaluate and submit progress reports. Those schools com-

plying with the Eat Right Matrix were then awarded Eat Right School certificates.

The FSSAI created a rich repository of content that may be adopted into the school curriculum. All resources are openly accessible online and have been incorporated into the School Health Programme by the Ministries of Health and Education. Resources include:

- Information books ('The Yellow Books') and an activity book to provide age-appropriate information on healthy eating habits in 11 regional languages as well as fun-filled activities to reinforce key messages.
- A teacher training manual to provide an in-depth understanding of food safety and nutrition concepts that can be integrated into teacher training programmes.
- Food Safety 'Magic Boxes' and booklets that include over 100 easy hands-on tests and experiments to make food science relevant for students.
- Educational videos and games that cover topics of food safety, health, hygiene and nutrition and feature appearances from celebrities such as Virat Kohli, Rajkumar Rao and Sakshi Tanwar to engage students.
- Guidelines for the safe re-opening of school canteens that provide clear and actionable guidance for safe operations through the prevention, early detection and control of COVID-19.

The Eat Right School programme employs several engagement strategies aimed at children and adolescents, including:

- An Eat Right Creativity Challenge (ERCC) that capitalises on children's creativity to encourage healthy dietary habits. Two phases of the challenge were successfully completed in 2018 and 2020. In 2018, the ERCC included a range of activities: an 'On the Spot Poster' Competition, a Wall Art Competition, the Eat Right Sustained Champion School Competition and the Digital Creative Competition. In 2020, the challenge was conducted online due to COVID-19 restrictions and included poster making and photography on the themes of 'Eat Right a way of life' and 'Food safety during COVID-19'.
- An online Eat Right Quiz that uses an interactive learning process to engage students and encourage them to improve their food habits.
- Social media engagement focusing on various monthly thematic topics, including the health benefits and sources of various food groups and micronutrients, incorporating fruits and vegetables in the diet, mythbuster challenges and a 21-day challenge to reduce fat, sugar and salt intakes.

Results

To date, 53,043 schools have registered and approximately 50,000 activities have been conducted. For example, during the programme's introduction, 15,000 mascot activations were carried out in schools across the country to sensitise them to the programme and inform children and parents about healthy eating habits. Although school closures due to the COVID-19 pandemic slowed the pace of the programme, efforts have been made to engage students through online webinars and competitions. For example, in 2018, over 75,100 students from 3,621 schools participated in the ERCC. During the second ERCC conducted online in 2020, a total of 4,587 schools participated.

Since the programme is voluntary, participation by schools has grown organically and the learning and experience of different stakeholders has informed the development of a self-compliance assessment tool: the Eat Right Matrix. While no data is currently available on the impact of the programme, a monitoring and evaluation strategy is being developed in collaboration with domain experts to be implemented once schools resume their normal routine. Since the certification programme is administered through an online portal accessed by school administrators and health and wellness coordinators, implementing a self-structured questionnaire via the portal will enable data collection over the period of certification.

Next steps

The FSSAI plans to continue the efforts via the online platform, as well as through parallel activities to improve school environments, with a focus on ensuring that children have access to safe, healthy food in and around school. To support this effort, in 2020 the FSSAI developed a new regulation, the Food Safety and Standards Regulation, focusing on safe food and balanced diets for children in school. It does not permit junk food (foods high in fat, salt and sugar) to be sold or marketed in schools or within 50 metres of the school gate. To ensure compliance, food safety commissioners of each state conduct enforcement drives and inspections to ensure the Eat Right School programme is implemented successfully, adhering to the regulations. Finally, finalising and implementing a robust monitoring and evaluation mechanism is a priority for the Eat Right School programme to assess impact and inform scale-up.

For more information, please visit the FSSAI's website at <https://eatrightindia.gov.in/eatrightschool> or contact the FSSAI at snfatschool@fssai.gov.in

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Case Study 4

Digital solutions developed by youth to drive social behaviour change for nutrition in Zimbabwe



A student explains how his group's digital app works during the hackathon in Harare

By Progress Katete and Pauline Mapfumo

Progress Katete is a UNV Nutrition Specialist at UNICEF, passionate about advocating for children's rights and elevating and amplifying the voice of young people. She has vast experience in working on adolescent and youth engagement programmes, public health nutrition interventions and building the capacity of implementing partners.

Pauline Mapfumo is a nutritionist and co-creator of the YOLO4Health app. She is responsible for nutrition technical development and the creation of nutrition blogs and messages on the YOLO4Health platform.

The authors would like to thank UNICEF for the financial and technical support provided during the design and implementation of the project and the BOOST FELLOWSHIP for the implementation of the nutrition hackathon and technical business development support to the top three hackathon winning solutions during incubation.

Background

In Zimbabwe, approximately a third (32.5%) of boys 5-19 years of age are underweight while a similar proportion of girls are overweight (22.3%) or obese (6.5%) (Global Nutrition Report, 2020). The aggressive and unregulated marketing of unhealthy foods is on the rise, encouraging poor food choices among young people and resulting in increased intakes of unhealthy foods high in fat, sugar or salt.

In 2019, UNICEF Zimbabwe, in collaboration with the Ministry of Health and a local non-governmental organisation, hosted a Nutrition Hackathon, a sprint-like coding event. During this three-day event, youth aged 10-25 years used human-centred design approaches to create digital solutions to the nutrition challenges facing their communities. A total of 55 participants assumed the roles of developers, entrepreneurs, business developers, nutrition enthusiasts and

marketers in teams of five. Their aim was to develop digital nutrition solutions to improve the health and nutrition of their fellow young people. After hours of intensive coding and brainstorming for workable solutions, each team showcased their prototype solutions during a five-minute pitch presentation. Innovations produced during the hackathon were evaluated by a panel of independent judges who were experts in nutrition, business and entrepreneurship, innovation technology and marketing.

The three best solutions were each awarded seed funding of USD1,500 to further develop and scale up their solutions. The three prototype products identified were KULA, a nutrition gaming application, YOLO4Health, a social media-based application providing nutrition messages, and H-globin which provided information to promote iron-rich diets and tests for anaemia using a retinal scanner. These prototypes received mentorship

for three months to support further development. All three teams successfully registered their products as start-up companies and businesses.

Results

Despite challenges such as connectivity and the emergence of the COVID-19 pandemic which affected how team members met and collaborated, one out of the three applications produced a minimum viable product (i.e., a basic version of the product released to consumers) – YOLO4Health. YOLO4Health received a further six months of mentorship during an incubation period. The application was created to provide young people with access to correct nutrition and health information via social platforms which often contain false nutrition and health information. YOLO4Health is currently available as a web-based social platform and can serve as a social behaviour change communication tool. It provides a platform for young people to access information and engage in social dialogues about their health goals, particularly in relation to nutrition and physical activity, in an exciting and engaging manner. To date, Yolo4Health has engaged a collective of 1,149 followers across Facebook, Twitter, Instagram and the Yolo App with the numbers continuing to rise. On average, posts receive a minimum of 50 likes and use across a variety of social media platforms widens the reach with followers.

Next steps

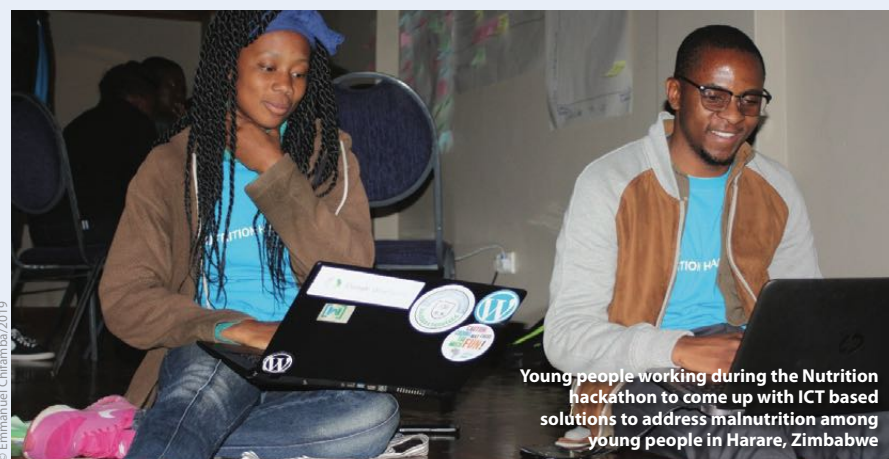
YOLO4Health is currently working on setting up an agreement with an organisation that provides financing and mentorship to grow small start-ups. This partnership will assist in the further development of the application, incorporating additional features such as physical activity tracking, as well as in marketing the app to new users.

A short video of the hackathon event can be found at: <https://youtu.be/wjSI-MCdYwg>

For more information, please contact Progress Katete at pkatete@unicef.org

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Young people working during the Nutrition Hackathon to come up with ICT based solutions to address malnutrition among young people in Harare, Zimbabwe



COVID-19 pandemic impacts on adolescents' lives in sub-Saharan Africa

This is a summary of the following paper: Wang, D., Chukwu, A., Millogo, O., Assefa, N., James, C., Young, T., Lankoande, B., Workneh, F., Hemler, E. C., Korte, M. L., Mattei, J., Soura, A. B., Sie, A., Oduola, A., Berhane, Y., & Fawzi, W. W. (2021). *The COVID-19 Pandemic and Adolescents' Experience in Sub-Saharan Africa: A Cross-Country Study Using a Telephone Survey*, *The American Journal of Tropical Medicine and Hygiene*. Available at:

<https://europepmc.org/article/med/34161298>

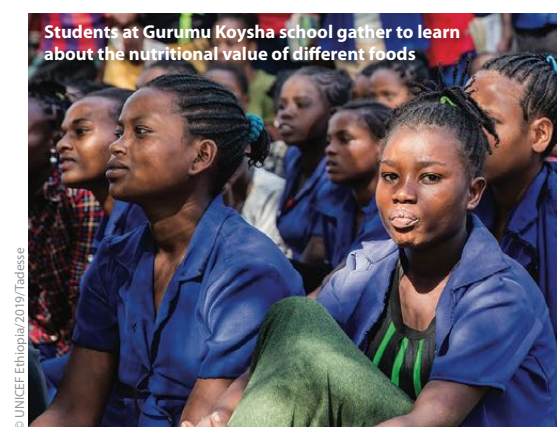
Despite low COVID-19 case fatality rates among adolescents, the public health measures put in place to combat the pandemic may negatively impact the development and health of adolescents. This study – conducted in rural and urban locations in Burkina Faso, Ethiopia and Nigeria using computer assisted telephone interviews – examines COVID-19 knowledge, perceptions and preventive strategies among 1,795 adolescents aged 10-19 years and the impacts of the pandemic and its mitigation strategies on various aspects of the lives of adolescents in sub-Saharan Africa.

The results show that adolescents' knowledge of COVID-19 symptoms, transmission and prevention was limited, especially in rural settings. One major impact of the pandemic on adolescents was the exacerbated inequities in education.

Among adolescents who were enrolled in school, most reported school closures in response to the pandemic (> 95% in urban Burkina Faso and both sites in Ethiopia and ~60% in rural Burkina Faso and both sites in Nigeria). Many adolescents (ranging from 23-81% across the study sites) did not receive any education during the pandemic. Many adolescents (44-83%) self-assessed as having less ability to learn during the pandemic. In Burkina Faso and Ethiopia, around half of the adolescents (43-51%) perceived that it would be very difficult to catch up on their education after the pandemic. Even in countries where alternative education channels were available, these were not accessible or affordable to adolescents living in poverty or in remote areas. Another major impact of the pandemic on adolescents was evidence of reduced food intake. Decreases in the consumption of

the major food groups were common across the sites including a reduction in the consumption of staples (ranging from 9-54%), pulses (29-49%), fruits (18-41%), vegetables (3-34%) and animal-source foods (11-29%). In terms of the impact on mental health, levels of depression, anxiety and psychological distress were generally reported as low across all the study sites.

Understanding the impacts of the COVID-19 pandemic on adolescents is important to the design and targeting of interventions during and after the pandemic especially in sub-Saharan Africa where adolescents are often overlooked in public programming. This study serves as an initial evidence base for policymakers to design and implement such interventions.



Students at Gurumu Koysha school gather to learn about the nutritional value of different foods

Dietary intake and practices of adolescent girls in low and middle-income countries: A systematic review

This is a summary of the following paper: Keats, E.C., Rappaport, A.I., Shah, S., Oh, C., Jain, R. & Bhutta, Z.A. (2018). *The Dietary Intake and Practices of Adolescent Girls in Low- and Middle-Income Countries: A Systematic Review*. *Nutrients*, 10(12), 1978. Available at:

<https://doi.org/10.3390/nu10121978>

Adolescents represent an important and often overlooked group in nutrition programming and, in many low- or middle-income countries (LMICs), they regularly face a double burden of malnutrition: undernutrition (stunting, wasting, micronutrient deficiencies) and overnutrition (overweight/obesity). Adolescent girls are disproportionately affected, with iron, vitamin A and iodine deficiency being particularly prevalent in this group. To summarise the dietary intakes, patterns and practices of adolescent girls, defined as those aged 10-19 years, in LMICs, a systematic review of both grey literature and academic databases was completed according to the PICO framework. This constitutes the first review to look principally at the dietary patterns of adolescent girls in a quantitative manner that

would allow for more informed policy and programming initiatives targeted towards this vulnerable population.

Of the 227 articles meeting the inclusion criteria, 59% were conducted in urban populations and 78% in school settings. Studies represented LMICs across six regions: Africa (n=36), East Asia and Pacific (n=47), Europe and Central Asia (n=9), Latin America and the Caribbean (n=35), Middle East and North Africa (n=46) and South Asia (n=54).

Heterogeneity was apparent between the study methodologies. Mean energy intake was lower in rural settings (1621 ± 312kcal/day) compared to urban settings (1906 ± 507kcal/day). Self-reported daily consumption of nutritious foods was low; on average, 16% of girls consumed

dairy, 46% consumed meat/fish, 44% consumed fruits and 37% consumed vegetables. By contrast, energy-dense and nutrient-poor foods were consumed four to six times per week by many, namely sweet snacks (63%), salty snacks (78%), fast foods (23%) and sugar-sweetened beverages (49%). Forty per cent of all adolescent girls reported skipping breakfast but 49% reported snacking during the day.

Despite the non-representative nature of the studies included in this review, it nevertheless highlights the dietary shift among adolescent girls residing in LMICs towards a more 'western' diet, filled with ultra-processed foods. It is evident that dietary habits are suboptimal within this group and that the already apparent double-burden of malnutrition is likely to become entrenched while remaining on this dietary trajectory, leading to major non-communicable disease implications in low- and middle-income settings.

Study heterogeneity within this review highlights the need for more consistent, representative nutrition data for adolescent girls to address both current data limitations and allow for comparison between studies. The authors highlight that this is especially pertinent considering the importance of good nutrition in adolescent girls, particularly those who are pregnant.



Anaemia control programme in Jharkhand, India

© UNICEF/India/2010

Intergenerational nutrition benefits of India's national school feeding programme

This is a summary of the following paper: Chakrabarti S, Scott S.P, Alderman H, Menon P, Gilligan D.O. (2021).

Intergenerational nutrition benefits of India's national school feeding programme. Nature Communications, 12;4248.

Available at: <https://doi.org/10.1038/s41467-021-24433-w>

Globally, 149 million children are too short for their age and over half of these children live in Asia. In 1995, the Government of India launched the Mid-Day Meal scheme (MDM), a social protection programme that provides a free cooked meal to children six to 10 years of age in government and government-assisted primary schools. Meals provided must contain a minimum of 450 kcal and 12 grams of protein. MDM is the largest school feeding programme in the world and has the potential to improve both women's education and height which, in turn, may lead to reductions in stunting among children born to these women. However, to date no studies have examined this intergenerational effect.

This paper studies the intergenerational nutritional benefits of India's MDM using nationally representative data from seven datasets on mothers and their children spanning from 1993 to 2016. Cohorts of mothers were matched by state, birth year and socioeconomic status with data on MDM coverage measured as the proportion of primary-school-age girls receiving MDM.

The study found that the height-for-age z-score (HAZ) among children born to mothers with full MDM exposure was greater (+0.40 SD) than that in children born to non-exposed mothers. Improvements in child height were experienced earlier in states that rolled out MDM in the late 1990s compared to states that scaled up MDM in the 2000s. Associations were stronger among poorer households and likely work through women's education, fertility and health service utilisation. Overall, the study found that MDM was associated with 13-32% of the HAZ improvement in India from 2006 to 2016.

This paper provides evidence that, when intergenerational effects are considered, the complete benefit of school feeding programmes at scale for linear growth is much greater than previously understood. The finding that programmes that target children six to 10 years of age have the potential to make important contributions to reducing future child stunting is also an important outcome for other transfer programmes that to date have focused primarily on the time between conception and the child's second birthday.

The triple burden of malnutrition among adolescents in Indonesia

This is a summary of the following paper: Rah, JH, Melse-Boonstra, A, Agustina, R, van Zutphen, KG and Kraemer, K (2021) *The triple burden of malnutrition among adolescents in Indonesia. Food and Nutrition Bulletin, 42(Supplement 1).* Available at: https://journals.sagepub.com/toc/fnb/42/1_suppl

By **Kesso van Zutphen** (Sight and Life and Wageningen University & Research) and **Klaus Kraemer** (Sight and Life & Johns Hopkins University)

In many countries, adolescents are facing a nutrition crisis. Despite significant global progress in improving adolescent nutrition, including a renewed focus on anaemia among adolescent girls, major gaps in the research and understanding of this demographic persist. In Indonesia specifically, the triple burden of malnutrition, characterised by the coexistence of undernutrition (wasting and/or stunting), micronutrient deficiencies and overweight/ obesity and related noncommunicable diseases, is present among its 45 million adolescents. Approximately one in four adolescent girls in Indonesia suffers from anaemia while nearly one in seven adolescents is overweight or obese.

The recently published supplement, "The triple burden of malnutrition among adolescents in Indonesia", in the Food and Nutrition Bulletin calls for increased attention to adolescent nutrition in Indonesia and beyond. This supplement includes an editorial and eight original research articles written by nutrition experts at Sight and Life, UNICEF, the University of Indonesia and Wageningen University and represents the first comprehensive review of current knowledge on the nutritional status of adolescents in Indonesia. The research presented includes qualitative evidence on the dietary and physical activity behaviours of adolescent girls and boys and the factors influencing these, the association between body image perceptions and nutritional status, eating habits and physical activity behaviours, the determinants of overweight and obesity among adolescents according to the Indonesia National Health Service 2013-2018 and Family Life Survey 2014-2015 data and three studies on anaemia and its association with micronutrient intake, knowledge attitudes and practices and biological and

behavioural factors such as intake, absorption, infectious disease and inflammation.

The supplement's findings show that the triple burden of malnutrition is driven by shifting diet and physical activity patterns including reduced activity in- and out-of-school and unhealthy eating habits such as frequent snacking and eating outside of the home. Adolescents' body image perception was identified as a predictor of eating and physical activity patterns and the number of years of maternal education was positively associated with the odds of overweight, particularly in boys and in the eldest siblings. In Indonesia, iron deficiency is likely to be responsible for a large proportion of anaemia cases although the need to acknowledge and explore other potential causes is also emphasised.

Overall, this supplement highlights the need for further research on the various determinants of the triple burden of malnutrition, evidence-based interventions that are supported by large-scale implementation research and evaluation and effective delivery platforms to reach the most vulnerable groups of adolescents and to change adolescent behaviours. Furthermore, the results emphasise the importance of positioning adolescent nutrition as central to development which will help to safeguard the nutritional wellbeing of today's forgotten generation.

The supplement was launched during an online media briefing¹ hosted by key partners in July 2021. The launch emphasised a clear message that "breaking the cycle of malnutrition starts with adolescents". The hope is that this collection of nine articles will spur the urgent need for interventions, implementation research and relevant programmes to improve the nutritional wellbeing of adolescents in Indonesia and beyond.

¹ Available at: https://www.youtube.com/watch?v=Vf0Zl-i_mDQ



Students harvesting leafy greens at a school in Zambia

© WFP/Sophie Smolders

Addressing knowledge gaps in adolescent nutrition

This is a summary of the following paper: Canavan, C. & Fawzi, W.W. (2019). *Addressing Knowledge Gaps in Adolescent Nutrition: Toward Advancing Public Health and Sustainable Development*. *Current Developments in Nutrition*, 3(7). Available At: <https://academic.oup.com/cdn/article/3/7/inzz062/5485636>

Adolescence is a period of significant physical, cognitive and social development that establishes the trajectory for adult health status. Adolescence marks a second window of opportunity when individuals can catch up on stunted growth during childhood. Improvements in nutritional status can also yield better attendance and performance at school and correcting nutritional deficiencies and improving diets for adolescents allows them to enter pregnancy in a healthier state. Nevertheless, malnutrition remains a key challenge for adolescents in developing countries through suboptimal dietary intake. To stifle these challenges and promote opportunities, knowledge gaps in adolescent nutrition must be addressed.

Firstly, iron and folic acid supplementation is effective in reducing anaemia and preventing neural tube defects. However, optimal implementation strategies to determine the acceptability and effectiveness of the supplementation dose, the delivery and duration of use have yet to be identified. Macronutrient supplementation, namely protein and calorie-dense supplements, offer significant opportunities to enable catch-up growth during adolescence. However, there is a paucity of evidence regarding possible adverse outcomes for those who are overweight or obese.

Secondly, with one third of adolescents globally being food insecure and the average intake of fruit and vegetables for adolescents remaining below World Health Organization recommendations (400g/day), school-based nutrition interventions offer a promising avenue to improve dietary quality in this age group. Nevertheless, more evidence is needed to determine how food environments such as school settings shape dietary behaviours and how this affects adolescent food security and dietary quality.

