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# Effective Food Systems Innovations

## An Inventory of Evidence from Bangladesh, Ethiopia, Nigeria, Viet Nam, and Other Low- and Middle-Income Countries

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## INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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## ABSTRACT

To address malnutrition in low- and middle income countries (LMICs), more evidence is needed about the potential of food system innovations to help guide the transformation towards healthier, more sustainable, and equitable food systems. This paper reviews the literature on food system innovations in the food environment and addressing consumer behavior on diet and nutrition-related outcomes in Bangladesh, Ethiopia, Nigeria, Viet Nam, and other LMICs, then highlights promising innovations and demonstrates gaps in the literature. In the food environment, promising innovations include nutrition-relevant multi-sectoral national policy backed by effective implementation; institutional purchasing offering healthy meals in school or factory environments; compulsory nutrition labelling; and fortified foods, if these can be durably offered or viably commercialised. Promising innovations influencing consumer behavior include unhealthy food taxes; large-scale information campaigns raising awareness about specific unhealthy food items; and campaigns that provide information and/or fortified food (supplements) to address nutrition of infants and young children. Promoting women's empowerment and targeting women with nutrition information could be effective food system innovations addressing consumer behavior, but deliberation is needed about risks of emphasizing the instrumental role of gender equity and women's empowerment for nutrition or reinforcing gender roles and increasing women's responsibilities. That said, our review also demonstrates a general lack of evidence on most types of food system innovations in the four primary countries of study. More evidence is needed on several types of food systems innovations before definitive advice can be given on guiding food systems transformations towards healthier diet outcomes. This review therefore acts as a starting point for addressing country-specific food system challenges and identifies needs for further research.



**Keywords:** food environment, food systems, consumer behavior, literature review

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## ACRONYMS

| | |
|---|---|
| 3ie | International Initiative for Impact Evaluation |
| A4NH | CGIAR Research Program on Agriculture for Nutrition and Health |
| BCC | Behavior change communication |
| BMI | Body mass index |
| LMIC | Low- and middle-income countries |
| WASH | Water, sanitation, hygiene |

# I. INTRODUCTION

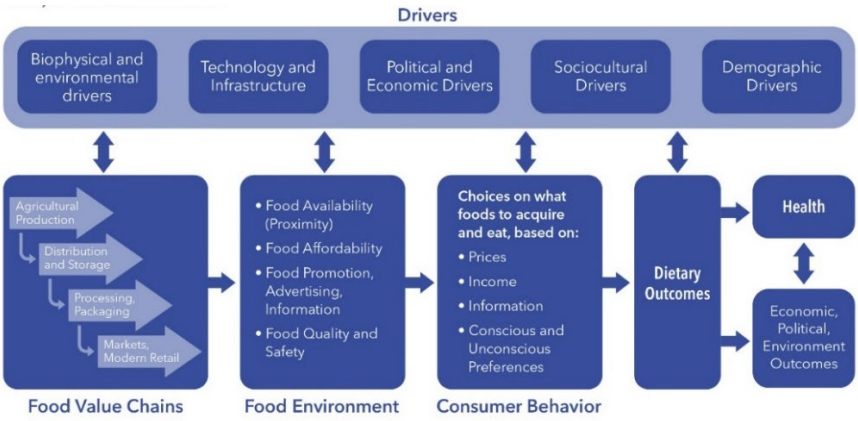
Malnutrition in at least one of its forms afflicts around one third of the global population, a proportion that is projected to increase (HLPE, 2017). Malnutrition exists as either undernutrition, micronutrient deficiencies, or as overweight and/or obesity status. The different forms of malnutrition can co-exist within contexts and within population groups, including in low- and middle-income countries (LMICs) (WHO, 2017). Each of the forms of malnutrition has different adverse consequences for health, mental and physical development, growth, and risks of non-communicable diseases, which may differ by stage of the life cycle. Adequate diet quality throughout the life cycle is essential to avoid these (de Brauw et al., 2020).

The triple burden of malnutrition suggests food systems are not providing consumers with options to choose diets with adequate nutritional value. The food system is a concept incorporating food supply chains, food environments, and consumer behavior related to food, and influence the foods people choose to consume (Figure 1) (HLPE, 2017). From an economic perspective, a market failure is occurring: food prices may reflect relative scarcity, but do not absorb the private or societal costs of unhealthy diets reflected in the consequences of malnutrition. To overcome this market failure and provide for healthier diets, changes in food systems that simultaneously support supply-side opportunities and demand-side motives for healthier food choices at prices that make healthier food available at all wealth levels are necessary (Ruben et al., 2019).[1]

At present, food systems outcomes are inadequate from the perspectives of a) healthy diets and nutrition, b) environmental sustainability, and c) inclusion and equity. It is widely recognized that food systems