Thirdly, as almost 20% of women in developing countries have a live birth by the age of 18 and young mothers have greater nutritional requirements due to foetal development while they are still growing, nutrition programmes should be integrated with delayed pregnancy interventions to improve infant and maternal health and nutrition outcomes. Potential interventions should combine adolescent empowerment approaches with community- and school-based approaches.

Closing these knowledge gaps requires a sustained, multi-sector approach from public health actors with health surveillance improvements as well as adolescent, parent and community engagement to determine evidence-based solutions. However, investing in adolescents today offers the promise of lifelong gains for them and their families.

Food systems for children and adolescents

This is a summary of the following special issue: Kupka, R., Morris, S., & Fox, E. (ed) (2020). *Food systems for children and adolescents*. *Global Food Security*. Available at: <https://www.sciencedirect.com/journal/global-food-security/vol/27/suppl/C>

Securing nutritious diets for children and adolescents could be achieved by reorientating food systems to deliver desirable, affordable, safe and sustainable diets. Currently, food systems often ignore the specific needs of children and adolescents, underestimating their potential as change agents and perpetuating the inability of food systems to address malnutrition in this group.

To respond to this issue, UNICEF and GAIN convened a Global Consultation on Food Systems for Children and Adolescents in 2018 that aimed to develop a common narrative and identify priority actions for food systems and diet quality among children and adolescents. A special issue on food systems for children and adolescents in *Global Food Security* reported the priorities identified before and after this consultation.

The first three articles in the special issue indicate that children and adolescents require special attention in food system reorientations for improved diets and that, despite existing data gaps, there is evidence that their dietary intakes are sub-optimal compared to recommendations. Two articles then provide a roadmap on how to reorient food systems to address these challenges. The first presents a conceptual framework, the 'Innocenti Framework', which includes a set of food system drivers (food supply chains, external food environments, personal food environments and behaviors of caregivers, children and adolescents), determinants, influencers and interactions that determine the diets of children and adolescents. The second describes how to translate the *Innocenti* Framework into practical action through a novel six-step assessment

tool. The tool starts by measuring and understanding children's realities and then works back up into the system to identify how food environments and supply systems could make relevant foods more or less available, affordable, appealing and aspirational.

Three further papers present evidence on the key determinants of the food systems outlined in the *Innocenti* Framework. A review of the evidence on food supply chains and their link with food availability and children's and adolescents' diets is presented followed by a review of school- and community-based interventions that aim to shape food environments and their effects on diet outcomes. The next paper identifies the facilitators and barriers to the uptake of interventions that aim to improve the dietary behaviours of children and adolescents and highlights their implications for planning and monitoring future interventions. Despite research gaps, this evidence provides valuable insight into how food supply chains, food behaviours and food environments can support improved diets for children and adolescents.

Next, an evidence review examines child rights violations related to the growing problem of the digital marketing of unhealthy, ultra-processed foods to children and adolescents. Finally, key implications of the issue for public policies and programmes with specific country-level illustrations are outlined.

The evidence presented in this special issue constitutes an important step in reorienting current food systems to deliver 'fit for purpose' actions that work to improve the diet quality of children and adolescents.

Family influences on practices of pregnant adolescents in Bangladesh

This is a summary of the following paper: Pike V, Ramage A.K, Bhardwaj A, Busch-Hallen J, Roche M.L. (2021). Family influences on health and nutrition practices of pregnant adolescents in Bangladesh. *Maternal and Child Nutrition*, 17(S1):e13159. Available at: <https://onlinelibrary.wiley.com/doi/10.1111/mcn.13159>

Adolescent pregnancy can lead to serious risks for both mother and baby, with pregnancy and childbirth complications representing the leading cause of death for adolescents globally. However, adolescents are among those least likely to access healthcare while specific nutrition or antenatal care (ANC) guidelines to support pregnant adolescents are unavailable. This study aimed to understand the experiences and decision-making of pregnant adolescents (aged 15-19 years) in Bangladesh related to ANC and nutrition practices to inform programming for pregnant adolescents.

Peer interviewers conducted qualitative interviews with pregnant adolescents (n=48), adolescent mothers (n=48), adolescent family members (n=64) and healthcare providers (n=32) in the urban slum areas of Dhaka and the rural

areas of Rangpur. Key themes explored included the perception and support of adolescent pregnancy, experiences in seeking ANC, dietary practices, sources of information and the roles of family members. Spheres of influence on adolescent pregnancy were identified through an analytical framework informed by the socio-ecological model that shows how individual behaviour is determined by personal, interpersonal, institutional, community and policy influences.

Respondents described adolescent pregnancy as overwhelming and 'life altering' and a time of increased isolation and reliance on family members. Most families endeavoured to provide adolescents with extra guidance and support. However, this did not always align with the advice from healthcare providers, although most acknowledged the importance of clinical support.

Families greatly influenced adolescent care-seeking, health and nutritional practices with mothers and mothers-in-law emerging as the principal influencers. Husbands also often played an active role although they were more commonly involved in smaller day-to-day decisions, often in relation to spending, than in bigger ones. Families valued both good nutrition and healthcare but financial constraints were commonly described as a barrier. Adolescents valued family support but felt a loss of autonomy and agency upon becoming pregnant. Only half of pregnant adolescents began taking supplements during their first trimester and about half in their second trimester.

Further research is needed to better understand social and cultural practices, family dynamics and systems, the types of support pregnant adolescent girls want and from whom and adolescent experiences of nutrition and health during pregnancy. Youth-led research approaches should be further utilised to tailor services for pregnant adolescents. In addition, it is essential to simultaneously engage adolescents and family members, particularly mothers and mothers-in-law, in initiatives that aim to improve pregnant adolescents' agency and health behaviour. This research can also inform the development of nutrition and ANC guidelines for pregnant adolescents.

Determinates of dietary intake among adolescents in Bangladesh

This is a summary of the following two papers:

- 1) Islam MR, Rahman SM, Tarafder C, et al (2020). Exploring Rural Adolescents' Dietary Diversity and Its Socioeconomic Correlates: A Cross-Sectional Study from Matlab, Bangladesh. *Nutrients*, 12(8): 2230. Available at: <https://doi.org/10.3390/nu12082230>
- 2) Salwa M, Subaita E, Choudhury SR, et al (2021). Fruit and vegetables consumption among school-going adolescents: Findings from the baseline survey of an intervention program in a semi-urban area of Dhaka, Bangladesh. *PLoS ONE*, 16(6): e0252297. Available at: <https://doi.org/10.1371/journal.pone.0252297>

Adolescence is a critical phase characterised by rapid physical, physiological and cognitive development. This period represents an additional 'window of opportunity' to correct deficits due to poor early life nutrition. Increased demand for macro- and micronutrients in this period heightens nutritional vulnerability. Understanding adolescent dietary diversity (DD) is the first step to addressing adolescents' nutritional vulnerability while tackling the multiple forms of malnutrition prevalent in Bangladesh.

The first study aimed to explore DD in a cohort of rural adolescents from Matlab in Bangladesh. The objectives were to: (i) describe and analyse DD and the consumption pattern of foods from different groups along with their social and economic stratification, and (ii) identify the socio-economic and demographic predictors

of inadequate DD among these adolescents. A cross-sectional study nested within a 15-year trial was used to explore DD and its underlying socio-economic predictors among 2,463 adolescents. DD was measured using 24-hour recall.

The second study aimed to describe the fruit and vegetables consumption habits of adolescents in Dhaka in Bangladesh as well as to identify the socio-environmental, personal and behavioural factors that influence these habits using baseline data from an intervention study involving 823 grade 10 students in a semi-urban area of Dhaka.

A total of 42.3% of adolescents had inadequate DD in Matlab. The consumption of nutrient-rich foods varied significantly across gender and socio-economic categories. Belonging to the poorest households, food-insecure households, having mothers with lower educational

attainment and adolescents' attainment of secondary education were associated with inadequate DD. In Dhaka, only 21% of adolescents had five servings of fruit and vegetables a day. Inaccessibility at home was reported as the most perceived barrier. Higher maternal educational attainment, more social support, adequate self-rated practice, positive behavioural intention, higher body mass index, better physical activity and adequate daily sleep were associated with higher fruit and vegetable intake.

The findings highlight the urgent need to invest in formulating and implementing targeted interventions to diversify the diet of rural adolescents. More research is needed into the determinants of dietary intake among adolescents in Bangladesh to enable interventions to effectively address the underlying predictors while targeting those most at risk.





Adolescents involved in an iron and folic acid supplementation programme in India

TALENT Collaboration: Exploring adolescent diet and physical activity in India and sub-Saharan Africa



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By Polly Hardy-Johnson, Susie Weller, Sarah Helen Kehoe, Mary Barker, Abraham Haileamalak, Landing Jarju, Julie Jesson, Ghattu Krishnaveni, Kalyanaraman Kumaran, Valeriane Leroy, Sophie Moore, Shane Norris, Suvarna Patil, Sirazul Sahariah, Kate Ward, Chittaranjan Yajnik and Caroline Fall on behalf of the TALENT collaboration.

The TALENT collaboration also includes Ulka Banavali (BKL Walawalkar Hospital, India), Edna Bosire (University of the Witwatersrand, South Africa), Harsha Chopra (Centre for the Study of Social Change, India), Meera Gandhi (Centre for the Study of Social Change, India), Ramatoulie Janha (MRC Keneba, MRC Unit The Gambia), Shama Joseph (CSI Holdsworth Memorial Hospital, India), Kejal Joshi Reddy (KEM Hospital, India), Elizabeth Kimani-Murage (African Population and Health Research Center (APHRC), Kenya), Egnon Kouakou (PAC-CI, Ivory Coast), Mubarek Abera Mengistie (Jimma University, Ethiopia), Stephanie Wrottesley (University of the Witwatersrand, South Africa) and Pallavi Yajnik (KEM Hospital, India).

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COTE D'IVOIRE, ETHIOPIA, INDIA, SOUTH AFRICA & THE GAMBIA

What this article is about: This article describes the findings from the TALENT Consortium stakeholder engagement, survey and focus group discussions regarding adolescent diet, physical activity and health.

Key messages:

- The study found that all adolescents knew about healthy lifestyles but a range of other factors often led them to make unhealthy choices.
- Food choices and opportunities to engage in physical activity differed between rural, urban and peri-urban areas and were sometimes area of conflicts between adolescents and parents/caregivers.
- Interventions to improve adolescent diet and physical activity need to be context-specific and responsive to changing environments.

Background

The Transforming Adolescent LivEs Through NutriTion (TALENT) Consortium, established in 2018, comprises biomedical scientists (epidemiology, nutrition, laboratory science, intervention development), social scientists (psychology, sociology, social geography) and experts in policy and public engagement from the United Kingdom, four African countries (Cote d'Ivoire, Ethiopia, South Africa and The Gambia) and four locations in India (Dervan, Pune, Mumbai and Mysore) (Figure 1). TALENT includes eight sites (in five different low- and middle-income countries (LMICs)) at different stages of economic and nutrition transition. TALENT recruited participants from both rural (Dervan in India and Keneba in The Gambia), urban (Abidjan in Cote D'Ivoire, Mumbai in India, Mysore in India and Soweto in South Africa) and peri-urban (Jimma in Ethiopia and Pune in India) settings (Figure 1). TALENT aimed to share expertise and build capacity amongst biomedical researchers in qualitative research through train-

ing and mentorship and by leveraging local funding. A further aim was to provide new insights into ways to address the double burden of malnutrition amongst adolescents living in LMICs by affording opportunities for young people to discuss their own lived experiences and views of diet and physical activity.

Methodology

A series of stakeholder engagement sessions, survey data collection and focus groups was conducted to answer the following research questions:

1. What do young people and parents/caregivers think about diet, physical activity and health and how important are these to them?
2. What and who decides and shapes their eating and activity habits?
3. What might engage adolescents in changing their diet and physical activity?

The qualitative research was conducted by local researchers already embedded in each setting.

Focus groups were conducted with 480 adolescents and their parents/caregivers using creative techniques such as a photograph sorting activity where adolescents were invited to categorise different food types. The views of parents/caregivers were also sought as we considered these to be important in understanding the challenges and for developing solutions. In addition to the qualitative data collection, we collected small-scale contextual quantitative data from approximately 40 boys and 40 girls in each site (Fall et al, 2020). We used surveys to generate data on adolescent diet, body composition and socioeconomic status. Three systematic reviews were also conducted, including one qualitative evidence synthesis (Wrottesley et al, 2020; Jesson et al, 2020; Hardy-Johnson et al, 2021).

Main Findings

The qualitative research captured rich and nuanced data on adolescents' everyday lived experiences. It highlighted the complexity of diet and physical activity influences and demonstrated

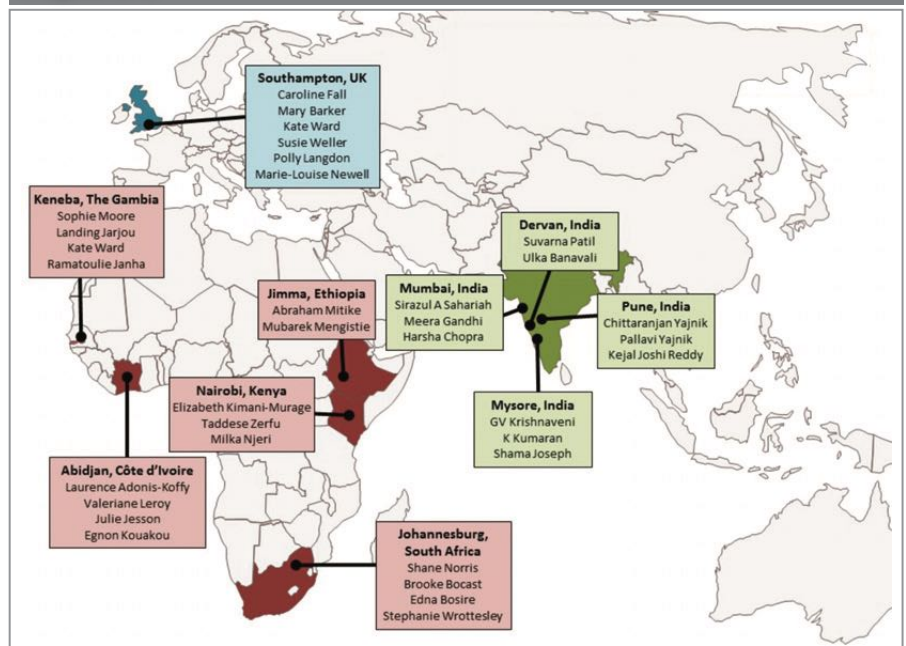
the importance of the broader contexts and processes that shape adolescent health in transitioning societies. A cross-site analysis of the pooled qualitative data (Weller et al, 2020) identified three themes

The first theme focused on *transitions in generational nutrition education and knowledge*. Adolescents, even in resource-poor settings, knew about healthy diets and lifestyles. They wanted to have energy, feel happy, look good and live longer but their desire for autonomy, a need to 'belong' in their peer group, plus vulnerability to marketing campaigns that exploited their aspirations, often led them to make unhealthy choices. Across all sites, participants displayed a good level of nutritional knowledge that was often underestimated by parents/caregivers who felt it was their job to educate their young people on such matters.

The second theme, *transition in caregiver-adolescent power balance*, described how adolescents and caregivers discussed power imbalances related to diet and physical activity. In the more urbanised settings, both adolescents and caregivers described the frequent negotiations and, in some instances, conflict that would occur regarding food options/choices and physical activity. For example, in Mumbai, caregivers expressed immense frustration that their children preferred 'outside' junk food to their home-cooked 'healthy' food. In contrast, adolescents felt constrained by their parents and expressed joy in the social element of eating outside food with their friends. In Indian sites such as Mysore, adolescents described pressure from adults to excel in exams which meant that academic studies often squeezed out physical activity time.

The final theme, *the implications of societal and economic transition for diet and physical activity*, depicts the differences between the rural and urban sites in relation to food choice and the opportunities to engage in physical activity. For example, urban adolescents in sites such as Soweto had easy access to calorie-dense, unhealthy foods bought outside the home whereas junk foods were only beginning to permeate rural sites such as Keneba. Across

Figure 1 TALENT collaborating sites



the sites, it was clear that rural and urban transition influenced the types of foods that were available, where those from more urbanised sites had more choice.

The data generated far exceeded expectations; 13 journal articles have been published on adolescent nutrition in LMICs. The added value produced from this relatively small award is a testament to the extraordinary collaboration we have established.

Next steps

Through TALENT, primary investigators and early career researchers have been trained in qualitative methods and now have experience in applying social science methodologies to the study of adolescent nutrition. The TALENT teams are keen to use these newly developed skills to develop interventions to improve adolescent nutrition which will need to be context-specific and responsive to transitions at the in-

dividual, economic and societal levels. Solutions need to acknowledge gender inequalities in different contexts and structural and cultural influences on diet and physical activity in resource-limited settings. Programmes need to be effective in engaging and reconciling the perspectives of adolescents and caregivers. Consequently, there is a need for action at both the community household level and through policy. In the next phase of work, the TALENT Consortium will use community engagement and participatory research techniques by employing groups of adolescents to develop and implement interventions to improve adolescent nutritional status.

Find out more information about TALENT through Twitter [@GCRF_TALENT](#) and [TALENT publications](#)

For more information about this article, please contact Polly Hardy-Johnson at phj@mrc.soton.ac.uk

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Capturing nutrition data for school-age children and adolescents

By Zakari Ali and Natasha Lelijveld

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Data gaps in school-age children (SAC) and adolescent nutrition and health are a key constraint to advancing advocacy and tracking progress globally. The exclusion of SAC and adolescents, or having them included in wide age ranges together with adults in routine surveys, represents a significant missed opportunity in obtaining SAC and adolescent-specific data (Ali et al, 2020).

“Without good data, we’re flying blind. If you can’t see it, you can’t solve it”

Kofi Annan (Former United Nations Secretary-General, 1997-2006)

However, there are recent and ongoing efforts to generate SAC and adolescent-specific age and sex-disaggregated data. Here, we summarise some of the major surveys, studies and databases that routinely collect or host data at national or regional levels on SAC and adolescent nutrition globally (Table 1). Below, we briefly discuss two

data platforms and two surveys that host and collect data on SAC and adolescents.

The Adolescent Data Hub (ADH): The ADH is one of the largest open-access data catalogues that aims to increase the accessibility of data on adolescents in low- and middle-income countries (LMIC). Users can search for datasets by country or region, sex, age (10-14 and 15-19 years of age), the type of data (longitudinal or cross-sectional) or by topic (White et al, 2020).

Global Burden of Diseases (GBD) database: The GBD database is hosted by the Institute for Health Metrics and Evaluation (IHME). It provides annually updated robust modelled data estimates for 333 health outcomes and 84 risks and determinants. The IHME’s GBD data was used for 12 headline indicators for adolescent health as defined by the Lancet 2016 commission on adolescent health and wellbeing (Azzopardi et al, 2019).

The Demographic and Health Survey (DHS) programme: During the last three decades, the DHS programme has supported the collection of 400 nationally representative surveys in over 90 LMIC.

While adolescents are not a specific target group of the DHS, adolescents are included in the 15-24 years of age category. Benedict et al (2018) pulled microdata (from 2000-2017) from 87 countries to summarise the nutrition of adolescent girls and boys 15-19 years of age. They estimated the prevalence of anaemia, iron supplementation and dietary diversity. Anthropometric data was reanalysed using World Health Organization (WHO) cut-offs as the DHS programme commonly uses adult body mass index (BMI) cut-offs for adolescents.¹

Global School-Based Student Health Survey (GSHS): The GSHS is a WHO initiative with the Centers for Disease Control and Prevention. GSHS is designed to assess the health and nutrition behaviours of school-going adolescents (13-17 years of age). The self-administered survey reports data on adolescent overweight and obesity using BMI-for-age cut-offs. Intake of carbonated soft drinks, food security and other indicators are also collected depending on the implementing country’s priorities and preferences.

These adolescent-specific data sources, in addition to the others outlined in Table 1, endeavour to make data available and in more user-friendly formats although they are only as good as the original surveys. Hence, data gaps in survey designs, such as the regular omission of SAC and adolescents, non-data disaggregation (by sex and age group) or including them in adult age groups, limit the utility of the data and estimates from most sources.

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¹ See research summary in this edition of Field Exchange entitled “Anthropometric assessment of nutritional status in school-age children and adolescents”

Table 1 Surveys and databases reporting school-age children and/or adolescent nutrition data

Name of survey (Organisation/ institution)	Coverage	Data collection period	Relevant adolescent nutrition data collected	Age range considered	Sex
Adolescent Data Hub (ADH)	138 LMIC	Continually updated database	Dietary intake, anthropometry, micronutrient status	10-19 years	Boys and girls
Demographic and Health Surveys (DHS)	90 LMIC	Every five years on average	Anthropometry, dietary intake, haemoglobin level	15-19 years	Girls (and sometimes boys)
Global School-Based Student Health Survey (GSHS)	97 countries	Non-specified	Dietary behaviours, anthropometry, hygiene	13-17 years	Boys and girls
Global Burden of Disease Database (IHME)	Global (204 countries and territories)	Periodically updated database	Iodine deficiency, vitamin A deficiency, dietary iron deficiency, protein energy malnutrition, other nutritional deficiencies	5-19 years	Boys and girls
Non-Communicable Disease Risk factor Collaboration (NCD-RisC) Database	200 countries and territories	Database updated annually	BMI	5-19 years	Boys and girls
Health Behaviour in School Age Children (HBSC)	50 countries (Europe & North America)	Every 4 years	Self-reported weight and height	11, 13 and 15 years	Boys and girls
Iodine Global Scorecard 2021–Iodine Global Network	194 WHO member states	Database updated annually	Median urinary iodine concentration (UIC)	5-19 years	Boys and girls
UNICEF Multiple Indicator Cluster Surveys (MICS)	118 LMIC	Every five years	Anthropometry, dietary intake, haemoglobin level	15-19 years	Girls (and sometimes boys)
Childhood Obesity Surveillance Initiative (COSI) – WHO European Region	Over 40 member states of the WHO European region	Every two years	Anthropometry, school food environment, physical activity, dietary behaviours	6.0-9.9 years	Boys and girls

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Anthropometric assessment of nutritional status in school-aged children and adolescents

By **Natasha Lelijveld**

Natasha Lelijveld is a senior nutritionist at ENN. She has previously worked in research at Malawi-Liverpool Wellcome Trust, the Hospital for Sick Kids in Toronto, the London School of Hygiene and Tropical Medicine and the No Wasted Lives initiative at Action Against Hunger.

Adolescents take part in a programme to improve nutritional status through iron and folic acid supplementation and the fortification of meals in Niger

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GLOBAL

What this article is about: This article discusses anthropometric assessment in school-aged children and adolescents.

Key messages:

- Despite some increase in the number of studies assessing nutritional status in school-aged children and adolescents in recent years, these age groups remain largely overlooked in international and national research, policies and guidelines.
- For anthropometric assessment, the range of different age categories, reference data and indicators used hinders the understanding of malnutrition in these age groups.
- More data and greater standardisation of anthropometric indicators would aid efforts to increase nutrition programming, policies and guidelines for school-aged children and adolescents.

Being under- or over-nourished during childhood and adolescence is associated with adverse consequences including the risk of infectious disease, poor pregnancy outcomes, lower educational attainment and the risk of earlier onset of non-communicable diseases (Black et al, 2008; WHO, 2016). Across all age groups, anthropometric status is used to estimate nutritional status and subsequent health risks. However, there is currently a lack of evidence, clarity and standardisation on assessing and classifying malnutrition in school-aged children and adolescents. This hampers advocacy efforts around the scale and burden of malnutrition in children older than five years of age and subsequent investments into research and interventions to tackle this challenge. The nutrition of children aged five to 19 years is regularly overlooked in international and national development priorities, policies and guidelines. There has been very little investment to date in improving the nutritional status of this age group, despite the nutritional sensitivity of this stage in life and

the potential for impact. There is also a lack of global and national nutrition targets identified for this age group and thus little motivation for assessing their nutritional status or for including them in national surveys.

In recent years, there have been positive strides to spotlight the importance of school-age and adolescent nutrition, including recog-

nitition in global initiatives such as The Lancet Commission on Adolescent Health and Well-being (Patton et al, 2016). In addition, the nutritional needs of adolescent girls are mentioned in the Sustainable Development Goals although the indicators are only for anaemia (Sachs, 2012; Ali et al, 2020). Large global datasets have also been recently utilised to summarise the prevalence of malnutrition in adolescents and anthropometric data has most comprehensively been reported in the papers summarised in Table 2. However, the age ranges used vary significantly in the reports and the reference data used to define thinness and overweight also varies, being either the World Health Organization (WHO) 2007 reference or the International Obesity Task Force (IOTF) reference, each with slightly different cut-off values (Table 1). Ambiguity and variations in how anthropometric status is defined is a major issue in understanding global and national prevalence rates, comparing rates across settings and understanding trends.

The Benedict et al paper (2018) was the first demographic and health survey (DHS) report to use adolescent-specific definitions of thinness

Table 1 Summary of references and cut-offs used for school-aged children and adolescents

	WHO 2007 growth reference	IOTF growth reference	CDC growth reference	WHO adult cut-off
Applicable age bracket	5-19 years	2-18 years	2-18 years	>18 years
Weight categories				
Thin or underweight	BAZ <-2	Equivalent to BMI<18.5 at 18 years	BAZ <5th percentile	BMI <18.5
Normal weight	BAZ -2 to +1	Equivalent to BMI 18.5 to <25 at 18 years	BAZ ≥5th percentile to <85th percentile	BMI 18.5 to <25
Overweight	BAZ >+1	Equivalent to BMI ≥25 at 18 years	BAZ ≥85th percentile	BMI ≥25
Obesity	BAZ >+2	BAZ >+2 Equivalent to BMI ≥30 at 18 years	BAZ ≥95th percentile	BMI ≥30

Abbreviations: BMI, body mass index (kg/m²); WHZ, weight-for-height z-score; WAZ, weight-for-age z-score; BAZ, BMI-for-age z-score; CDC, Centers for Disease Control; IOTF, International Obesity Task Force; WHO, World Health Organization.

² See research summary item in this edition of Field Exchange entitled "What's new in adolescent nutrition at The DHS Program"

and overweight (based on the WHO 2007 reference). Usually, DHS presents prevalence rates for 15 to 19-year-olds using adult thresholds i.e., body mass index (BMI) <18.5 for thinness and BMI >25 for overweight. This tends to greatly overestimate the prevalence of thinness and marginally underestimate the prevalence of overweight in adolescents. The WHO recommended definition for thinness, based on the 2007 reference, is BMI-for-age z-score <-2 and BMI-for-age $>+1$ for overweight. The WHO reference uses primary data from adolescents in the United States of America in the 1970s but is statically adapted to reflect more international norms based on the WHO 2006 reference for children under five years of age. The IOTF reference uses data on children from six countries to better align overweight and obesity estimates for children and adolescents with adult cut-offs. The threshold for thinness in this reference is aligned to adult BMI <18.5 and overweight is the equivalent to BMI ≥ 25 in adults. The IOTF reference results in a greater prevalence of thinness and a lower prevalence of overweight than the WHO reference. Often IOTF thinness data is presented as “Grade 1 thinness”; this is not the same as a BMI z-score <-1 but it is similar.

Another widespread issue in the literature is the interchangeable use of the terms, thinness and underweight, making it difficult to know whether BMI or weight-for-age have been utilised. The variations between different references and other issues associated with anthropometry, including the effect of the differential timing of the adolescent growth spurt and the impact of muscularity on the accuracy of the references, make anthropometric assessment of this age group especially complex. Several previous studies have discussed these issues in detail (Tumilowicz et al, 2019; Rolland-Cachera & ECO Group, 2011). In the recent papers highlighted in Table 1, the prevalence of overweight was generally higher in school-aged children and adolescent girls in low- and middle-income countries than in boys. It was highest in the Middle East, ranging from 15-34% across reports. For thinness, there was far less data and almost no data on boys. For girls, the highest prevalence was in South Asia, at approximately 23%. Trend data has found the prevalence of obesity has increased globally from 0.7% in 1975 to 5.6% in 2016 in girls and from 0.9% in 1975 to 7.8% in 2016 in boys. The prevalence of thinness decreased from 9.2% in 1975 to 8.4% in 2016 in girls and from 14.8% in 1975 to 12.4% in 2016 in boys (NCD Risk Factor Collaboration, 2017).

The increasing number of studies presenting prevalence data for malnutrition in the school-aged children and adolescent population is promising. However, the heterogeneity in age categories, reference data and indicators used hinders our understanding of the nutritional problems faced during this influential life period. More data and greater standardisation of anthropometric indicators would aid programmers and policymakers to monitor trends, design solutions and set national and global targets.

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Table 2 Summary of recent reports presenting prevalence rates of global adolescent anthropometric status

Author, date	Data used	Population and date of data	Thinness definition	Overweight definition	Reference used
Akseer et al, 2017	Global Burden of Disease (GBD) 2013 and WHO Data Repository, Global School-based Student Health Survey (GSHS)	10-24 years 186 countries 2009 to 2015	BMI-for-age Z <-2	BMI-for-age Z $>+1$	Not specified
Azzopardi et al, 2019	GBD – compiled secondary data	10-24 years 195 countries 2016	Not reported	BMI-for-age equivalent to BMI >25 at age 18 years (10-18 years) BMI ≥ 25 kg/m ² (19-24 years)	IOTF
Benedict et al, 2018	Demographic and health surveys (DHS)	15-19 years 87 LMICs 2000 to 2017	BMI-for-age Z <-2	BMI-for-age Z $>+1$	WHO 2007
Caleyachetty et al, 2018	GSHS and Health Behaviour in School-aged Children (HBSC) surveys	12-15 years 57 LMICs 2003 to 2013	BMI-for-age z <-2	BMI-for-age z $>+1$	WHO 2007
Spinelli et al, 2021	Childhood Obesity Surveillance Initiative (COSI)	6-10 years 36 European countries 2015 to 2017	BMI-for-age z <-2	BMI-for-age z $>+1$	WHO 2007
Ng et al, 2014	GBD, 2013 – compiled secondary data	5-19 years 188 countries 1980 to 2013	Not reported	BMI-for-age equivalent to BMI >25 at age 18 years (some self-reported anthropometry included)	IOTF
NCD Risk Factor Collaboration, 2017	Non-communicable Disease Risk Factor Collaboration (NCD-RisC) database and WHO STEPS surveys	5-19 years 200 countries 2016	BMI-for-age z <-2	BMI-for-age z $>+1$	WHO 2007

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Current evidence on anaemia and micronutrient supplementation strategies in school-age children and adolescents

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Background

Globally, one in four adolescents is affected by anaemia (Azzopardi et al, 2019). Asia contributes the highest number of cases, with approximately 194 million anaemic adolescents living in India and China (Wang et al, 2020). While the aetiology of anaemia in low- and middle-income countries (LMICs) is multi-faceted, including infection and chronic illness, the predominant causes during adolescence are iron and other micronutrient deficiencies. Iron deficiency and iron deficiency anaemia (IDA) contribute the majority of disability-adjusted life years (DALYs) associated with micronutrient deficiencies globally, with IDA being the leading cause of years lived with disability among children and adolescents (Das et al, 2018). Age-disaggregated data for school-aged children 5-9 years of age, younger adolescents (10-14 years of age) and older adolescents (15-19 years of age) is scarce. However, combined data for children and adolescents (0-19 years of age) shows that the prevalence of IDA is highest in Afghanistan (41%), followed by Yemen (39.8%) and Senegal (38.5%) (Global Burden of Disease Pediatrics Collaboration, 2016).

Children and adolescents are vulnerable to anaemia due to increased requirements for iron to support growth and development, particularly as they enter puberty. The risk of anaemia and/or iron deficiency is higher in adolescent girls than boys, particularly between 12-15 years of age, due to the elevated requirements for menstruation (Patton et al, 2016). Anaemia during childhood and adolescence increases the risk of infection and has adverse effects on growth and development, which may reduce school achievement and work productivity in later life (Shaban et al, 2020). As girls and young women reach child-bearing age, anaemia poses a threat to maternal and infant health, contributing to higher risks of morbidity and mortality, with potential long-term implications on the health and wellbeing of mothers and infants (Patton et al, 2016).

In addition to iron, deficiencies in other micronutrients often coexist in LMICs, although data on the burden of specific deficiencies in school-aged children and adolescents is sparse (Christian & Smith, 2018). Data that is available indicates that iodine deficiency affects 3% of girls 10-14 years of age and 5% of girls 15-19 years of age in countries with lower socio-demographic index (Christian & Smith, 2018). Vitamin A

deficiency is estimated to affect 20% of girls 10-14 years of age and 18% of girls 15-19 years of age in low socio-demographic index countries (Christian & Smith, 2018).

Current guidelines and recommendations

To date, research, policy and programming efforts for anaemia have focused on women of reproductive age (15-49 years), with an emphasis on reducing the prevalence of anaemia during pregnancy. However, the need to address anaemia earlier in the life-course (i.e., during the early adolescent years) has gained momentum. Current World Health Organization (WHO) guidelines (WHO, 2018) recommend weekly iron and folic acid (IFA) supplementation for all menstruating adolescent girls and adult women living in settings with an anaemia prevalence of 20% or higher, to improve their haemoglobin concentrations and iron status and reduce their risk of anaemia. For girls and women who live in settings where anaemia prevalence is 40% or higher, daily iron supplementation is recommended. However, these recommendations have not been enacted at a large scale in most LMICs and there is an urgent need to advance the implementation of micronutrient interventions among adolescents, with rigorous evaluation and deliberate plans for national scale-up. In addition, very few micronutrient intervention studies have been conducted on adolescent boys, hindering the development of evidence-based recommendations for this group.

The available evidence suggests that IFA supplementation is a crucial tool for anaemia prevention and treatment among adolescents and additional benefits may be noted with multiple micronutrient supplements (MMS). The recent Lancet Series on Maternal and Child Undernutrition Progress highlighted the strong evidence supporting MMS rather than IFA supplementation during the antenatal period and suggested a potential benefit of extending this to adolescent girls (Heidkamp et al, 2021). Alongside their current guidelines on IFA, the WHO calls for additional research to clarify the best formulation to provide multiple micronutrients on an intermittent basis to adolescents and women of reproductive age (WHO, 2011). However, very few studies have examined MMS among adolescents. The WHO recommends that countries have a national strategy for prevention and control of micronutrient malnutrition and the choice of intervention should

include consideration of costs, cost-effectiveness, feasibility and acceptability (WHO, 2016). However, in most LMICs sufficient information does not exist to allow governments to develop evidence-based national strategies to address multiple micronutrient deficiencies in adolescents.

Specific recommendations on anaemia prevention and supplementation for pre-adolescent school-aged children 5-9 years of age have not been established, since this age group is commonly categorised together with younger children in research and programming efforts, if at all. For example, for children 2-12 years of age, point-of-use fortification of foods with iron-containing micronutrient powders is recommended by the WHO in settings where childhood anaemia prevalence is 20% or higher. However, in practice, the anaemia prevalence in older children is often not known and the burden of anaemia is commonly estimated using prevalence figures for children under five years of age. Given these gaps in available data and recommendations, further research presented in this article will focus on adolescents 10-19 years of age, with the acknowledgement that greater attention on younger children is urgently needed.

Evidence comparing IFA and MMS in adolescents

As mentioned, IFA supplementation has been identified as a promising intervention to improve the health of adolescents in LMICs. Intermittent supplementation one, two or three times a week with IFA can reduce anaemia by approximately 35% in menstruating adolescent girls (Fernández-Gaxiola & De-Regil, 2019). Providing MMS, which include other vitamins and minerals in addition to IFA, may have additional benefits compared to IFA alone. A review of 5 trials found that MMS among non-pregnant and pregnant adolescents resulted in a significant improvement in serum haemoglobin concentration (Lassi et al, 2017). In anaemic girls in Bangladesh, long-term twice-weekly MMS with a doubled UNIM-MAP (UNICEF et al, 1999), led to greater improvements in haemoglobin concentration and in the status of vitamins A, B2 and C, when compared with IFA (Ahmed et al, 2010). In non-anaemic girls, twice weekly MMS was equivalent to IFA in improving haemoglobin levels and preventing iron deficiency, but had additional benefits in improving vitamins A, B2 and C status (Ahmed et al, 2012).

In many LMICs, there is a lack of systematic evidence to support rollout of national micronutrient interventions and no information on the most effective combination of micronutrients to provide to adolescents. Trials in LMICs comparing effects of MMS with IFA on health and education outcomes in adolescents are needed to clarify an optimal supplementation strategy, including the combination of micronutrients and dosage required. These studies are also needed to provide a basis for scale up of national micronutrient supplementation programmes and to provide governments with information on cost, feasibility, acceptability and best practices for implementing these programmes.

Examples of large-scale programmes

In a few LMICs, IFA supplementation programmes are being implemented to improve adolescent health. These programmes may be cost-effective given the economic losses due to IDA (Shekar et al, 2017). However, there is a need for additional studies to evaluate programmes and provide governments with guidance on how to implement programmes and maximize adherence. These programmes need to cater to adolescents who are in-school, as well as a substantial proportion of adolescents who are not enrolled in school.

A recent evaluation of the Girls' Iron-Folate Tablet Supplementation (GIFTS) Programme in Ghana found that school-based weekly IFA supplementation improved haemoglobin and reduced anaemia prevalence among girls 10-19 years of age in Ghana, although adherence was a challenge

(Gosdin et al, 2021). The GIFTS programme also provides supplementation to out-of-school adolescent girls through community health workers, but evaluations of this programme are limited (Yidana et al, 2020). A study of the GIFTS programme implementation in Karaga District, Ghana found that most IFA tablets were distributed in schools, with only 3% of pills distributed by health workers. The Indonesian government has also implemented a weekly school-based IFA supplementation programme for adolescent girls, yet coverage and adherence to this programme has been low. In the East Java and East Nusa Tenggara regions, only 10% and 31% of girls respectively reported receiving at least one tablet in the past six months and only 9% and 18% respectively reported consuming at least one of the received tablets (Alfiah et al, 2020). In 2012, the India Federal Ministry of Health and Family Welfare launched a national weekly IFA supplementation programme for in-school adolescent boys and girls and out-of-school adolescent girls. However, in a recent population-based survey in West Bengal, the majority of adolescents enrolled in the programme reported not receiving any tablets in the past month (62% of in-school girls, 73% of in-school boys and 97% of out-of-school girls). Only 9% of in-school girls, 7% of in-school boys and 2% of out-of-school girls reporting consuming four IFA tablets during the last month as intended by the programme (Sudfeld et al, 2020). Experiences from these existing programmes underscore the need for further research to guide programme implementation and improve coverage and adherence.

Next steps

In LMICs, national programmes to provide adolescents with micronutrients are crucial to set a trajectory for wellbeing throughout the life course. To inform these programmes, additional studies are urgently needed to clarify the optimal supplementation composition and delivery strategies, to address challenges with coverage and adherence and to guide programme implementation to maximize effectiveness. One example is the ongoing School-Based Assessment of Micronutrient Interventions in Adolescents (SAMIA) study, which is comparing weekly IFA with daily MMS on anaemia status, school performance/attendance and development outcomes among adolescents enrolled in secondary schools in Burkina Faso and Zanzibar, Tanzania. Findings from this study will clarify the optimal supplementation strategy (IFA alone vs. together with other essential nutrients) and provide evidence on feasibility, adherence and best practices to support scale up of national micronutrient supplementation programmes. These programmes are critical to improve nutrition among adolescents, which can lead to improvements in health and school performance, with life-long and intergenerational implications. Similar efforts are needed for school-aged children 5-9 years of age, starting with addressing the need for data on anaemia prevalence in this age group in order to inform specific recommendations on anaemia prevention and management, including the effectiveness of supplementation and other appropriate interventions for school-aged children.

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Determinants of adolescent nutritional status and practices in Burkina Faso: A pooled secondary analysis

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Adolescents share a meal with their family (their sisters accompanied by their infants). Lena, Burkina Faso

BURKINA FASO

What this article is about: This article applies pooled survey data to investigate the levels of malnutrition and associated dietary diversity in adolescents across different regions and socioeconomic strata within Burkina Faso.

Key messages:

- The study found suboptimal dietary diversity and a high consumption of processed and sugary foods. The strong association between dietary diversity and unhealthy food intake/consumption of added sugars in adolescents is an important consideration for policymakers to reduce the burden of double malnutrition in the country.
- Prevalence of severe malnutrition based on the World Health Organization mid-upper-arm circumference cut-off <16cm was high, especially among younger adolescents.

Introduction

Adolescence, from 10-19 years of age, is a period of rapid physical growth and significant psychosocial and cognitive development during which behaviours around food and physical activity are established. Consequently, adolescence is a critical period for establishing the future health trajectory of adolescents themselves and, in some cases, their children (ENN, 2021). Globally, many low- and middle-income countries are facing a double burden of malnutrition amongst adolescents linked to increased ultra-processed food consumption (Li et al, 2020).

Assessment of nutritional status among adolescents differs from that of children under five years of age and is less well defined globally. Adolescents represent 23.1% of the total population in Burkina Faso (World Health Organization Regional Office for Africa, 2018) and there is increasing interest from the Ministry of Health's Nutrition Division to better understand the nutrition status and practices of this group. This article analyses the available nutrition data for the adolescent age group using

surveys conducted in 2017 and 2018 in Burkina Faso in order to fill this data gap.

Available data

The study used pooled data from the Performance Monitoring and Accountability (PMA, 2020) nutrition surveys which were collected among women 10-49 years of age in Burkina Faso in 2017 (PMA2017/Burkina Faso-R4-HQFQ, 2017) and 2018 (PMA2018/Burkina Faso-R5-HQFQ, 2018). The final sample for all analyses included 2,432 non-pregnant adolescent girls. The PMA 2020 surveys used a multi-cluster design and mobile technology to support low-cost, rapid-turnaround, nationally representative surveys to monitor key health indicators in nine countries in Africa and Asia. The PMA2020 Nutrition Survey aimed to generate actionable data on nutrition interventions at the national level in Burkina Faso (PMA Data, n.d.).

It provided information on three nutritional outcomes:

1. Dietary diversity: Minimum dietary diversity was defined as having eaten at least five out of 10 food groups on

the previous day (grains, pulses, nuts and seeds, eggs, meat, green leafy vegetables, vitamin A-rich fruits and vegetables, other fruits, other vegetables and dairy).

2. Consumption of added sugars: Indicates whether the respondent had consumed any sugary foods (including jiggery, donuts, mandaazi, sweet biscuits, cake or candies) and/or sugary beverages (sweet fruit drinks, sweet tea, fizzy drinks or sugar-sweetened milk tea) on the previous day.
3. Mid-upper-arm circumference (MUAC) <16cm: A proxy indicator for assessing nutrition status where a cut-off of 16cm indicates severe malnutrition among adolescents as defined by the World Health Organization (WHO) Integrated Management of Adolescent and Adult Illness (IMAI) guidelines (WHO, 2011). This cut-off was used in the absence of normative WHO guidelines on anthropometric definitions for undernutrition in adolescents.