[11] The United Nations Food Systems Summit 2021 Scientific Group proposed the following definition : "A healthy diet is one that is human health promoting and disease preventing, and safeguarding of planetary health by: a) providing adequacy without excess, of nutrients from foods that are nutritious and healthy; and b) avoiding the introduction of health-harming substances, through all stages of the value chain. Healthy diets must be affordable, culturally acceptable. They must progressively change towards originating from sustainable production and processing systems that do not adversely affect local and regional ecologies." (Neufeld et al., 2020).

cannot be counted on to autonomously evolve toward more adequate outcomes in terms of diets, environmental sustainability, inclusion and equity (HLPE, 2017). Further, the goals for steering food systems transformation depend upon the present stage of food systems (McDermott & de Brauw, 2020).




The **food supply chain** consists of the activities and actors that take food from production to consumption and to the disposal of its waste (HLPE, 2017:24).

The **food environment** refers to the physical, economic, political and socio-cultural context in which consumers engage with the food system to acquire, prepare and consume food. It consists of physical food entry points, the built environment allowing consumers to access these spaces, personal determinants of food choices, and political, social and cultural norms that underlie these interactions (HLPE, 2017: 28).

**Consumer behaviour** reflects the choices made by consumers on what food to acquire, store, prepare, and eat, and on the allocation of food within the household. Consumer behaviour is influenced by personal preferences, taste, convenience, values, traditions, culture and beliefs, and shaped by the existing food environment (HLPE, 2017: 31).

*Figure 4 Conceptual framework of food systems for diets and nutrition*

Food system innovations are one way to promote such food system transformation. From a dietary perspective, a food system innovation can be defined as a policy or regulation, an institutional process, a change in knowledge, a technology, or combination thereof that is either not used or not widely used within a food system, with the potential to change diets on a wider scale (e.g. Hekkert et al., 2007). Based on an analytical understanding of interactions within a food system, different types of innovations can be designed to potentially support healthier diets among individuals. Rather than only considering how to increase the supply of healthier foods, either overall or within specific food environments, this approach allows for complementary or stand-alone behavioral change campaigns among consumers or other food system actors (de Brauw et al., 2019: 1).

Apart from an International Initiative for Impact Evaluation (3ie) systematic review of food systems interventions relating to food security (Moore et al., 2021), to our knowledge, an inventory combining a systematic search and review of evidence of food system innovations is currently not available (Grant & Booth, 2009). Yet, such an inventory is quite relevant in the light of the 2021 United Nations Food Systems Summit and the urgent need for evidence of the potential of food system innovations to address malnutrition through healthier, more sustainable and equitable food systems. The objective of this inventory is to provide an overview and synthesis of evidence of different types of food system innovations that could facilitate progress toward food systems that perform better in terms of diets, sustainability, and inclusion. The inventory will focus on innovations in the food environment and innovations addressing consumer behavior and zoom in on outcomes related to healthy diets and nutrition, in the first instance, and on inclusion and equity, in the second instance.