Independent variables were selected based on a literature review and data availability. They included place of residence, household wealth tertile, age group, ever attended school, living with elders, marital status, employment, household size and unhealthy food habits (yes if respondent had consumed fried and savoury snacks, sugary foods and/or sugary beverages the day before survey).

Households were asked about eight aspects of food insecurity in the past 12 months from the date of the survey including 'worry of not having enough food', quality, variety, frequency, quantity, availability, hunger level and not eating for an entire day. Household food insecurity was categorised as low/none if less than three aspects were true, moderate if four to six were true or severe if more than six were true. Regions were clustered to form six groups based on geography, feeding practices and cultural proximities (Figure 1).

Methods

We cross tabulated the outcomes with chi-square tests for selected characteristics to understand the distribution of outcomes in the study sample. In addition, we assessed logistic regression models with multiple variables using a stepwise procedure while screening for confounders. All analyses were conducted using Stata 15.1.

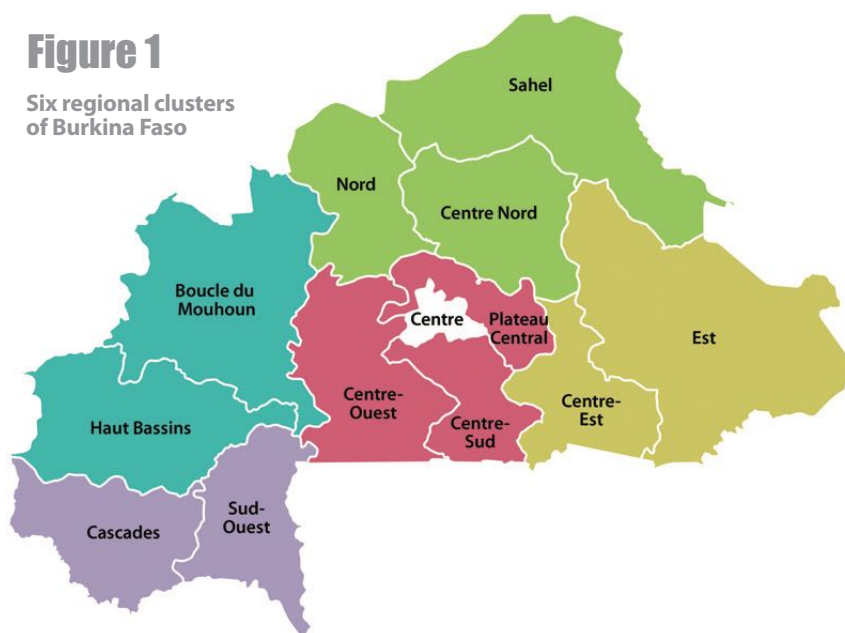
Results

Dietary diversity

Minimum dietary diversity was observed in 24.9% of the adolescents in Burkina Faso with dietary diversity differing by geography, especially between urban (35.3%) and rural areas (22.2%) (Table 1). Dietary diversity amongst adolescents was highest in the Centre region (43.5%) and lowest in the regional group of Sahel, Centre Nord and Nord (10.8%). Adolescents from the wealthiest households had higher dietary diversity (32.7%) than those with intermediate (22.1%) or poor (20.1%) household wealth. Dietary diversity was also higher amongst those who had consumed unhealthy food/drinks the previous day (38.1%) compared

Figure 1

Six regional clusters of Burkina Faso



to those who had not (16.4%). No significant difference was found by age group, attending school and household food security.

Compared to the reference group (Centre region), adolescents residing in the Sahel, Centre Nord or Nord cluster had 84% reduced odds of achieving minimum dietary diversity (OR 0.16) while those residing in the Est and Centre Est cluster had 71% reduced odds (OR 0.29) (Table 2). The probability of achieving minimum dietary diversity was almost three times higher for those who had an unhealthy food or drink during the previous day compared to the reference group of those who had not (OR 2.90).

Consumption of added sugars

A large proportion of adolescents (36.7%) reported consuming added sugars the previous day with the prevalence of added sugar consumption differing between regional clusters, especially between urban (50.7%) and rural areas (33.1%) (Table 1). The consumption of added sugars was highest in the Centre region (61.4%) and lowest in the Est and Centre Est cluster (18.2%). Adolescents from the wealthiest households had a higher consumption of

added sugars (49.2%) compared to those with intermediate (29.9%) or poor (31%) household wealth. Adolescents who achieved minimum dietary diversity reported higher added sugar consumption (56.5%) compared to those who did not (30.2%). The consumption of added sugars was lower among adolescents living with elders (41%) and among those living in larger households with eight or more family members (40.3%).

Compared to the reference group (Centre region), adolescents residing in the Est and Centre Est cluster had 74% reduced odds of added sugar consumption (OR 0.26). Those residing in the Centre Sud, Plateau Central and Centre Ouest cluster and those residing in the Cascades and Sud Ouest cluster had 71% reduced odds (OR 0.29) as compared to the Central region. The probability of added sugar consumption was almost three times higher for adolescents who had achieved minimum dietary diversity compared to those who did not (OR 2.92). Adolescents from the wealthiest households had 65% increased odds of added sugar consumption (OR 1.65) compared to the lowest income household group.



A school garden in Centre-Nord region of Burkina Faso

MUAC less than 16 cm

The prevalence of MUAC <16cm (a proxy for severe malnutrition) was estimated to be 15.7% among adolescents but was different across age groups (26.3% in the 10-14 years age group as compared to 2.1% in the 15-19 years age group). Differences in prevalence were noted by geography with higher prevalence in rural areas as compared to urban areas (16.7% and 11.6% respectively) and highest in the regional group of Est and Centre Est at 19.5%. Prevalence was lower in adolescents from wealthy households (11.9%) compared to middle-income house-

holds (15.8%) and poorer households (18.9%). Prevalence of MUAC <16cm was higher among adolescents living with elders, as well as adolescents who were not employed or had no cash earnings, or who were unmarried. Adolescents with higher diet diversity scores had a lower prevalence of MUAC <16cm (10.4% versus 17.4%). No significant difference was found by school attendance, household size, household food security and the consumption of unhealthy foods or drink the previous day.

Figure 2 shows that the total prevalence of unhealthy food intake was higher in urban

areas and significantly different by household wealth as compared to rural areas. The high prevalence of unhealthy food intake in urban areas may be as a result of greater access to these foods although different behaviours or cultural norms may also play a role. In rural areas, dietary diversity did not appear to vary much by household wealth. This was also the case for the consumption of unhealthy foods albeit the source (homemade, vendor/restaurant, processed) differed. In urban areas, the consumption of vendor and processed foods varied among the upper two wealth quintiles. Adolescents from the poorest households consumed mostly homemade unhealthy foods, those from the middle class mainly consumed unhealthy foods from a vendor or restaurant while those from the richest households tended to buy processed foods. These relationships require further investigation.

Discussion

Our findings show an association between high dietary diversity and added sugar consumption. This reflects findings in previous research and can potentially be explained by typical food habits in this age group (Moreno et al, 2010) as well as affordability (Zhang et al, 2019) and the accessibility of unhealthy foods (Stok et al, 2018).

The prevalence of severe malnutrition based on our MUAC definition was high, especially in the younger adolescents. The rate is very high compared to rates of severe malnutrition in children under five but, without standard definitions for adolescents, we are unable to know how this compares to other contexts. The fact that the prevalence of MUAC <16cm was found to be mostly restricted to the younger adolescents suggests that nutrition programmes for adolescents should be tailored to age.

Strategies to improve nutrition outcomes in adolescents

Reducing malnutrition and improving dietary quality among adolescents in Burkina Faso will require strategies and interventions to reduce the consumption of added sugars and other unhealthy foods, particularly in urban areas. The Determinants of Nutrition and Eating framework (Stok et al, 2018) outlines some strategies that have proven or have the potential to be effective:

- Increased taxation can reduce consumption and motivate healthier food choices. Several countries have implemented this strategy although with limited success (Haque et al, 2020).
- National policies to control the sale and marketing of unhealthy foods, curb aggressive advertisements and ensure strict monitoring and enforcement have also shown impact (Haque et al, 2020).
- Tailored health education and nutrition counselling to increase adolescents' awareness, particularly on 'hidden' ingredients and on the long-term adverse health effects of added sugars, can be an effective strategy (Haque et al, 2020).
- Similarly, national nutritional guidelines

Table 1 Prevalence of the three outcomes by various parameters

	Dietary Diversity		Sugary food intake		MUAC <16cm		
	%	No.	%	No.	%	No.	
Regional groups	***		**		*		
Total		24.9	2,432	36.7	2,432	15.7	2,420
Boucle-Du-Mouhoun, Hauts-Bassins		40.8	449	54.4	449	11.8	444
Sahel, Centre Nord, Nord		10.8	570	42.0	570	19.2	568
Est, Centre Est		14.6	493	18.2	493	19.5	492
Centre Sud, Plateau Central, Centre Ouest		26.3	355	23.1	355	13.3	355
Centre		43.5	343	61.4	343	11.8	340
Cascades, Sud Ouest		32.0	222	24.8	222	14.2	221
Age-group					***		
10-14 years		23.9	1,316	35.0	1,316	26.3	1,310
15-19 years		26.1	1,116	39.0	1,116	2.1	1,110
Place of residence	*		*		*		
Urban		35.3	992	50.7	992	11.6	988
Rural		22.2	1,440	33.1	1,440	16.7	1,432
Household Wealth Tertile	*		**		*		
Lowest tertile		20.1	748	31.0	748	18.9	743
Middle tertile		22.1	632	29.9	632	15.8	632
Highest tertile		32.7	1,052	49.2	1,052	11.9	1,045
Living with elders			*		***		
No		25.6	684	41.0	684	5.4	681
Yes		24.6	1,748	35.3	1,748	19.2	1,739
Ever attended school							
Never		23.2	723	36.9	723	14.9	715
Primary or higher		26.0	1,708	36.6	1,708	16.1	1,704
Household size			*				
<8 members		27.5	1,322	40.3	1,322	14.8	1,316
8 or more members		22.2	1,100	31.9	1,100	16.4	1,095
Employed with cash earnings					***		
No		24.2	2,240	36.2	2,240	16.4	2,231
Yes		34.1	192	44.8	192	4.7	189
Marital status					***		
Married		23.6	357	37.7	357	1.6	354
Unmarried		25.2	2,074	36.6	2,074	18.4	2,065
Household food security status							
Low to no food insecurity		27.9	1,314	38.9	1,314	13.7	1,310
Moderate food insecurity		25.0	671	34.0	671	16.7	666
Severe food insecurity		17.3	446	35.5	446	19.3	443
Unhealthy food/drink yesterday	***						
No		16.4	1,420	-	-	-	-
Yes		38.1	1,012	-	-	-	-
Dietary Diversity			***		**		
No		-	-	30.2	1,801	17.4	1,793
Yes		-	-	56.5	631	10.4	627

Chi square test: * p-value<.05 ** p-value<=.001 *** p-value<=.0001

Table 2 Results from multivariate models

	Minimum Dietary Diversity ¹		Consumption of added sugars ²	
	O.R.	95% C.I.	O.R.	95% C.I.
Regional groups				
Centre	1	Ref.	1	Ref.
Sahel, Centre Nord, Nord	0.16***	0.08 - 0.31	0.96	0.55 - 1.67
Est, Centre Est	0.29***	0.15 - 0.57	0.26**	0.11 - 0.62
Centre Sud, Plateau Central, Centre Ouest	0.59	0.25 - 1.39	0.29***	0.16 - 0.51
Boucle-Du-Mouhoun, Hauts-Bassins	0.56*	0.31 - 0.99	0.84	0.52 - 1.35
Cascades, Sud Ouest	0.76	0.34 - 1.71	0.29**	0.13 - 0.66
Unhealthy food/drink yesterday				
No	1	Ref.	-	-
Yes	2.90***	2.06 - 4.08	-	-
Dietary Diversity				
No	-	-	1	Ref.
Yes	-	-	2.92***	2.08 - 4.08
Household Wealth Tertile				
Lowest tertile	-	-	1	Ref.
Middle tertile	-	-	1.02	0.67 - 1.55
Highest tertile	-	-	1.65*	1.04 - 2.62
Goodness of fit (p-value)	0.95		0.20	

¹ Adjusted for regional groups and consumption of unhealthy food/drink

² Adjusted for regional groups, dietary diversity and household wealth tertile

and regulations on harmful ingredients have shown promise. Dietary recommendations should promote the adequate consumption of plant foods, low-fat dairy products, vegetable oils, nuts, poultry and fish and limit the consumption of red meat, sweets and sugary drinks.

- Limits on the sale of processed and sugary foods in school canteens and other environments have been effective to a lesser extent (von Philipsborn et al, 2019).

In summary, a multi-pronged approach is needed to address nutrition amongst adolescents in Burkina Faso.

The study has some limitations and the findings should be interpreted with caution. 1) Data availability constrained outcome selection and the parameters used in multivariate modelling. 2) Distribution of household wealth

was almost dissociated by area of residence with most of the poorest households in rural areas and vice versa (correlation: 0.62). 3) There was insufficient evidence that the multivariate model for dietary diversity was a good fit for the data. 4) Although MUAC has been used to define severe malnutrition, its effectiveness is still largely unknown. Lower MUAC measurements in younger adolescents may be due to differential growth spurts across the adolescent age spectrum that usually occur towards later adolescence. If true, there is a high probability of misclassification among the older age group of 15-19 years resulting in missing malnourished children. Nonetheless, the results provide useful insights.

Conclusion

This study provides an understanding of the nutritional health of adolescents in Burkina Faso

using recent national nutrition surveys. The study found suboptimal dietary diversity and a high consumption of processed and sugary foods. The prevalence of severe malnutrition based on the WHO MUAC cut-off <16 cm was high, especially among younger adolescents. The strong association between dietary diversity and unhealthy food intake/consumption of added sugars is an important consideration for policymakers to reduce the burden of double malnutrition in the country. Given that nutrition behaviours and habits are developed by early adolescence, designing nutrition interventions for school-age children should be promoted as a public health strategy. In addition, wherever possible, food systems should be regulated and national policies that tax unhealthy foods, regulate marketing and increase public awareness are needed.

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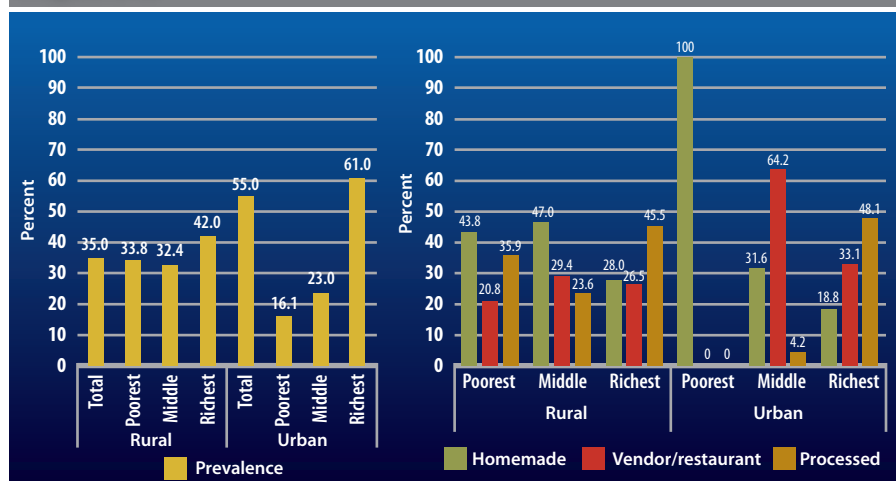
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Figure 2 Prevalence of unhealthy food and source of unhealthy food by household wealth and area of residence among adolescents, 2018



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Children having lunch at school in Tanzania



Diet and nutrition status among school-age children and adolescents in Tanzania

TANZANIA

What this article is about: This article features a cross-sectional survey of 68,147 children (5-19 years of age) in Tanzania between August and October 2019 to assess nutritional status and dietary quality using anthropometry and dietary recall methods.

Key messages:

- The findings suggest the co-existence of a triple burden of malnutrition in Tanzanian children: undernutrition, overnutrition and anaemia.
- Dietary quality was largely characterised by high intakes of cereals and grains, vegetables and legumes although the study group also had high intakes of fried foods, sweets and soft drinks. This may be responsible for the rise in overweight and obesity within the region.
- Robust, nationally-representative data for this age group has previously been unavailable in Tanzania, highlighting the importance of this analysis.

Background

More than 3,000 adolescents die every day, totalling 1.2 million deaths a year, largely from preventable causes (WHO, 2017). More than two-thirds of these deaths occur in low- and middle-income countries (LMICs) in Africa and South-East Asia (WHO, 2016). In sub-Saharan Africa, where 23% of the population is between 10 and 19 years of age, over 50% of adolescents attending school present with micronutrient deficiencies, such as anaemia, primarily due to food insecurity and limited food diversity (UNICEF, 2018). This period of adolescence is marked by significant physical and cognitive growth with broad implications on health throughout the life course. In LMICs, 500 million school days are estimated to be lost due to illness each year, contributing to significant school dropout rates and hindering the development of human capital for economic development (World Bank, 2018).

Hence, there is a focus on improving adolescent nutrition and health across sub-Saharan

Africa including in Tanzania (United Republic of Tanzania, 2016). However, the paucity of data affects programming and investments in adolescent nutrition, therefore threatening gains from investments in maternal and child nutrition (WHO, 2014). This article assesses the prevalence of the types of malnutrition and the association between diet quality and nutritional status, including anaemia, among school-aged children (SAC) and adolescents in Tanzania.

Methodology

A cross-sectional School Malaria and Nutrition Survey (SMNS) was conducted among SAC (5-9 years of age) and adolescents (10-19 years of age) in mainland Tanzania between August and October 2019. A total of 68,147 pupils from 661 selected public schools were interviewed using 24-hour dietary recall to understand what foods and beverages they had consumed over the previous 24 hours. Participants were asked to recall all the food and drinks consumed from the time they woke up in the morning to the time they went

Table 1 Relationships between participant characteristics and nutritional status

Background characteristic	Stunting (N= 68,016)			Underweight* (N= 23,860)			BMI-for-age (N= 67,767)				Anaemia (N= 23,167)			
	Stunting	No stunting	P-value	Underweight	No underweight	P-value	Overweight	Obesity	Thin	Normal	P-value	Anaemic	Non-anaemic	P-value
Sex														
Female	21.6	78.4	<0.001	10.7	89.3	<0.001	4.5	1.1	10.2	84.3	<0.001	32.4	67.6	0.246
Male	28.4	71.6		12.8	87.2		3.6	1.04	12.9	82.5		35.1	64.9	
Age groups (yrs.)														
5-9	12.2	87.8	<0.001				5.2	1.4	7.4	85.9	<0.001	33.1	66.9	<0.001
10-14	30.5	69.5					3.5	0.96	13.1	82.4		31.5	68.5	
15-19	45.8	54.2					1.7	0.26	20.2	77.9		56.6	43.4	
Residence														
Rural	27.2	72.8	<0.001	12.6	87.4	<0.001	3.0	0.7	12.5	83.8	<0.001	36.9	63.1	<0.001
Urban	19.1	80.9		9.7	90.3		6.6	1.9	8.9	82.5		25.6	74.4	
Malaria status														
Negative	18.5	66.6		8.7	86.2		4.25	1.2	11.5	83.1		30.1	69.9	<0.001
Positive	25.9	76.4	<0.001	16.7	88.6	0.000	2.5	0.4	11.5	85.5	<0.001	54.9	45.1	

Note: The table is based on school children and adolescents who were assessed for anthropometric indices. Each of the indices is expressed in standard deviation units (SD) from the median of the WHO Reference 2007 for 5-19 years to monitor the growth of school-age children and adolescents. The table is based on children with valid dates of birth (month and year) and valid measurements of both height and weight.

*Weight-for-age reference data is not available beyond age 10 because this indicator does not distinguish between height and body mass in an ageing period where many children are experiencing the pubertal growth spurt and may appear as having excess weight (by weight-for-age) when in fact they are just tall.

to sleep at night. To assess diet quality, the consumption of a variety of food groups at least once per week was assessed using the Diet Quality Score subscale.¹ Items included in the subscale were chosen from the study by Lazarou et al (2010) and the DONALD study (Feskanich, 2004). In addition, information on eating habits was collected as part of the dietary assessment.

Anthropometric measurements were collected using Seca weighing scales and ShorrBoard height boards. Measurements obtained (weight and height) were used to calculate z-scores which were used to classify individual children as stunted (height for age z-score (HAZ) <-2), based on the World Health Organization (WHO) reference population, or overweight if they had a body mass index (BMI)-for-age z-score (BAZ) >1, as obese with a BAZ >2, as thin with a BAZ <-2 and severely thin with a BAZ <-3.

Anaemia status was assessed in a randomly selected sub-sample of 33% of the enrolled pupils. Haemoglobin (Hb) concentration was measured using a drop of blood obtained via a finger prick and Hb concentration was assessed using a hemoglobinometer. Hb concentration was adjusted for altitude in specific localities and the severity of anaemia was defined based on WHO cut-off points (WHO 2011).²

Descriptive statistics, including percentage, mean and minimum/maximum values, were produced using STATA and presented in tables, maps and graphs. Since our endogenous variable – BMI – was a categorical variable with more than two possible categories (underweight, normal, overweight and obesity), a multinomial logistic regression was performed to assess the association between BMI and dietary quality, controlling for the following variables: sex, age and physical activity levels. To determine the association between diet quality and anaemia, a log binomial regression model with log link function was performed. A multivariable log binomial model was used to control for con-

founders. All analyses were two-sided and set at the 0.05 significance level.

Findings

A total of 68,147 SAC and adolescents were recruited. The majority were female (50.2%), 10-14 years of age (58.5%, mean age = 10.7 years) and from rural areas (72.4%).

Nutrition status

Table 1 describes the prevalence of stunting, underweight, thinness, overweight, obesity and anaemia among SAC and adolescents 5-19 years of age in mainland Tanzania. 25% (17,004) were stunted, 11% (7,454) were thin and 5% (3,388) were overweight or obese. 11.7% (2,792) of the pupils 5-9 years of age were underweight.

Stunting was found to be more prevalent in older children, affecting 45.8% of those 15-19 years of age. Stunting prevalence was higher among males than females (28.4% vs. 21.6%; p<0.001) and among children living in rural areas than urban areas (27.2% vs. 19.1%; p<0.001). The prevalence of underweight was significantly higher among males (12.8% vs. 10.7%; p<0.001), children from rural areas (12.6% vs. 9.7%; p<0.001) and those who tested positive for malaria when compared to those who tested negative (16.7% vs. 8.7%; p=0.000).

The prevalence of thinness (as defined by low BAZ) was higher among boys (12.9%) than girls (10.2%), among participants between 15-19 years of age (20.2%) and among participants from rural areas (12.5%) than those from urban areas (8.9%). The prevalence of overweight was higher in girls (4.5%) than boys (3.6%), in children from the lower age group (5-9 years of age) (5.2%) than from older age groups and from urban areas (6.6%) rather than rural areas (3.0%). More urban children were affected by obesity than those from rural areas (p<0.001).

The assessment of diet quality showed that the majority consumed cereals and grains (69.7%),

vegetables (32.2%) and legumes (29.6%) at least five times or more per week (Table 2). Whole fried food (10.3%), soft drinks (9.6%) and meat (6.4%) were consumed the least with comparatively smaller proportions of participants consuming these at least five times or more per week.

After adjusting for the effects of age, sex and level of physical activity, SAC and adolescents with medium (aRR: 0.91; p=0.043) and high diet quality (aRR: 0.89; p=0.016) had a 9% and 11% lower risk of overweight compared with those with low dietary quality respectively. Surprisingly, those with median and high dietary quality had a significantly lower risk of thinness. However, median and high dietary quality was not significantly associated with obesity (Table 3).

Anaemia

Overall, 33.9% (7,854) of SAC and adolescents who had Hb assessments were anaemic. When stratified by age, 33.1% of those 5-9 years of age, 31.5% of those 10-14 years of age and 56.6% of those 15-19 years of age had some degree of anaemia (Table 1). The prevalence of anaemia was >30% among both boys and girls as well as being higher in those from rural vs. urban areas and those with positive vs. negative malaria status.

The likelihood of being anaemic was positively associated with cereal consumption and inversely

¹ This subscale measures dietary quality or the frequency of the consumption of 11 types of foods and one cooking method. A four-point scale is used based on recommended nutritional items and frequencies. Response choices are never, once per week, two to four times per week and five or more times per week. Responses are weighted to reflect healthy or unhealthy frequencies with the potential score ranging between zero and 34. Higher scores indicate healthier dietary practices.

² Adolescents 15-19 years of age: any anaemia (girls: <12.0 g/dl, boys: <13.0 g/dl), mild anaemia (girls: <11.0-11.9 g/dl, boys: <11.0-12.9 g/dl), moderate anaemia (8.0-10.9 g/dl) and severe anaemia (<8.0 g/dl). SAC 5-9 years of age: any anaemia (<11.0 g/dl), mild anaemia (11.0-11.4 g/dl), moderate anaemia (8.0-10.9 g/dl) and severe anaemia (<8.0 g/dl).

Table 2 Frequency of the consumption of various foods and food groups among school-aged children and adolescents in Tanzania

Food groups	Never	Once per week	2 to 4 times per week	5 times or more per week
Cereals and grains	2,464 (3.6)	5,977 (8.8)	12,171 (17.9)	47,428 (69.7)
Roots	9,483 (13.9)	17,518 (25.7)	23,232 (34.1)	17,807 (26.2)
Fruits (whole, juice)	10,185 (15.0)	25,191 (37.0)	21,429 (31.5)	11,235 (16.5)
Vegetables	3,937 (5.8)	15,448 (22.7)	26,718 (39.3)	21,937 (32.2)
Legumes (beans, peas, nuts)	4,827 (7.1)	16,557 (24.3)	26,528 (39.0)	20,128 (29.6)
Milk	24,531 (36.1)	20,401 (30.0)	12,869 (18.9)	10,239 (15.0)
Fish, seafood	8,732 (16.5)	11,999 (22.6)	21,387 (40.4)	10,863 (20.5)
Meat	19,572 (28.8)	29,252 (43.0)	14,851 (21.8)	4,365 (6.4)
Salted, smoked meats	40,865 (60.1)	27,175 (39.9)	0	0
Sweets, junk food	26,343 (38.7)	21,259 (31.2)	13,359 (19.6)	7,079 (10.4)
Soft drinks	23,599 (34.7)	25,135 (36.9)	12,798 (18.8)	6,508 (9.6)
Fried food	22,442 (33.0)	22,216 (32.7)	16,374 (24.1)	7,008 (10.3)

Table 3 Association between BMI-for-age and diet quality among school-aged children and adolescents in Tanzania

BMI-for-age	cRR* (95%CI)	p-value	aRR** (95%CI)	p-value
Thinness				
Low DQS	1	.	1	
Medium DQS	1.09 (1.03,1.15)	0.004	1.09 (1.03,1.15)	0.005
High DQS	1.11 (1.04,1.17)	0.001	1.10 (1.04,1.17)	0.002
Overweight				
Low DQS	1	.	1	
Medium DQS	0.89 (0.82,0.98)	0.016	0.91 (0.83,1.00)	0.043
High DQS	0.85 (0.77,0.94)	0.001	0.89 (0.81,0.98)	0.016
Obese				
Low DQS	1	.	1	
Medium DQS	0.86 (0.72,1.02)	0.083	0.88 (0.74,1.05)	0.150
High DQS	0.87 (0.73,1.05)	0.139	0.93 (0.77,1.11)	0.414

*cRR = Crude Risk Ratio

**aRR = Adjusted Risk Ratio (Adjusted for age, sex and physical activity levels)

Table 4 Association between anaemia and the consumption of food groups among respondents (N= 23,167)

Consumption of food groups	cRR.(95%CI)	p-value	aRR.(95%CI)	p-value
Cereal				
Never	1		1	
1 to 2 times per week	1.01 (0.89, 1.1)	0.931	1.10 (0.93, 1.19)	0.403
3 to 5 times per week	1.19 (1.07, 1.3)	0.002	1.25 (1.11, 1.396)	<0.001
5+ times per week	1.13 (1.02, 1.3)	0.022	1.18 (1.06, 1.32)	0.002
Fruits				
Never	1		1	
1 to 2 times per week	0.94 (0.89, 0.99)	0.064	0.97 (0.92, 1.03)	0.288
3 to 5 times per week	0.90 (0.86, 0.95)	<0.001	0.95 (0.9, 1.0)	0.07
5+ times per week	0.88 (0.83, 0.94)	<0.001	0.97 (0.91, 1.04)	0.371
Vegetables				
Never	1		1	
1 to 2 times per week	0.97 (0.9, 1.05)	<0.001	0.98 (0.91, 1.06)	0.628
3 to 5 times per week	0.93 (0.86, 1.00)	<0.001	0.95 (0.88, 1.03)	0.206
5+ times per week	0.85 (0.79, 0.92)	<0.001	0.89 (0.82, 0.96)	0.004
Meat				
Never	1		1	
1 to 2 times per week	1.01 (0.89, 1.14)	0.931	0.94 (0.90, 0.98)	0.006
3 to 5 times per week	1.19 (1.07, 1.33)	0.002	0.90 (0.85, 0.94)	<0.001
5+ times per week	1.13 (1.02, 1.25)	0.022	0.90 (0.83, 0.98)	0.013

*cRR = Crude Risk Ratio

**aRR = Adjusted Risk Ratio (Adjusted for age, sex and physical activity levels)

associated with the consumption of vegetables (five+ times per week) and meat (at any frequency per week) (Table 4). Pupils who consumed cereals at least five or more times a week had an 18% higher risk of being anaemic compared to those who never ate cereals, while those who consumed vegetables or meat five or more times per week had a lower risk of being anaemic.

Geographic representation of the prevalence of malnutrition and anaemia

Maps illustrating the prevalence of stunting, anaemia and overweight according to the level of public health significance across all regions are presented in Figure 1.

Stunting was comparatively higher in the Njombe (43.3%), Kigoma (36.2%), Kagera (34.1%) and Rukwa (33.4%) regions; the lowest prevalence was recorded in the Dar es Salaam region (14.4%). Anaemia prevalence was highest among pupils in the Pwani region (53.3%) and lowest in the Iringa region (13.4%). Overweight prevalence was highest in the Lindi region (7.2%) followed by the Mbeya and Morogoro regions (both 6.8%).

Discussion and limitations

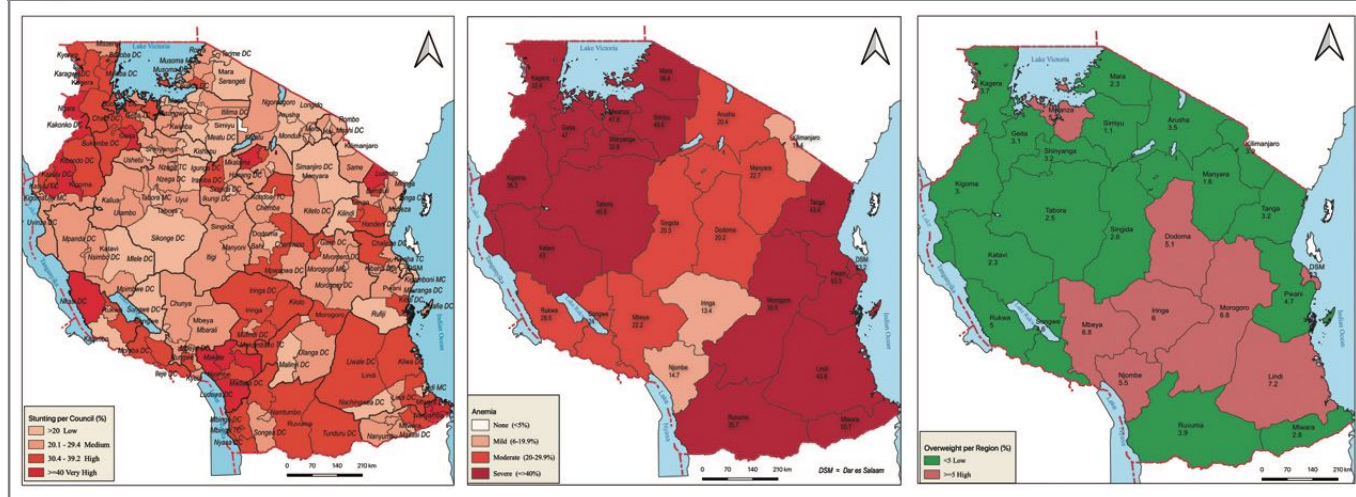
Robust nationally-representative data for SAC and adolescents (5-19 years of age) has not been available in Tanzania which has hindered the inclusion of nutrition in national policies, strategies, guidelines and plans for this vulnerable group. The nationally-representative data presented here provides the evidence required to support efforts to improve nutrition in this demographic in Tanzania.

The findings indicate the co-existence of undernutrition, overnutrition and anaemia in SAC and adolescents. We found that girls are less likely to be stunted than boys which aligns with existing evidence from the region (Bork, 2017). Sex differences in nutritional status, particularly stunting, are poorly understood – various potential drivers exist including poorer neonatal outcomes in males (Elsmén, 2004), preferential treatment among female children in some communities (Svedberg, 1990) and higher morbidity among male children (Green, 1992). Stunting prevalence was also lowest in the younger age groups. This could be partly explained by the increase in nutritional interventions and an improvement in the nutrition status of women over recent years, corresponding with a steady decline in stunting among the younger children in Tanzania. As demonstrated previously (Nicholaus et al, 2020), rates of overweight and obesity are increasing in the country with females being more at risk than males.

Dietary quality among SAC and adolescents was largely characterised by high intakes of cereals and grains, vegetables and legumes (beans, peas and nuts). Previous research has reported increasing consumption of high-calorie foods among SAC and adolescents especially in urban areas (Ochola and Masibo, 2014). The data presented here similarly demonstrates high intakes of fried food and sweets (junk food) and soft drinks. A similar study from Kenya reported that the majority of primary school children consumed sweetened beverages and junk foods, including chips, sweets, sausages, doughnuts and chocolate, in the seven days prior to assessment (Kigaru et al, 2015). The consumption of readily available, high-energy food items is a major contributing factor to the rise in overweight and obesity as well as noncommunicable diseases in Tanzania and the region. To tackle this, there is a need to promote healthy diets in schools and improve school health and nutrition environments. Efforts should include integrating nutrition into the school curriculum, creating school gardens to promote the consumption of vegetables and fruits and increasing the uptake of other nutrition-sensitive interventions such as water, sanitation and hygiene and deworming programmes.

Our survey showed that anaemia was common among SAC and adolescents in Tanzania with disparities across age

Figure 1 Prevalence of stunting, anaemia and overweight among school-aged children and adolescents 5-19 years according to the level of public health significance by region



groups, sex and geographical regions. The oldest age group reported an anaemia prevalence categorised as severe according to WHO guidelines, with the younger age groups categorised as moderate. Higher anaemia prevalence was also observed among children who tested positive for malaria, suggesting that malaria is contributing to the high levels of anaemia observed. Anaemia is associated with increased absenteeism, poor educational performance and increased school dropouts among SAC (Leslie et al, 1990). Weekly micronutrient supplementation may contribute to anaemia reduction and improved health outcomes and education performance among SAC and adolescents (WHO, 2018).

It is important to note the limitations of this analysis. The SMNS is a cross-sectional survey so data cannot be used to assess causality.

Dietary assessment methods did not account for seasonal variations and the list of food items included in the food frequency questionnaire was not exhaustive. As a result, it was not possible to establish consumption patterns based on a specific season or food item. The timing of the SMNS data collection varied by region therefore indicators affected by seasonality should be compared and interpreted with caution. In addition, the study used a dietary assessment tool that is not validated in developing countries.

Conclusion

The SMNS findings indicate the existence of the triple burden of malnutrition among SAC and adolescents in Tanzania, posing a growing health challenge. The identification, promotion and implementation of both nutrition-sensitive and nutrition-specific actions that simultaneously and

synergistically address undernutrition, overweight/obesity (and diet-related noncommunicable diseases) and micronutrient deficiencies in line with the Tanzania National Multisectoral Nutrition Action Plan provides an important opportunity to improve the nutrition and health status among this demographic. We recommend a joint multi-sector response towards the sustainable scale-up of a comprehensive nutrition programme with an intensified focus on making healthy diets accessible and affordable. We also recommend innovative approaches to address the built environment in and around schools and social and behaviour change communication approaches tailored to reach most children and adolescents through schools, as well as other community-based platforms.

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Risk of nutritional deficiencies increases during female adolescence: A comparison of the cost of a nutritious diet across sex and age

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Schools-based programmes are a good platform for teaching girls about their nutritional needs, Mali

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GLOBAL

What this article is about: Adolescent girls have increased nutrient needs that are not easy to afford in low-income countries. This analysis investigates how economic barriers may affect adolescent girls' food choices.

Key messages:

- Although the cost of a diet that meets only energy requirements is less for an adolescent girl than for an adult male, the cost of a diet that covers nutrient requirements is higher.
- For most countries, the cost share of a nutritious diet for an adolescent girl is the greatest among the members of the standard five-person household modelled in Fill the Nutrient gap analyses. On average, an adolescent girl contributed to 33% of the household's cost of a nutritious diet whereas an adult male contributed to 20%.
- The costs of nutrient adequate diets often peak around adolescence because adolescent girls require nutrient-dense foods to meet needs. In the contexts of Burundi and Timor Leste, even those foods that most cheaply cover nutrient needs are generally far more expensive than cereal staples.
- Functioning food systems are critical to ensure nutrient-dense foods are available and affordable. Programmes promoting food production and food security should be expanded to focus not only on cereal staples but also on comparatively cheap local sources of nutrients that provide both energy and a significant share of the micronutrients needed.

Introduction

Healthy diets that meet nutrient needs are critical across the lifecycle. Development stages, including that of puberty, increase the need for certain nutrients, placing individuals with poor physical or economic access to nutrient-dense foods at risk of nutrient deficiency (Bose et al, 2021). Studies have shown that the elevated nutrient needs related to the rate of growth and menstruation place adolescent girls at a heightened risk of anaemia and other nutrient deficiencies, making this group amongst the most nutritionally vulnerable (Christian & Smith, 2018). Major micronutrient deficiencies in adolescent girls, in countries where adolescent pregnancy is high, is an important risk factor for low birth weight and child stunting.

Adolescent girls have received increased attention within the nutrition sector in recent decades (Madjidian et al, 2018), specifically on understanding the societal factors affecting food access and cultural norms – which can favour males (Aurino, 2017) – as well as the unhealthy food choices observed among adolescents (Mistry and Puthussery, 2015).

Recent studies have shown that healthy foods are restricted by prohibitively high costs, particularly in low and low-middle income contexts (FAO, IFAD, UNICEF, WFP & WHO, 2020). Therefore, this analysis seeks to understand how economic barriers affect the food choices of adolescent girls.

Since 2015, the Fill the Nutrient Gap (FNG) analyses developed by the World

Food Programme (WFP) and partners have looked at the cost and affordability of meeting adolescent girls' nutrient needs relative to those of other household members to estimate the comparative risk of nutritional deficiencies. Using FNG results from 20 low- and middle-income countries, we assessed how much more economically challenging it is to meet nutrient needs as compared to energy needs for adolescent girls relative to other household members at different points in the lifecycle between pre-adolescence and adult life. We also compared two "case studies" to better understand what factors in the food environment drive the vulnerability of adolescent girls.

Methods

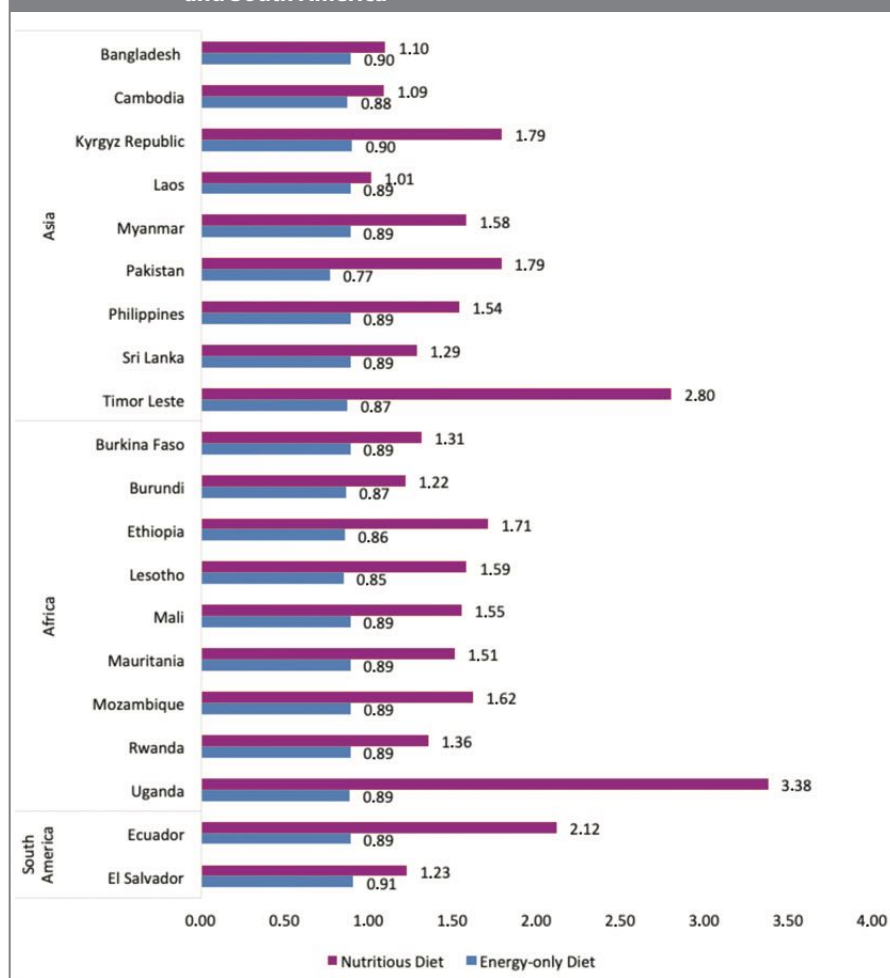
Methods used in the Fill the Nutrient Gap analysis

FNG analyses consist of a secondary data review and a calculation of the least cost energy-only diet and the least cost staple-adjusted¹ nutrient-adequate diet² ("nutritious diet") using Save the Children's Cost of the Diet optimisation tool (Deptford et al, 2017). Each FNG analysis engages stakeholders and informs decision-making for the prevention of malnutrition (Bose et al, 2019).