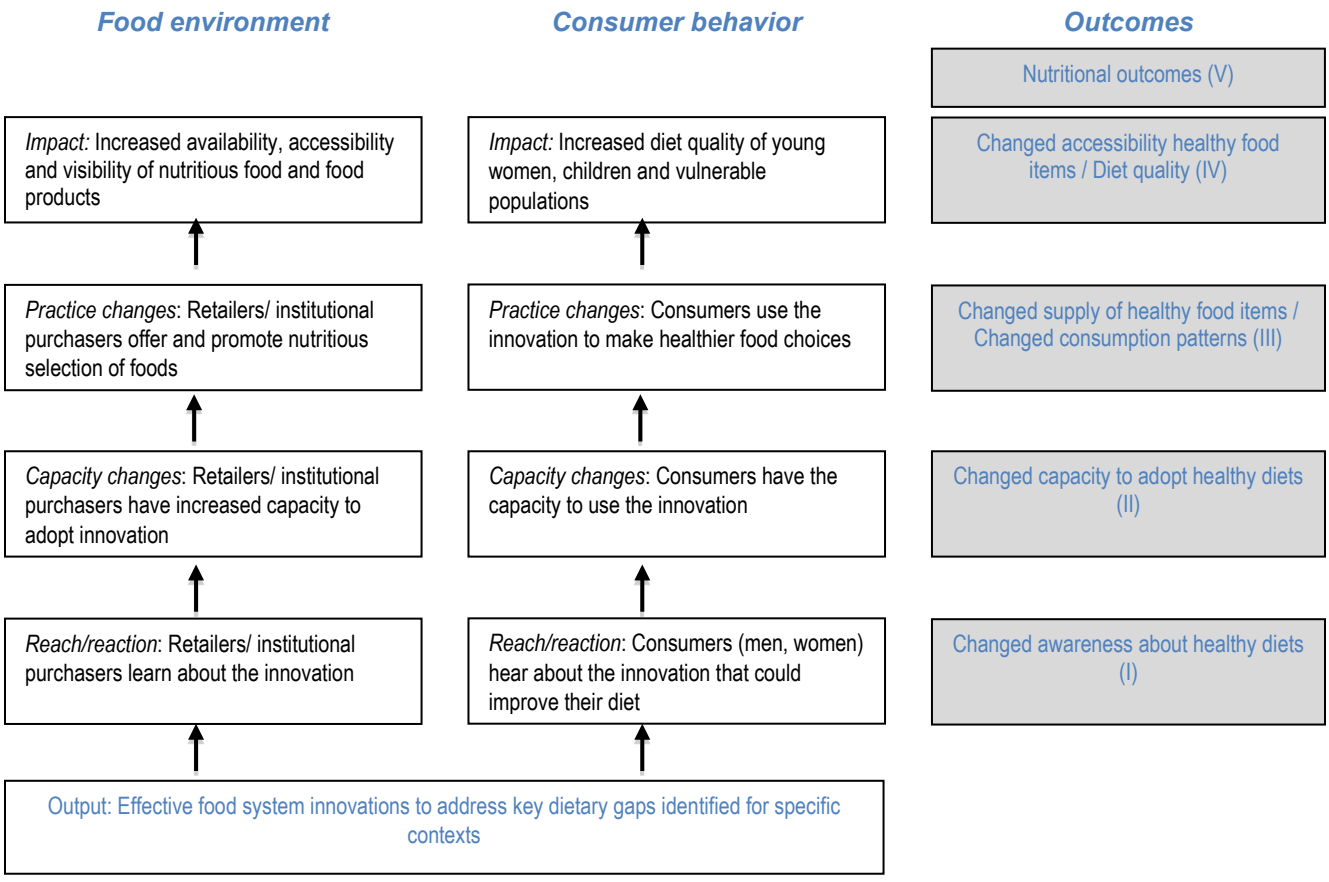



*Figure 5 Pathways of change in the food environment and among consumers (adapted from A4NH (2018))*

More specifically, the primary objective of this inventory is a systematic search and review of evidence of the impact of food system innovations targeting the food environment and consumers, that work through policy, institutions, or technology, on outcomes along the pathways of change in the food environment and among consumers (Figure 2). The inventory will primarily include evidence for the four focus countries of the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH): Bangladesh, Ethiopia, Nigeria, and Viet Nam. The secondary objective of this inventory is to review the contribution of the identified food system innovations to reducing gender discrepancies in healthy diets and malnutrition. It seeks to identify evidence of impacts and evidence of gender accommodating and gender transformative food system innovations, in acknowledgement that gender relations and women's empowerment play an important role in achieving nutrition impacts, that vulnerability to malnutrition may be gender specific (A4NH, 2015), and that men and women may also respond differently to innovations (de Brauw et al., 2019: 23).[2]

[2] Gender accommodating programs acknowledge gender inequalities and gender relations and seek to ensure that women benefit but do not attempt to reduce gender inequality or address the gender systems that contribute to the differences and inequalities. Gender transformative programs seek to transform gender relations to promote gender equality (USAID, 2017).

# II. METHODS

## 2.1. Selection of studies

To limit the scope of our review, we focus on studies that show impacts of food system innovations targeting the food environment and consumer behavior, leaving aside the large literature on food supply chain interventions. We included evidence of food system innovations according to a typology of food system innovations proposed by de Brauw et al. (2019) (Figure 2). A criterium for inclusion was that the food system innovations should have interactions within a food system, or be based on an analytical understanding, can be reasonably assumed to have durable implications for dynamics in the food system (de Brauw et al., 2019: 2).

As a priority, we selected studies that provide evidence of impact using robust methods for identification using quantitative research methods. Studies using less robust methods for identification or using high-quality robust qualitative methods were included as well when they provided interesting insights into associations between the food system innovations and outcomes relevant from a healthy diets and nutrition perspective. We included studies published since 2005 in peer-reviewed journals or reports and working papers from trustworthy sources.

As a priority, we included evidence of impact of food system innovations in Bangladesh, Ethiopia, Nigeria, Viet Nam, the focus countries most relevant for A4NH. If evidence from the focus countries was missing or limited, we included evidence from other LMIC.

The inventory includes 150 publications. Food system innovations in Bangladesh are discussed in 45 studies, in Ethiopia in 30 studies, in Nigeria in 16 studies, in Viet Nam in 34 studies. Twenty-eight studies deal with food system innovations in other LMIC.