Each FNG analysis estimates the cost of the nutritious diet and the cost of the energy-only diet for individuals and is typically estimated at the sub-national level. Between 2015 and 2021, FNG analyses were carried out in 31 countries with 20 included in this paper.³ Data for estimating diet costs came directly from food prices collected in each context. Among the 20 FNG analyses included in this paper, eight use primary data collected specifically for FNG and 12 use secondary data (Consumer Price Index or household survey data). All national-level values are weighted averages calculated based on Cost of the Diet findings and population percentage for subnational levels. Household composition was standardised to allow for inter-country comparison and includes an adolescent girl, a moderately active adult male, a breastfed child aged 12-23 months, a child aged 6-7 years and a moderately active lactating adult woman aged 30-59 years old.

Using nationally aggregated cost estimates, we compared the cost of the energy-only diet and the cost of the nutritious diet between an adolescent girl and an adult male. Ratios for comparison between these two individuals were calculated by dividing the cost of the energy-only diet and nutritious diet for the adolescent girl by the cost of the same respective diets for the adult male. The ratio allows the assessment

Figure 1 Ratio of the cost for energy-only and nutritious diets between an adolescent girl and an adult man in 20 countries across Asia, Africa and South America



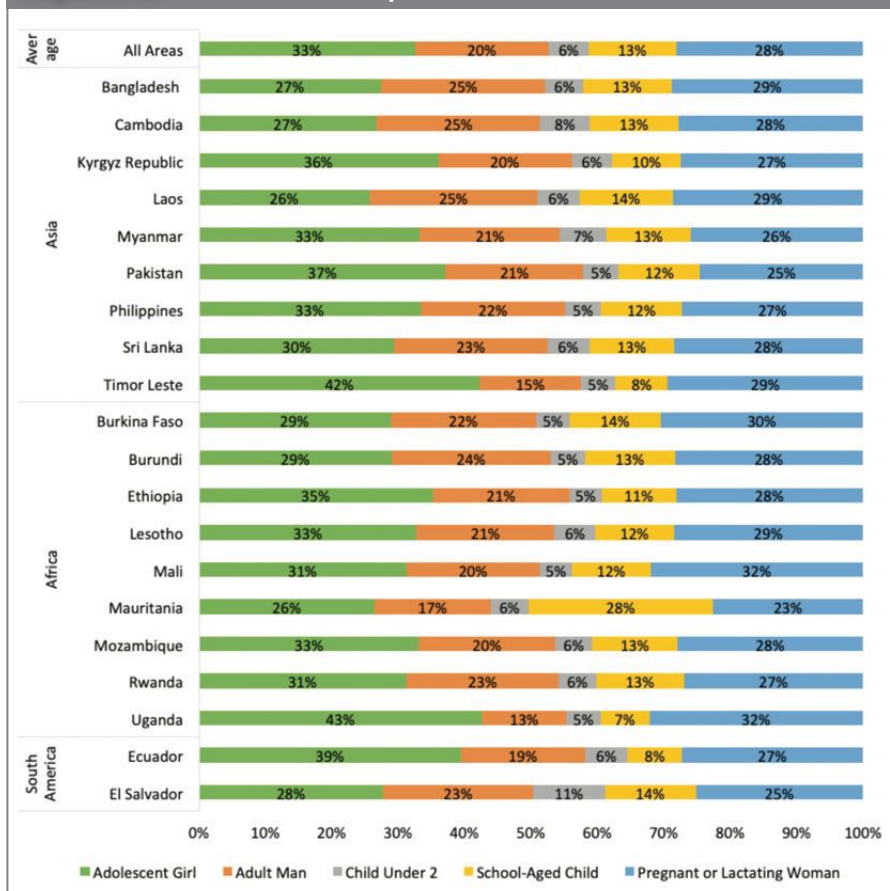
¹ The staple-adjusted nutrient-adequate diet includes quantities of local staple foods that cover roughly half of total energy needs. As the FNG has been carried out primarily in low- and low-middle income countries where staples continue to account for the majority of daily consumed food, staple adjustments are done in order to better align optimised diets to realistic consumption patterns.

² Energy, protein, fat, nine vitamins, four minerals.

³ 11 countries were excluded because findings on diet costs covered only part of the country or the cost of the energy-only diet had not been estimated which was the case for some of the earlier FNG analyses.

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Figure 2 Contribution to the cost of the nutritious diet by household members for a five-person household



of the relative cost of meeting needs between those two individuals.

Methods used for the case studies

We selected Timor Leste and Burundi as case studies as they had one of the highest and lowest nutritious diet ratios between the adolescent girl and the adult man respectively.

For these case studies, we looked at how the cost of the nutritious diet for a child 10-11 years old⁴ would compare to that of an adolescent girl aged 14-15 years and of a woman 30-59 years (non-pregnant, non-lactating) to assess how the cost of nutrient adequacy would change

across the life stages – from before until after adolescence.

For each country, we also extracted data to examine which three foods, identified in the least cost nutrient-adequate diet, contributed most significantly (in percentage terms of the recommended nutrient intake for each micronutrient) to coverage of adolescent girls’ needs for iron, calcium, zinc and folate, respectively. We included the weight of each selected food in the optimised nutritious diet and the percentage of the food weight that contributed to daily nutrient coverage. We then calculated the ratio of the price of one hundred calories of

each food to the price of one hundred calories of a representative basket of starchy staple food in each country, following the method recommended by Headey and Alderman (2019). Main local staple foods were identified based on available market data and customary local food practices; we compared the cost of these foods to these pre-identified staples in their dry, uncooked form. Lastly, across all the zones for which diet costs were calculated, we showed the range of the contribution of each food item to the overall cost of the nutritious diet.

Results

Comparison of diet costs between an adolescent girl and an adult male

Across the FNG analyses of these 20 countries, the cost ratio for the energy-only diet ranged between 0.77 and 0.91, meaning that the cost of a diet that met energy requirements was consistently less for the adolescent girl than for the adult male (Figure 1).

This pattern was reversed for the cost ratio for the nutritious diets which ranged from 1.01 to 3.38, meaning that the cost of a diet that covered nutrient requirements was consistently higher for the adolescent girl than for the adult male. The average of the ratio for countries included in this analysis was 1.63.

For most countries, the cost share of a nutritious diet for an adolescent girl was the greatest among the members of the standard five-person household modelled in FNG (Figure 2). On average, an adolescent girl contributed 33% of the household’s cost of a nutritious diet whereas an adult male contributed 20%.

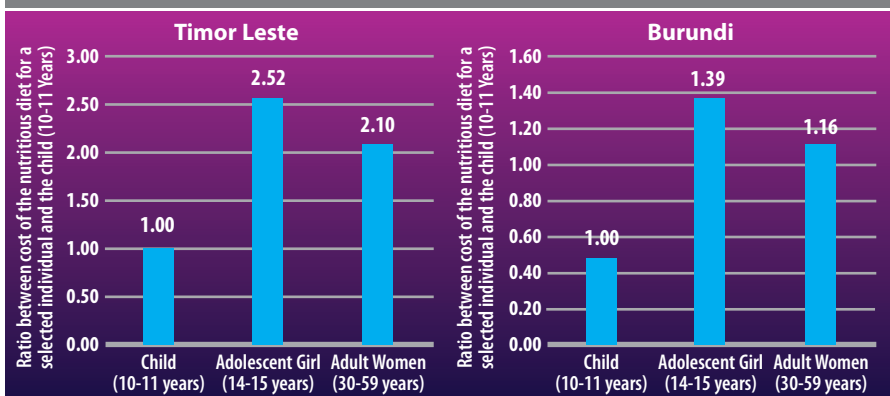
Evolution of cost of nutrient adequacy across the life stages from before until after adolescence in Timor Leste and Burundi

We estimated the lowest cost of a nutritious diet for three individuals: a child aged 10-11 years, a girl aged 14-15 years and a woman aged 30-59 years in Timor Leste and Burundi (Figure 3). The results presented are shown in proportion to the cost of the nutritious diet for a child aged 10-11 years. We found that, as a girl went from 10-11 years into adolescence, the cost of the nutrient adequate diet increased by 252% in Timor Leste and by 139% in Burundi. After adolescence, this cost decreased but was still higher than pre-adolescent costs in both countries.

Cost of top three micronutrient-rich food items in nutritious diets of adolescent girls in Timor Leste and Burundi

In both Timor Leste and Burundi, we examined to what extent the micronutrient content of each of the three main food sources in the optimised diet for an adolescent girl would contribute to

Figure 3 Ratios between the daily cost to access a nutritious diet for a child 10-11 years compared to an adolescent girl and an adult woman, in Timor Leste and Burundi



Note: In 2019 local currency, the cost of the nutritious diet for the child (10-11 years) was USD1.02 in Timor Leste and BIF723 in Burundi.

⁴ We selected a child aged 10-11 years not specifying sex as the nutrient requirements for male and female children are the same, assuming equal weights and activity levels, until puberty.

Table 1 Top three foods contributing to covering the micronutrient needs of an adolescent girl in Timor Leste and Burundi

	Food Item	MDD-W Food Group*	Grams Included in Daily Diet for the AG**	Contribution to coverage of nutrient needs in AG** (%)	Price Ratio between Food Item and Staple Food	Contribution of Food Item in the specified amount to overall cost of the nutritious diet across modelling zones (%)
Timor Leste						
Iron	Taro greens	Dark green leafy vegetables	693	34.7	3.10	14
	Dried meat (beef)	Meat, poultry and fish	99	33.7	26.9	34-51
	Leaf, cassava, raw	Dark green leafy vegetables	649	32.5	8.07	14-25
Calcium	Taro greens	Dark green leafy vegetables	693	82.1	3.1	14
	Leaf, cassava, raw	Dark green leafy vegetables	649	81.0	8.10	14-25
	Soy bean tofu	Pulses	184	11.4	6.3	7-12
Zinc	Dried meat (beef)	Meat, poultry and fish	99.0	33.4	26.9	34-5 ⁵
	White rice - imported	Cereals, roots, and tubers	359	29.0	1	7-17
	Leaf, cassava, raw	Dark green leafy vegetables	649	19.4	8.07	14-25
Folate	Taro greens	Dark green leafy vegetables	693	85.3	3.1	14
	Leaf, cassava, raw	Dark green leafy vegetables	649	85.0	8.07	14-25
	Chicken eggs	Eggs	111	7.10	18.4	24-27
Burundi						
Iron	Leaf, cassava, raw	Dark green leafy vegetables	576	51.0	2.46	6-27
	Leaf, amaranth, raw	Dark green leafy vegetables	132	13.2	3.70	3-19
	Cowpea, dried, raw	Pulses	107	12.8	1.01	15
Calcium	Leaf, amaranth, raw	Dark green leafy vegetables	576	60.8	2.46	6-27
	Leaf, amaranth, raw	Dark green leafy vegetables	132	19.1	3.70	3-19
	Fish, small, dried, fresh water	Meat, poultry and fish	14.7	9.7	22.27	5-32
Zinc	Cowpea, dried, raw	Pulses	107	27.6	1.01	15
	Leaf, cassava, raw	Dark green leafy vegetables	576	25.8	2.46	6-27
	Soybean, flour, raw	Pulses	84.9	21.1	1.16	15
Folate	Leaf, cassava, raw	Dark green leafy vegetables	576	39.8	2.46	6-17
	Cowpea, dried, raw	Pulses	107	23.7	1.01	15
	Bean, kidney, dried, raw	Pulses	94.4	19.4	0.907	2-10

* MDD-W: Minimum diet diversity for women; ** AG: adolescent girl

Note: The sum of the percentages may add up to over 100% by case study and micronutrient as not all modelling areas included the same foods in the optimised nutritious diet, i.e., one kind of green leafy vegetable covered over a third of iron needs in one of the modelling zones while a different type of leafy green vegetable covered over a third of iron needs in another modelling zone

covering her micronutrient needs. Table 1 shows the price ratio between the caloric price of each food compared to the caloric price of staples.

In Timor Leste, the optimised diet included comparatively more low-calorie, high-nutrient density foods such as dried beef meat and leaves than in Burundi.

For Timor Leste, the caloric costs of non-staple foods that most cheaply covered iron, calcium, zinc, and folate were between 3 to 27 times more expensive per 100 calories than the standard staple (rice). Animal-source foods in Timor Leste were particularly expensive; dried beef and eggs were included in the optimised diet for iron and folate coverage respectively and, despite being included in portions of roughly 100g (around 7% of the diet's weight⁵), accounted for between a quarter to half of the total cost.

In Burundi, adolescent girls' nutrient needs were covered by foods containing both energy and micronutrients at comparatively low prices. Beans and pulses cost only slightly more per calorie than the staples (cassava and maize) therefore allowing for relatively inexpensive coverage of iron, zinc and folate.

Caloric price ratios for green leafy vegetables were less in Burundi than in Timor Leste. As in Timor Leste, animal-source foods (dried fish) had a high caloric price ratio; however, in Timor Leste, animal-source foods were identified as the lowest cost options for coverage of three of the four micronutrients analysed while in Burundi only dried fish was selected for calcium coverage.

Discussion

When only considering their energy needs, we found the diet of an adolescent girl costs less than that of an adult man because an adolescent girl has lower energy needs. However, we found that the least-cost nutritious diet for the adolescent girl was, on average, 1.63 times more costly than that of an adult man. Because adolescent girls have higher absolute needs for protein, calcium, iron and zinc, they require more foods that are nutrient-dense, i.e., foods that contribute to filling nutrient gaps without providing much energy.

Nutrient needs change along the lifecycle, as does the cost of nutrient adequacy, leaving adolescent girls among the most vulnerable members within a household. The costs of nutrient-dense foods vary, specifically with regard to their content of iron, calcium, zinc and

protein. These foods can often be expensive particularly when they are animal-source foods. The case studies of Timor Leste and Burundi showed that differences in how sharply the cost of a nutritious diet increased as a female child became an adolescent was determined by the types and cost of foods that were the most cost-efficient source of these nutrients.

In Timor Leste, for which we estimated one of the highest ratios between the cost of a nutritious diet for an adolescent girl and that of an adult male (2.80), the relative caloric price of nutritious foods was high and households had to spend considerable resources to access animal-source foods and vegetables to meet their nutrient needs. In Burundi, where the ratio between the cost of the nutritious diet for an adolescent girl and that of an adult male was one of the lowest (1.22), nutrient-dense foods did not cost much more than foods that were mainly good sources of energy. In particular, pulses were a good source of both energy and specific nutrients (e.g., iron, zinc, folate and calcium) and leafy vegetables were nutrient-dense and relatively cheap. The differences

⁵ The total daily weight of foods included in the diets for Timor Leste for the AG ranged between 1342g and 1658g.

Food markets with a diverse selection of fresh nutritious foods, like this one in Bangladesh, help support adolescent girls' access to nutrients



identified between Timor Leste and Burundi point to characteristics of the food environment such as good sources of different nutrients and their relative cost compared to staples.

The differences identified between the food environments of Timor Leste and Burundi did not translate into differences in the affordability of diets nor of nutrition outcomes. In Burundi, for example, although beans are available and inexpensive, low income and high poverty keep household food expenditure levels low; it can therefore not be assumed that households can afford to include beans in their diets. FNG analyses estimated that both Timor Leste and Burundi had a high percentage of households that would not be able to afford the nutritious diet (77% and 70%, respectively) and national surveys find high rates of stunting in children under five (46% and 56% respectively) (GDS, 2018; MPBGP, 2017).

In most low- and middle-income settings, the political, developmental and agricultural policies of the past several decades have been oriented primarily towards the production of

staple foods to ensure adequate food supply (Pingali, 2015) rather than nutritious foods (OECD, 2021). Programmes promoting food production and food security should be expanded to focus not only on cereal staples but also on comparatively cheap local sources of nutrients like beans which, as can be seen in the Burundi example, provide both energy and a significant share of the micronutrients needed to cover nutrient needs.

To meet the needs of an adolescent girl, households must be able to purchase and/or produce an adequate quantity of nutritious foods. Across the FNG analysis included in this paper, 39% to 76% of households could not afford a nutrient-adequate diet in low-income countries and 11% to 78% in low-middle income countries. If the household cannot afford the lowest-cost nutritious diet, the needs of those with the highest costs of the nutritious diets – such as adolescent girls – are most likely not met. Interventions that focus on social protection, that support income-generation or strengthen livelihoods with diversification of food production

and the transformation or preservation of nutritious foods can help to reduce the barriers to accessing nutritious diets.

Efforts to add micronutrients to the diets of vulnerable groups, including adolescent girls, need to be increased. Fortification and bio-fortification of staples and commonly consumed foods and condiments, such as fish sauce, bouillon cubes and salt, can inexpensively provide nutrients for the general population (WHO & FAO, 2006). Adolescent girls, whether they are pregnant or not, can also benefit from iron and folic acid or multiple-micronutrient supplementation (Engle-Stone et al, 2019).

Conclusion

The costs of nutrient-adequate diets based on real food prices offer insights into how food systems promote or hinder access to nutritious diets. Evidence on the high cost of nutritious diets for adolescent girls can highlight the economic obstacles faced by this vulnerable group and can serve as a powerful advocacy tool to prioritise the inclusion of adolescent girls' needs in food and nutrition policies. Access to inexpensive, micronutrient dense commodities within a food system decreases the comparative vulnerability of adolescent girls and other groups with higher needs as compared to less nutritionally vulnerable members in the household.

It is therefore imperative that multi-sector coordination between the education, gender equality, agriculture and infrastructure and social protection sectors is in place to ensure that: (1) healthy nutritious foods are available at costs that benefit both producers and consumers, (2) households are economically empowered to purchase nutritious foods, (3) cultural behaviours ensure that the most nutritionally vulnerable, e.g., adolescent girls, receive foods that meet their needs and (4) interventions such as supplementation and fortification are considered to increase the availability and intake of micronutrients and prevent malnutrition.

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Early is best but it is not always too late. Young Lives evidence on nutrition and growth in Ethiopia, India, Peru and Vietnam

Benny L, Boyden J & Penny M (2018) *Early is best but it's not always too late: Evidence from the Young Lives study in Ethiopia, India, Peru and Vietnam, Summative Report.*

Younglives.org.uk

<https://www.younglives.org.uk/content/early-best-its-not-always-too-late-young-lives-evidence-nutrition-and-growth-ethiopia-india>



A mother feeds her children in Ethiopia

© FAO/IFAD/WFP/Michael Tevelde

ETHIOPIA, INDIA, PERU & VIETNAM

What this article is about: Anthropometric data, taken from 12,000 children across the Young Lives cohort, was analysed to determine the impact of malnutrition and the key determinants of child growth.

Key messages:

- The Young Lives data supports the hypothesis of 'growth plasticity', where malnutrition within the first 1,000 days of life is not necessarily irreversible.
- The risk of stunting was highly influenced by household income and housing conditions as well as by the health and education levels of mothers.
- While changes in dietary patterns contributed to healthier growth for some children, it also increased the risk of overweight and obesity due to the higher consumption of total energy, sugar and saturated fat.

Background

Despite substantial gains in child wellbeing in low- and middle-income countries, poor health and nutrition remain significant challenges to children's survival, growth and development. Both stunting and wasting in early childhood, particularly during the first 1,000 days (from conception until the child's second birthday), are associated with poor physical growth, neurological development, cognitive functioning and progression in school. The impacts can also extend through generations when undernourished adolescent girls and young women become mothers. The possibility that early linear growth deficits can be recovered in later childhood and adolescence has been widely debated.

As a contribution to monitoring and policy guidance for the Millennium Development Goals, and now the Sustainable Development Goals, the Young Lives study explores the determinants and outcomes of childhood poverty and inequality in Ethiopia, India, Peru and Vietnam. This report summarises the extensive body of evidence from the Young Lives study regarding the factors that threaten children's growth and development as well as which children are most susceptible and at what point in their lives.

Methods

Young Lives is a longitudinal study co-ordinated by the University of Oxford in partnership with national research and policy institutions. Since 2002, Young Lives has followed the progress of 12,000 children in 80 poor communities across Ethiopia, India, Peru and Vietnam. At the outset, children were included from two age groups: 4,000 born in 1994 (the Older Cohort) and 8,000 born in 2001 (the Younger Cohort). Data collection has occurred at approximately three-year intervals, taking anthropometric measurements and interviewing children and adolescents, as well as their caregivers, to develop detailed profiles of their households and communities.

Findings

The extent of malnutrition

In the Older Cohort, the prevalence of stunting at eight years of age was 31% in Ethiopia, 33% in India, 28% in Peru and 29% in Vietnam. By 15 years of age, the prevalence of stunting had increased in India to 36% but reduced in Ethiopia (29%), Peru (26%) and Vietnam (24%). For the Younger Cohort, the prevalence of stunting increased from 21% to 27% in Ethiopia between the ages of eight and 15 years but decreased in India (29-28%), Peru (20-16%) and Vietnam (20-12%). At all ages, the prevalence of stunting

was lower in the Younger Cohort who were 15 years of age in 2016 compared to the Older Cohort who were 15 years of age in 2009.

While those in the Younger Cohort were at a lower risk of being undernourished, they were at greater risk of developing overweight and obesity in later childhood and adolescence. Specifically, at 15 years of age, the prevalence of overweight and obesity was higher in the Younger Cohort compared to the Older Cohort in India (6.5% vs. 3.8%), Peru (25.7% vs. 20.1%) and Vietnam (8.9% vs. 3.2%).

Key determinants of child growth

Across the countries included in the Young Lives study, the risk of stunting was highly influenced by household income and housing conditions as well as by the health and education levels of mothers and, to a lesser extent, other household members. In all countries, children and adolescents living in rural areas were more likely to be stunted.

Between 2009 and 2016, improvements in economic conditions were associated with increased food security and dietary diversity. In India, Peru and Vietnam, the Younger Cohort also consumed more animal-source foods during this period. While changes in dietary patterns contributed to healthier growth for some children, it also increased the risk of overweight and obesity due to the higher consumption of total energy, sugar and saturated fat.

Exposure to extreme weather, famine and violent conflict has adverse effects on children's growth, either directly or indirectly, if livelihood and food supplies are disrupted.

Overall, boys were at a greater risk of malnutrition than girls due to a combination of genetic, biological, economic and sociocultural factors, particularly in the younger years. However, in India, gender bias contributed to reduced stunting prevalence in older boys who were likely to consume more diverse diets than adolescent girls.

Principles for policy and programming

The Young Lives study has provided detailed evidence of the key influences on child nutrition and growth. These findings have informed six overall priority areas for policy and intervention:

- **Investing throughout childhood**
It is well established that early life is the most sensitive period and should be prioritised for investments in healthy child nutrition and growth. However, Young Lives showed that there may be gains from sustaining investment through adolescence. Measures to improve later nutrition not only consolidate early growth and prevent faltering but also help those children who were initially stunted to recover.
- **Providing robust social protection**
Social protection mechanisms, including cash transfers, food supplementation (including school feeding) and health coverage, can help to prevent malnutrition and may compensate, at least partially, for stunting.

- **Improving water, sanitation and hygiene services**
Young Lives research confirms that children's healthy growth depends on effective water, sanitation and hygiene services. Measures to achieve this can include composting toilets, septic tanks or different types of pit latrines in the shorter term, with piped sewer systems being prioritised in the longer term.
- **Supporting girls and mothers**
Since mothers' health is so important to children's health, measures that target women's nutritional status, such as investing in nutrition during adolescence, have the potential for positive benefits in the next generation.
- **Responding to global concerns over climate change.**
Climate change poses a significant risk to nutrition for children and adolescents. The global response should include measures to reduce the extent of climate change

while helping countries to adapt to climate change.

- **Using research to support evidence-based policy**

The Young Lives study identified multi-country evidence for recovery from growth faltering after infancy. However, gaps remain in our understanding of adolescent growth recovery, what its implications are and how it may be brought about. Progressive policies targeting the early adolescent period may contribute to improvements in nutrition across the life-course.

Conclusion

It used to be thought that deficits in linear growth during the first 1,000 days of life were irreversible. The Young Lives data supports the hypothesis of 'growth plasticity' in older children, even up to 15 years of age. This suggests that investments in nutrition during the later years of childhood and early adolescence may contribute to improved growth, development and health outcomes in current and future generations.

Growth through Nutrition: The adolescent nutrition SBCC programme in Ethiopia



Save the Children (2019). *Documenting Research on the USAID Growth through Nutrition Activity Adolescent Nutrition SBCC Program: Outcomes and Lessons Learned*. Available from: <https://www.advancingnutrition.org/resources/adolescent-resource-bank/documentation-research-usaid-growth-through-nutrition-activity>

The Adolescent Nutrition Social Behavioural Change Communication (SBCC) Program is just one component of Growth through Nutrition, a multi-sector nutrition project in Ethiopia, initiated in 2019 in 20 woredas (districts) in Tigray, Amhara, Oromia and Southern Nations, Nationalities and Peoples Region (SNNPR). The Adolescent Nutrition SBCC Program currently uses pre-tested, nutrition awareness-raising,¹ nutrition knowledge² and skills-building³ SBCC materials in school-based clubs and other community platforms where adolescents and their families are reached. In addition, adolescent nutrition education radio spots are broadcast

in classrooms. The 'star food' concept was introduced across SBCC materials; the concept supports communication about priority nutrient-rich foods to improve dietary diversity.

This report details the early, rapid assessment of the Adolescent Nutrition SBCC Program to identify strengths, weaknesses and opportunities for improvements. The study consisted of 11 focus group discussions (FGD) with primary, secondary and out-of-school adolescents, 16 individual and small group interviews with mothers and fathers, in- and out-of-school adolescents, nutrition programme facilitators, educational radio personnel, regional SBCC managers and one direct observation. One woreda from each intervention region was chosen; these were randomly selected from Amhara, Oromia and SNNPR. Neadir Adet woreda from Tigray was purposefully chosen as it contains both food secure and food insecure areas.

The assessment found schoolteachers had been trained in all four regions. In SNNPR and Tigray, SBCC managers were also training education officers and health staff while in SNNPR, Amhara and Oromia SBCC managers were training out-of-school programme facilitators. Trained teachers had introduced adolescent nutrition activities into existing gender or health clubs or

had created nutrition clubs. Adolescents reported high satisfaction with these clubs and felt the information provided had been previously lacking. They appreciated being able to borrow materials such as games. However, not all adolescents were provided with other materials such as leaflets to take home due to fear of shortages.

Overall, the Adolescent Nutrition SBCC materials appear to be well-received, understood and used with regions tailoring activities to suit their context. Almost all FGD participants said they had shared the nutrition information gained from the clubs with their parents. Adolescents and parents also reported changes in behaviours such as adding a vegetable or protein to breakfast. Topics such as dietary diversity seemed to be well assimilated. However, some topic areas such as nutrition during menstruation and gender were much less mentioned by adolescents, suggesting a need for a greater emphasis on these topics moving forward. The role of radio was yet to be optimised as none of the primary school students had heard a nutrition radio spot and radio staff expressed the need for a mechanism to assess and maximise listenership. Valid concerns exist about the need for further evidence of a change in nutritional and nutrition-sensitive practices, sustaining interest in improving adolescent nutrition and the ability of the programme to help adolescents and families to overcome resource-related impediments to good nutrition. Several opportunities exist for the programme to begin to address these issues and to improve in other areas moving forward.

¹ Materials include girls' "Bright Minds, Bright Futures" poster and "Five Household Doable Actions for Girls and Boys" poster.

² Materials include the "Nutrition Practices Card Game", the "Best Nutrition Secrets to Share" Conversation Leaflet for girls and the "Nutrition Hookworms and Ladders" Game.

³ Materials include the Menu Planning game and the Earn and Buy game.



A mother in her vegetable garden, SNNPR, Ethiopia

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Fix my food: Children's views on transforming food systems

By Catherine Fleming (Western Sydney University) and Deepika Sharma (UNICEF)



Fleming C, Chandra S, Hockey K, Lala G, Munn L, Sharma D & Third A (2021) *Fix my food: children's views on transforming food systems*. Sydney: Western Sydney University: <https://doi.org/10.26183/6qhg-xn49>

GLOBAL

What this article is about: This report presents findings on youth insights, perspectives and lived experiences of food systems. Qualitative data was collected via participatory workshops with children and adolescents from 18 countries and was complemented by quantitative data collected using the United Nations Food Systems Summit (UNFSS) U-Report poll.

Key messages:

- Children and adolescents described availability and access to healthy foods as key weaknesses within food systems.
- Youth were concerned about the link between poor food quality and environmental degradation, water pollution, chemical fertilizers and unhygienic markets.
- Recommended actions to improve global food systems should focus on: 1) improving the availability, accessibility and affordability of nutritious foods; and 2) reducing the impact of food systems on environmental degradation and climate change.

Background

Poor diet quality is driving malnutrition among adolescents globally (Aguayo & Morris, 2020). Many adolescents are unable to access the diverse and quality diets necessary for them to grow and thrive. Globally, as few as one quarter of adolescents (10-19 years) in low-income countries consume enough fruit and vegetables (Kupka et al 2020). At the same time, in the same settings, adolescents often readily access cheap, nutrient-poor foods (Aguayo & Morris, 2020).

Additionally, climate change is exerting unprecedented and devastating pressure on food systems, which will only worsen if not stopped. Sustainable food systems are critical to ensuring that all children and adolescents can access nutritious, safe, affordable and sustainable foods

(Fox & Timmer, 2020). However, current food systems are failing children and adolescents.

Methods

In 2021, UNICEF partnered with the Young and Resilient Research Centre at Western Sydney University to conduct participatory workshops with children and adolescents in 18 countries around the world. Over 700 children and adolescents 10-19 years of age from diverse backgrounds participated in workshops to document their insights, perspectives and lived experiences of food systems. UNICEF also gathered information using the United Nations Food Systems Summit (UNFSS) U-Report poll, a quantitative poll launched from the U-Report global and country-specific platform with 22,561 respondents 14-24 years of age.

Key Findings

Workshop findings clearly highlighted that for children and adolescents, food is life, growth, development and health, but also joy and happiness. When it comes to food choices, taste, smell, "healthiness" and affordability drive their food choices. Peer influence also plays an important role, with U-Report data indicating that 37% of children commonly consume unhealthy foods when meeting with friends.

Across participating countries some children and adolescents could choose the food they eat but most children and adolescents could not. Children and adolescents discussed having knowledge about the nutritious foods they would like to eat but availability and cost of such foods were prohibitive. In U-Report polls 39% of children and youth reported that they do not have access to healthy foods, which they believe is due to distance from farming areas, food distribution problems, low stocks in markets, disruption to food production, food seasonality and natural disasters.

Children and adolescents are concerned about the link between poor food quality and environmental degradation. Another predominant concern for children and adolescents is the poor quality of food due to water pollution, chemical fertilizers and unhygienic markets.

Recommendations

Children and adolescents see an urgent need to transform food systems and to reduce their negative impact on people and the environment. Their recommendations pivot around two broad themes: 1) actions to transform food systems and improve the availability, accessibility and affordability of nutritious foods; and 2) actions to reduce the impact of food systems on environmental degradation and climate change.

Conclusion

In the workshops, children and adolescents were bold in raising their voices and demanding change. Children and adolescents called on political leaders and public and private-sector stakeholders to work across all levels of society to strengthen food systems; from implementing effective regulation of food industries to promoting individual and community behaviour change. This is not an easy mission. Yet the health, nourishment and flourishing of future generations depend on it.

The Fix my Food report was launched virtually in September 2021, during which authors presented the key findings and discussed these with a panel of youth representatives from across the globe.

The recording of the virtual launch event is available at: <https://vimeo.com/616824363>

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Box 1 Recommendations from children to improve food systems

More specifically, the report highlights five key recommendations that children have put forward to transform global and national food systems:

EDUCATE

Educate children, families, educators, farmers, leaders and decision-makers about nutritious and safe foods, good nutrition, food systems, climate change, recycling and sustainable development.

ENGAGE

Listen to children, organise youth forums, elect youth representatives and use online tools to connect children and young people into debates and action to transform their food systems.

REGULATE

Enforce policies to ensure food quality, safety and security; regulate food prices; safeguard children from harmful food marketing practices; control the use of chemicals and preservatives; promote natural, organic and minimally-processed foods; and penalise and disincentivise companies that produce, package or distribute food in environmentally-destructive ways.

INVEST

Invest in sustainable foods for all children by securing access to nutritious, safe, affordable and sustainable food and safe drinking water; improving food waste management; incentivising local production of nutritious foods and support the rights and practices of indigenous peoples; enhancing food facilities (e.g. markets) and infrastructure (e.g. roads); and supporting social safety nets – food, vouchers or cash – that ensure access to nutritious foods for children living in poverty.

REDUCE

Reduce the impact of food systems on the environment by empowering communities to grow their own produce and learn more about sustainability; reducing plastics over-use, deforestation and environmentally destructive methods of food production; promoting and supporting sustainable farming as a vocation for young people through education, investments and financial incentives; and favouring local food production and accessible farms and markets (i.e. "from far away to being close") to secure enough local, affordable and nutritious food for all children and their families.

Scoping review on school food and nutrition policies

World Health Organization (2021). *Assessing the existing evidence base on school food and nutrition policies: a scoping review*. Geneva. WHO. License: CC BY-NC-SA 3.0 IGO.

The prevalence of overweight, obesity and diet-related noncommunicable diseases among children and adolescents is rising globally. Furthermore, the prevalence of wasting and stunting rates remains high in many low-income settings. The school setting provides an environment in which the health of children and that of the wider school community can be protected and promoted, making school food and nutrition policies a critical area when tackling malnutrition. However, there has been a notable weakening in school health and nutrition programming over the past decade. In response, the World Health Organization (WHO) is currently developing school food and nutrition policy guidelines.

This report presents the results of a scoping review conducted in 2019 to support the development of the WHO guidelines on school food and nutrition policies. The review identifies and maps existing evidence on the effects of school food and nutrition policies on health-related outcomes in children of school age. Policies and interventions were mapped in terms of their impacts on the following policy areas: school community, the school curriculum, the school food and nutrition environment and school nutrition and health services. The report does not discuss the effectiveness of the different policies and programmes.

A total of 69 reviews (67 systematic reviews and two protocols) were included in this scoping review. Of these, 66 assessed the effects of school-based policies or interventions and three assessed the factors influencing the implementation of interventions. In total, five systematic reviews specifically assessed food and nutrition policies. Of the 66 effectiveness reviews, the majority reported on primary and secondary school-aged children (n=20/66) or pre-school, primary and secondary school-aged children (n=17/66). Many primary studies included multi-component interventions, for example interventions that addressed the school curriculum and community. Overall, reviews that assessed the impact of policies or interventions on the school curriculum were most common (n=48/66) followed by reviews that assessed the impact of policies or interventions on the school food and nutrition environment (n=39/66), the school community (n=22/66) and school nutrition and health services (n=10/66). Interventions included many different activities including nutrition education, gardening, food procurement policies and the provision of food in schools. Nutrition policy options, including food and nutrient standards and pricing policies, were the subject of only a handful of reviews. Questions related to obesity and overweight dominated the evidence base; there were no reviews that assessed underweight, stunting or wasting. The most reported outcomes were anthropometric and diet-related.

The scoping review also identified key gaps in the existing evidence base. Going forward, there is a need for longer-term follow-up studies, more studies in lower-income countries, greater inclusion of theoretical models to support the implementation of interventions, more studies that make comparisons between interventions with and without parental participation as well as across socio-economic divides, the extension of outcomes of interest beyond the physical outcomes - to include cognitive and academic outcomes as well as environmental determinants - and more studies that assess the cost-effectiveness and sustainability of the interventions. Based on the findings of this scoping review, the WHO has commissioned a new systematic review to underpin its upcoming recommendations on school food and nutrition policies.



Save the Children International (2021) *Investing in the now and the future*. [Savethechildren.net](https://www.savethechildren.net).

<https://resourcecentre.savethechildren.net/document/investing-now-and-future/>

Save the Children UK and Scaling Up Nutrition (SUN) Youth Leaders recently released a brief making the case for prioritising adolescent health and nutrition and setting out recommendations for governments to implement a gender-transformative, adolescent-responsive approach to health and nutrition. The brief provides model commitments for advocates, governments and donors and calls for governments to increase their commitment to invest in gender- and adolescent-responsive, integrated health and nutrition services. This global brief was created in recognition of the multiple commitment-making moments in 2021 and beyond (including the Nutrition for Growth Year of Action, the Global Financing Facility Replenishment Event, the UN Food Systems and Lives in the Balance Summits, Family Planning 2030 and the Generation Equality Summit) and the opportunity these moments present to further adolescent health and nutrition. The brief also aims to equip national advocates and youth leaders with an interest in adolescent health and nutrition with a clear briefing explaining why this issue is important and what needs to be done.

Key content and recommendations

The brief provides a summary of the challenges that adolescents face in gaining access to health and nutrition services and maintaining their health, nutrition and economic wellbeing – these barriers include stigma and discrimination, dependence on support from others and adolescents falling between the services designed for children and those designed for adults. It highlights the increasing deprioritisation and reduced investment in adolescent health and nutrition in this critical period when adolescents face increasing health risks and gender inequities further exacerbated by the COVID-19 pandemic. It uses programme evidence and experience from SUN Youth Leaders to demonstrate barriers and opportunities for adolescents

Investing in the now and the future: Why governments should commit to adolescent health and nutrition

in nutrition and health and provides an evidence-informed resource demonstrating the links between gender equity, girls' empowerment and health and nutrition.

The brief calls for adolescent-responsive health and nutrition systems and gender-transformative approaches. An adolescent-responsive approach is a systems approach that integrates adolescent services into each building block of the health and nutrition system and adapts policies, procedures and programmes to respond to the unique and diverse needs and preferences of adolescents. Gender-transformative approaches attempt to promote gender equality by (i) fostering a critical examination of inequalities and gender roles, norms and dynamics, (2) recognising and strengthening positive norms that support equality and an enabling environment, (3) promoting the relative position of women, girls and marginalised groups and transforming the underlying social structures, policies and broadly held social norms that perpetuate and legitimise gender inequalities. The brief identifies the core components of adolescent-responsive and gender-transformative minimum services. These include (i) how systems can specifically support adolescents, (ii) specific measures to improve nutrition, including through community entry points, (iii) how information environments can promote stigma-free access to services and (iv) measures to address and transform gender inequalities in health and nutrition outcomes.

Finally, the brief sets out nine model commitments that governments can make to deliver on adolescents' right to health and nutrition amongst others, emphasising the importance of a multi-sector, integrated approach that adopts adolescent responsive health management information systems, partners with adolescents and youth at all levels of policy and programming and allocates increased domestic resources to strengthen health and nutrition systems and to improve the quality of care for adolescents everywhere.

When are we going to teach health?

Van Dusen, DP (2020) *When Are We Going to Teach Health? Chapter 9: "Celebrating Nutrition: Involving Everyone Is Free and Fun"*. Lioncrest Publishing. Available at <http://www.teachhealth.org>

Commentary by Duncan Van Dusen and Amonje Moses Oluchiri

Duncan Van Dusen has a Master's degree in Public Health, is Chief Executive Officer and founder of CATCH Global Foundation and the author of Amazon number one bestseller, "When Are We Going to Teach Health?"

Amonje Moses Oluchiri is the Founder and Executive Director of the Kenyan non-governmental organisation, Wellness for Greatness.



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GLOBAL

What this article is about: This article provides an extract from "When Are We Going to Teach Health?" that describes the CATCH Whole Child school wellness programme and provides a commentary on implementing youth nutrition education programming in low- and middle-income countries with a focus on Kenya.

Introduction

Coordinated Approach to Child Health (CATCH) empowers school communities to cultivate lasting 'Whole Child' health by ensuring universal access to proven, equitable and fun teaching resources. The CATCH Whole Child school wellness programmes include nutrition education, physical activity and physical education, vaping avoidance and mental health programmes. The nutrition education programme is built on three pillars:

1. Acquiring easily remembered knowledge on nutrition knowledge principles (Box 1).
2. Empowering children with positive attitudes and beliefs about choosing healthy foods.
3. Reinforcing those beliefs socially through a supportive, celebratory environment and adult role-modelling.

Pillar 1: GO-SLOW-WHOA labels to promote nutrition knowledge principles

To help simplify and memorably communicate the nutrition knowledge principles (Box 1), CATCH uses the labels GO, SLOW and WHOA to categorise foods by their relative nutritional value. Children as young as four years old can quickly learn to categorise foods accordingly with the goal of eating more GO foods than SLOW foods and more SLOW foods than WHOA foods. Because it is about choices, not absolutes, this system reduces perfectionism about food selection (there are no NO foods) and avoids shaming children about eating small amounts of less-nutritious foods on a limited basis.

Pillar 2: Empowering positive attitudes about nutrition

Effective child nutrition programmes are not just about what is on the menu. How healthy foods are promoted drives not just what kids put into their mouths but also how they feel about it. These attitudes and beliefs affect the nutritional choices they make outside of school and in the future.

There are many ways to condition children's attitudes about food and all of these are essentially

free. For example, research has demonstrated that fun and empowering names for healthy foods e.g., "night-vision carrots" increases young children's willingness to taste, consume and enjoy them (Musher-Eizenman et al, 2011).

What is even better is child-created messaging. If students make the signs and invent the food names, they develop a sense of ownership and reinforce health principles in their own minds. At all ages, the best way to learn is to teach and the best way to believe is to advocate.

Another activity that children enjoy and that fosters positive attitudes towards nutrition is creating a school garden. Children love the whole process, especially harvesting the bounty, creating an entirely different experience around eating fruit and vegetables.

Pillar 3: Social and environmental support

In developing strategies for creating a culture of optimal health, it is essential to remember that health is social. So, we need to mobilise everyone we can in the school environment, including often overlooked cafeteria workers. Educators can also communicate the importance of health by showing up to eat with children, talking to them about healthy food choices and creating fun celebrations of health. Schools often struggle to get parents involved but find that a health-themed event is one of the best ways to engage them.

Such events introduce families to the health-behaviour modelling and health-vocabulary building their children receive at school which they can then reinforce outside the classroom. The emotional high of being active together strengthens community bonds long after the school lights have been turned off.

All schools should be part of nutrition education and all school staff part of teaching health. Effective health education is not something one teacher does in one classroom. Creating a healthy school community requires including everyone in community-wide practices and celebrations, all of which can be achieved at little to no cost.

Commentary: Implementing pillars of youth nutrition education in low- and middle-income countries

Our collaborative work in Kenya has led us to several learnings about youth nutrition education in developing countries.

Youth vulnerability in the transition to "western diet"

Firstly, countries such as Kenya have dramatically shifted from seasonal, mostly plant-based, fibre-rich dishes toward energy-dense diets high in refined starches, sugar, fats, salt, processed foods, meat and other animal-source products. Consumers, particularly in metropolitan areas, increasingly rely on supermarkets, fast food outlets, street food vendors and takeaway restaurants as they spend less time making meals at home.

Youth are uniquely vulnerable to these changes because they lack the knowledge and skills of traditional food preparation and are easy targets for packaged food marketers who portray their products as modern and cool. Meanwhile, adults who did not grow up with the temptations of the "western pattern diet"¹ are unable to condition their children about its dangers.

GO-SLOW-WHOA nutrition principles are not a rigid dietary list so they can easily be applied to local traditions and food variety. This framework helps youth to adjust their eating habits to restrict the intake of highly processed foods and foods that have elevated levels of fat, sugar and/or salt.

Box 1 Nutrition knowledge principles

1. Minimising the intake of foods and beverages with extensive processing and added salt and sugar.
2. Favouring plant-based foods such as whole grains, fruits and vegetables because they contain antioxidants, immunity-boosting phytochemicals and fibre.
3. Controlling portion size.

¹ The 'Western Pattern Diet' is a modern dietary pattern that is characterised by high intakes of animal products and ultra-processed foods, often resulting in a high-fat, high-sugar, low-fibre diet.

Importance of national governments

In many developing countries, national governments can play an important role in youth nutrition education by investing in school food access and nutrition and developing policies surrounding food marketing, labelling and advertising targeting children. In Kenya, the government has recently created a competency-based curriculum (CBC) and revived the 4K clubs in schools (Box 2).

Combine preservation of cultural and food traditions

The preservation of cultural heritage and the promotion of healthy plant-based foods can be combined through social activities during traditional holidays and festivals. Food festivals can support schools and the community through local sourcing and the preparation of food while

also providing social support for healthy behaviours. In Kenya, we showcase the rich traditional cuisine including fruits, vegetables, legumes (e.g., lentils, beans), nuts, seeds and whole grains.

Conclusion

Many principles of promoting healthy food choices among youth are universal, including providing simple and memorable models for understanding nutrition, empowering positive attitudes and beliefs and creating a reinforcing social environment. Many low- and middle-income countries such as Kenya battle the double burden of malnutrition and the rising prevalence of noncommunicable disease and are working urgently to promote healthier diets and meet population food needs in an environmentally sustainable manner. Schools and governments must prioritise investing in knowledge, skills and social support for youth as a major part of these efforts.

Box 2 CBC and 4K clubs

- The CBC outlines national learning standards for all subjects and includes requirements for physical activity, nutrition and hygiene and sufficient time in the schedule to teach them.
- The 4K clubs in schools seek to create awareness and develop a positive mindset towards agriculture among youth.
- The 4K clubs align with the CBC by connecting the development of skills and knowledge to the application of those competencies.

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A briefing session on COVID-19 before classes start in Bangladesh

Nutrition and health challenges for Rohingya and Bangladeshi adolescents and the impacts of the COVID-19 pandemic

This is a summary of the following two reports:

- 1) Guglielmi, S, Jones, N, Muz, J, Baird, S, Mitu, K and Ala Uddin, M (2020) 'We didn't come here to eat. We came here to save our life': Health and nutrition challenges facing adolescents in Cox's Bazar, Bangladesh.' *Policy Brief. London: Gender and Adolescence: Global Evidence.*
- 2) Guglielmi, S, Seager, J, Mitu, K, Baird, S and Jones, N (2020) "'People won't die due to the disease; they will die due to hunger": Exploring the impacts of covid-19 on Rohingya and Bangladeshi adolescents in Cox's Bazar.' *Policy brief. London: Gender and Adolescence: Global Evidence*

Cox's Bazar in Bangladesh is home to over two million Bangladeshi citizens and some 860,000 Rohingya refugees. In Cox's Bazar, health services have limited capacity and unclear mandates for providing health services for Rohingya refugees. Furthermore, the COVID-19 mitigation strategies have heightened pre-existing nutrition and health challenges for both Rohingya and Bangladeshi populations, with this potentially disproportionately affecting the adolescent population.

Report one investigates the nutrition and health challenges pre-COVID-19 for Rohingya and Bangladeshi adolescents (10 to 19 years of age) in Cox's Bazar. The report is based on mixed-methods data collected between March and October 2019 as a part of the Gender and Adolescence: Global Evidence (GAGE) longitudinal study. The study surveyed 2,280 adolescents and

conducted 149 in-depth interviews or focus group discussions with adolescents, their families, community leaders and service providers.

Report two features mixed-methods data collected between March and August 2020 from a sample of the Rohingya and Bangladeshi adolescents surveyed in 2019. The research consisted of 1,761 phone surveys with adolescents 10 to 19 years of age, 30 interviews with adolescents 15 to 19 years of age and seven key informant interviews. The report investigates the impact of the COVID-19 pandemic on Rohingya and Bangladeshi adolescents in the thematic areas of education and learning, bodily integrity, economic empowerment, health and nutrition and psychosocial wellbeing.

Pre-COVID-19 adolescents living in Cox's Bazar faced many challenges including food insecurity, age- and gender-based violence, disrupted

educational prospects, widespread psychosocial distress and worry, limited health service uptake and inadequate health services for persons with disabilities. Rohingya adolescents were identified as a particularly marginalised subgroup. One of the most severe impacts of the COVID-19 pandemic was the increased levels of food insecurity faced by both Rohingya and Bangladeshi adolescents with stark gender differences – girls were 50-60% more likely to report hunger due to COVID-19 than boys. Within the camps, while accurate health information seems to have been efficiently disseminated early in the response, some adolescents have since been left without reliable and accessible information. Child marriage is still a worry among adolescents in the camps although there were reports of decreased pressure to marry at the time of the survey. Data also suggests that married girls may be at greater risk of gender-based violence than their unmarried counterparts during the pandemic. Additionally, the decision to define education as a non-essential activity and the closure of protection services exacerbated inequities in access to education in the camps and limited access to safe spaces for adolescents facing increased violence. Across Rohingya and Bangladeshi adolescents, there were reports of decreased paid employment opportunities and anxiety regarding the COVID-19 pandemic.

Due to the findings of these reports, the following recommendations have been made:

- Urgently tackle food insecurity through the scale-up of existing programmes, including in-kind food and voucher support.
- Resume education and vocational training programmes by increasing alternative remote programmes and renew efforts to initiate the Myanmar curriculum programme for grades six to nine.
- Strengthen awareness-raising, reporting and the mitigation of age- and gender-based protection risks during the COVID-19 pandemic.
- Address restrictions to digital connectivity in the camps to promote access to information and online learning.

New UNICEF resource: Programming guidance for parenting of adolescents

Skeen, S, Levy, M, Haj-Ahmad, J (2021) *Programming Guidance for Parenting of Adolescents*. UNICEF. Available:

<https://www.unicef.org/reports/parenting-adolescents>.

Parents play an essential role in influencing how adolescents interact with the complex, interlinked factors that shape their development. Not only do positive parental relationships enhance developmental outcomes for adolescents but effective parenting can also alleviate the impact of negative external factors. The influence of parenting practices can also extend across generations. Building on parents' existing strengths and equipping them to provide support to their adolescent children through a parenting programming has the potential to have a profound positive influence on adolescent development.

UNICEF's Programming Guidance for Parenting of Adolescents (2021) aims to guide global efforts to strengthen evidence-based, holistic programming for the parenting of adolescents. The guidance is targeted at practitioners and stakeholders working on responses to support the parenting and caregiving of adolescents across sectors. It presents a series of recommended considerations and core content areas for parenting of adolescent programmes as informed by a comprehensive review of the existing evidence base.

In terms of key considerations, parenting programmes of adolescents should:

- Use a strengths-based approach that recognises parents' existing skills and experience and in turn supports them to nurture the strengths of their adolescents
- Promote gender-equitable norms and reduce exposure to gender-specific risks
- Promote adolescents' safe and meaningful participation within their families and communities according to their evolving capacities
- Be inclusive of all parents including the most marginalised
- Rely on the sizeable existing knowledge base on the parenting of adolescents.

Depending on the aims and the target audience, programmes for the parenting of adolescents would ideally contain core content to:

- Promote loving, warm and affectionate relationships between parents and their adolescent children using age-appropriate strategies to promote adolescent wellbeing
- Improve parents' knowledge of adolescent physiological, cognitive, social and emotional development to enable them to meet their adolescent children's needs more effectively
- Develop parents' skills to communicate respectfully with adolescents in a manner that respects their evolving capacities
- Support parents to employ positive, non-violent discipline techniques that communicate expectations and set parameters around adolescents' behaviour
- Empower parents to create safe environments by reducing exposure to risks and to assist their adolescent children to access support services
- Support parents to provide for adolescents' basic needs, such as through the inclusion of parenting programmes in social protection schemes that support families living in poverty, while taking account of adolescents' growing decision-making roles in the household
- Protect and promote parental mental health and link them with further care as required

The guidance further outlines how to plan for scale-up and sustainability from the initial stages of development to ensure the extended reach and lasting impact of the parenting of adolescents programming. It describes how to develop strong monitoring and evaluation systems that are essential to support and inform programme implementation. Finally, the resource offers a nine-step process to set out the specific activities required to design, deliver and evaluate parenting programmes of adolescents and to plan for future scale-up.

UNICEF is currently developing detailed messaging and implementation resources, based on the key considerations and core content outlined in the guidance, for implementing holistic parenting of adolescents' resources (expected early 2022). The guidance is currently available in English and Spanish.

UNICEF programming guidance: Nutrition in middle childhood and adolescence

UNICEF (2021). *UNICEF programming guidance: Nutrition in middle childhood and adolescence*. Available from:

<https://www.unicef.org/media/106406/file>

Middle childhood and adolescence are critical life stages when malnutrition has long-term implications on physical, social and mental growth and development. Undernutrition and chronic infections affect enrolment, attendance and performance at school, influencing children's ability to become productive adults. On the other hand, childhood overweight and obesity increase the risk of developing noncommunicable diseases such as diabetes and cardiovascular disease in later life.

In 2016, approximately 8% (75 million) of girls and 12% (117 million) of boys 5-19 years of age globally were classified as thin. For girls 15-19 years of age, the prevalence of anaemia ranged between 16% in the Middle East and North Africa and 54% in South Asia. In some low- and middle-income countries, ultra-processed foods comprise 18-35% of overall food consumption, contributing to the global rise in obesity that affected a staggering 125 million children 5-19 years of age in 2016. In many countries, these different forms of malnutrition coexist, highlighting the need for policies and programmes that address all forms of malnutrition through coordinated efforts across five key systems: education, food, health, water and sanitation and social protection.

UNICEF's recently published guidance aims to inform programming efforts to "protect and promote diets, services and practices that support optimal nutrition, growth and development in middle childhood and adolescence". The overarching framework is aligned with UNICEF's Nutrition Strategy 2020-2030¹ and articulates programme priorities as follows: (1) nutritious foods in schools and beyond; (2) healthy food environments in schools and beyond; (3) micronutrient supplementation and deworming; (4) nutrition education in school curricula; and (5) healthy dietary practices for school-age children and adolescents. Technical and operational guidance is provided for the design, implementation, monitoring and evaluation of programmes, all of which should be evidence-driven and respond to the nutrition situation, resources and other contextual factors specific to the target country. In addition, the meaningful engagement and participation of children and adolescents is needed to ensure that these groups are provided with appropriate platforms and means to produce knowledge, influence decision-making and drive progress. Finally, programming should be guided by key principles to ensure that implementation across priority areas is rights-based, equity-focused and gender-responsive.

Through its systems-based approach, UNICEF recognises the central role of the education system for reaching children with essential nutrition interventions, including providing nutrition education, school meals, micronutrient supplementation and deworming prophylaxis, as well as promoting and supporting opportunities to be physically active. The food system also plays a central role in shaping healthy food environments both in- and out-of-school while the health, water and sanitation and social protection systems should ensure access to diets, services and practices that support adequate nutrition, growth and development among children and adolescents. Integration across these systems, and their related delivery platforms, is critical to the effective design and delivery of evidence-based interventions and programmes that include robust reporting and monitoring frameworks to track progress towards the key priorities. The guidance also highlights the importance of including school-aged children and adolescents in humanitarian response as well as strategic partnerships with governments, academia, bilateral agencies, youth leaders, the private sector and other organisations as crucial to achieving results.

¹ Available at: <https://www.unicef.org/reports/nutrition-strategy-2020-2030>

People-driven SBC in practice combating stunting in Indonesia

By Julia Weatherson, Ritu Ghosh, Eriana Kartika, Octavia Mariance, Firda Dewi Yani and Tutut Sri Purwanti

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Report Summaries



This is a summary of the following report: *Empatika, Nutrition International, Save the Children International (2021) Study brief: people-driven social behaviour change (SBC) design in BISA project formative research.* [resourcecentre.savethechildren.net https://resourcecentre.savethechildren.net/document/study-brief-people-driven-social-behavior-change-sbc-design-bisa-project-formative-research/](https://resourcecentre.savethechildren.net/document/study-brief-people-driven-social-behavior-change-sbc-design-bisa-project-formative-research/)

Introduction and background

Despite Indonesia's significant economic gains and sustained improvements in human capital, the prevalence of malnutrition remains high and child development outcomes are poor. The prevalence of stunting in children under five years of age is 31% in West Java and 43% in Nusa Tenggara Timur (NTT) and the prevalence of anaemia is very high in adolescent girls aged 14 to 20 years, with the lowest prevalence being in West Bandung (68.8%) and the highest in Sumedang (82.6%) (Dewi et al, 2020). "Better Investment for Stunting Alleviation" (BISA, which means "We can" in Bahasa Indonesian language) is a five year integrated nutrition programme planned for 2019-2024, implemented jointly by Nutrition International and Save the Children in partnership with The Power of Nutrition and The Department of Foreign Affairs and Trade. It aims to reduce stunting by improving the nutritional status of adolescent girls, pregnant and lactating women, women of reproductive age and children under the age of two across two provinces, NTT and West Java. This report summarises the adolescent-focused findings from BISA's formative research which piloted the people-driven design of social behaviour change (SBC).

People-driven social behaviour change

In BISA, we emphasise the need for local solutions. Our vision is that when local people in communities are engaged, and when their own ideas of what they want to change and what can work for them are applied, this will result in sustainable behaviour change.

Formative research and people-driven design of SBC approaches were thus carried out following four steps to inform the programme design:

1. Immersion research by living in people's homes to understand their day-to-day realities
2. Structured qualitative field research
3. SBC design generation to develop ideas to change behaviours around their priorities
4. Trialling SBC designs by testing out the ideas generated by the community themselves

Among adolescent girls, we aimed to deepen our understanding of the context and determinants around two prioritised behaviours: iron intake (consumption of daily iron-rich food and weekly iron and folic acid supplements – WIFAS) and handwashing with soap.

Key findings on adolescents' perceptions and behaviours

While adolescent girls received WIFAS, the provision of tablets was insufficient, especially for school-based distribution, and thus adherence to consumption at the recommended dose was very low. Barriers included adolescent views that supplementation was not necessary as they did not have symptoms of anaemia and a lack of understanding about how iron consumption may affect future pregnancies. Adolescents also wanted to delay pregnancy and preferred to have a job first before starting a family.

Adolescent diets were generally based on rice and were low in protein. Adolescent girls did consume iron-rich/iron-fortified foods, more so in West Java (92%) than in NTT (84%), but in minimal amounts. In West Java, adolescents used pocket money to purchase fried, sweetened and packaged food for their school meals whereas less packaged snacks were eaten in NTT.

Although 81.7% to 96.9% of adolescents reported washing their hands with soap after defecation at baseline, direct observations did not confirm this finding. During immersion homestays with families, including adolescents, we found that families associated handwashing with re-

moving visible dirt, smells and sweat rather than non-visible germs. This was a barrier to appropriate hygiene.

Girls preferred information that was provided in "fun" ways, such as through games. They valued the opportunity to ask questions and preferred that facilitators be peers, rather than their teachers. They indicated that "preaching/telling" them what to do was not useful, as it did not relate to their own experience and did not use their informal and local language.

Learning to action

The immersion research tested whether reported behaviour was the same as practiced which was found to not always be the case. Research also gathered new insights that highlighted several gaps which helped to refine programme design. Those findings were used in BISA to ensure effective behaviour change among adolescent girls, for example:

- *WIFAS was disconnected from the motherhood message: "Healthy Adolescent Girl, Bright Future!"* (Nutrition International, 2019) was created as an overarching theme in SBC materials which included digital stickers, GIFs¹, posters and audio-visuals to promote the regular consumption of WIFAS.
- *Facilitation was interactive, activity-based and dialogue-learning driven:* Each group session featured discussions to limit lecture/preaching tendencies and peer-led group sessions were the prioritised delivery platforms for adolescents, coupled with activities/games.
- *Balanced and iron-rich diet was promoted:* For example, adolescents visually demonstrated diversity and portions of foods consumed in the previous day in "balanced plate" activities.
- *Healthy snacking was promoted instead of salty, fried, sweet snacks and junk foods:* The "Emo Demo" (Gerakan Rumpi Sehat, 2017) activity triggered a negative emotion of disgust when mixing chips with colourful flavoured drinks. Digital stickers also promoted the key message to avoid junk food.
- *Visual cues helped to increase handwashing with soap:* Rice Ball Germs (Save the Children Indonesia, 2021) is an SBC material that reveals invisible germs on a rice ball rolled by clean hands versus clean-looking dirty hands.

Going forward

This pilot project demonstrated that people-driven SBC design processes had traction with people in communities and garnered support from local service providers. As the BISA programme's implementation continues until 2024, it will build on these innovative approaches and integrate them within its suite of SBC interventions, as the programme intends to expand to a total of four districts in West Java and NTT.

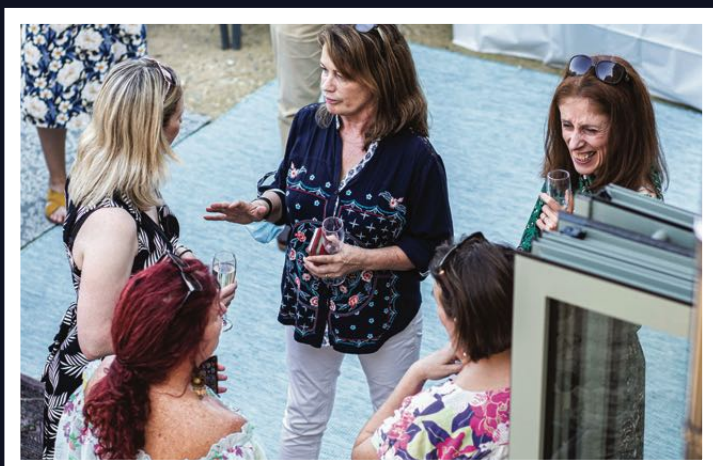
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¹ A GIF (Graphical Interchange Format) is an animated image format or soundless video that will loop continuously and does not require anyone to press play.

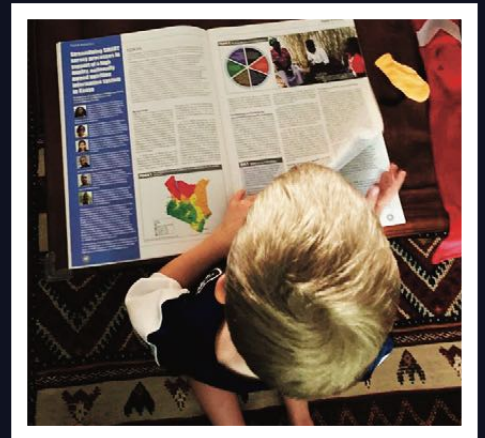
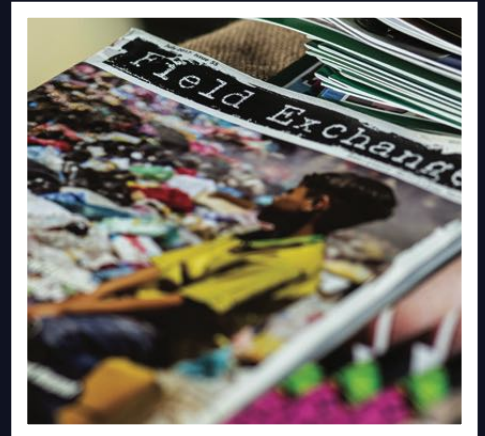
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ENN
25
YEARS
1996 – 2021



ENN staff, associates and trustees gathered in a sunny garden in mid-September to celebrate 25 years and toast our future with you all, our worldwide network who are the heart and soul of ENN.



With the knowledge that early interventions play a critical role in child and adolescent development, it is heartening to see that FEX readers are starting so young.



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Members of an Adolescent Group in Bangladesh;
©ENRICH Bangladesh

Field Exchange 66 advisory group

To support the development of this special edition, an advisory group was formed from members of the Adolescent Nutrition Interest Group. We extend warm thanks to the individuals who so generously gave their time and helped us with many aspects; from sharing the call for content far and wide, to thinking through communication strategies and how to best reach and engage with young people. The members are (in alphabetical order): Catherine Fleming, Geraldine Honton, Webster Makombe, Tasha Mhakayakora, Amanda Murungi, Natalie Roschnik and Deepika Sharma.



About ENN

Emergency Nutrition Network (ENN) is a UK registered charity that strives to enhance the effectiveness of nutrition policy and programming by improving knowledge, stimulating learning and building evidence. We are passionate about being field-driven and are globally recognised as thought leaders and conveners in nutrition.

ENN is based in the UK but works globally and is made up of a team of technical experts in nutrition with decades of collective experience in the field. We work alongside governments, the United Nations, non-governmental organisations or charities, and research institutions worldwide to look critically at existing practices, raise awareness of issues and drive change so that those working to tackle malnutrition can do the best possible job. We do this by:

1. Capturing what works and what is needed to reduce malnutrition – working with people implementing programmes to help them examine their experiences and document their achievements and challenges.
2. Coordinating technical bodies to increase the global understanding of malnutrition – particularly focusing on the most nutritionally vulnerable including infants and children, adolescent girls and mothers who are pregnant or are feeding their infants.
3. Supporting global efforts to reduce malnutrition – bringing our knowledge and technical expertise to strengthen the activities of organisations working to reduce malnutrition at the global level.

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