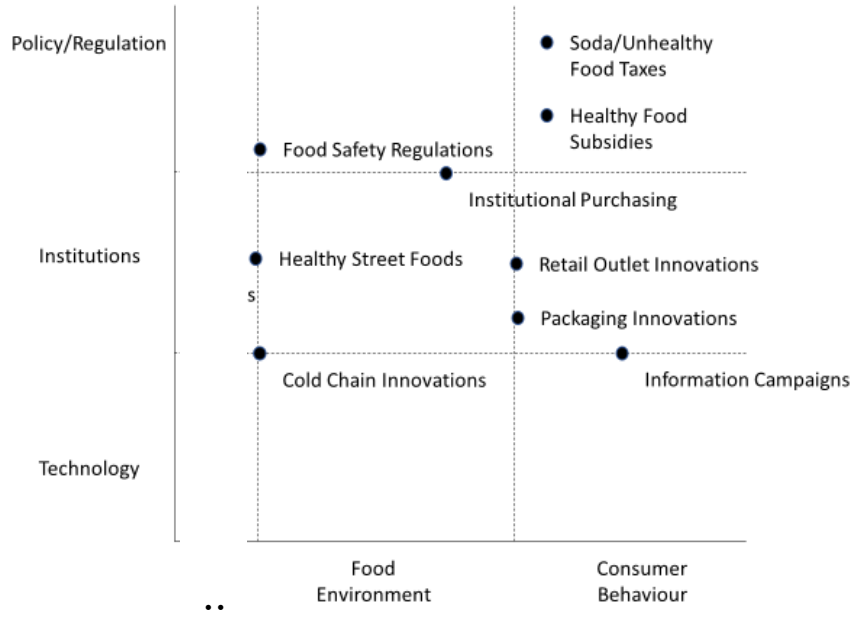



*Figure 6 Typology of food system innovations (de Brauw et al., 2019: Fig.2)*

## 2.2. Review process

We applied a method labelled *systematic search and review*, which combines strengths of critical review with a comprehensive search process (Grant & Booth, 2009). We combined this method with an evidence map summarizing a quality assessment of the evidence and other characteristics of the evaluation.

We first identified studies according to the food system innovations typology (Figure 3) by searching on key words, including but not limited to nutrition, (healthy) diets, food, impact, effect, evaluation, and assessment, as well as the names of the different types of food system innovations in the typology. We identified additional studies through reference lists and citations of initially identified studies. In addition to those search strategies, we specifically searched through publications by A4NH and A4NH researchers. Finally, we consulted the 3ie Food Systems and Nutrition Evidence Gap Map and identified a number studies that were not yet included (Moore et al., 2021). In the spirit of a systematic search and review, we aimed for and adopted multiple strategies to arrive at a comprehensive and exhaustive list of studies for the focus countries.

Second, we listed the reference, year of publication, country, target group of the food system innovation, type and description of the food system innovation, identification strategy, outcome indicators, the food system innovation's approach to gender, the extent of attention for gender in the analysis, and a summary of the main results of each relevant study. This information, classified per type of food system innovation, is included in the Annex.

Based on the screening in the second step, as a third step, we classified the studies according to the typology of food system innovations. Table 1 shows the classification of food system innovations in this inventory. We also decided to bundle food system innovations related to infant and young children's nutrition, sub-classifying these in three types.

| | **Food Environment** | **Consumer Behavior** |
|---|---|---|
| **Policy/Regulation** | I. Nutrition-relevant policy and regulations<br>II. Policy or regulations with regard to nutrition labelling and dietary guidelines | I. Unhealthy food taxes and healthy food subsidies<br>II. Cash and/or in kind transfers |
| **Institutions** | I. Packaging innovations, including nutrition labelling<br>II. Retail outlet innovations<br>III. Healthy street foods<br>IV. Institutional purchasing<br>V. Private sector initiatives in fortified foods marketing and sales<br>VI. Urban agriculture | I. Women's empowerment as an institutional change<br>II. Information campaigns<br>III. Programs or interventions to improve nutrition of infants and young children<br>a) Information campaigns<br>b) Information campaigns and fortified food (supplements) combined |
| **Technology** | I. Storage and cold chain innovations<br>II. Fortified foods | c) Programs offering fortified food (supplements) |

*Table 2 Classification of food system innovations in this inventory*

Fourth, we developed an evidence map following the methodology described in Snilstveit et al. (2016) (Section 3.1). Our evidence map gives an indication of the country, the stage of the outcome indicator in the pathway of change, the quality and strength of the evidence, the food system innovation's approach to gender and extent of attention for gender in the analysis (secondary objective), and finally, whether the food system innovation's impact (or association) is positive (i.e. in favour of improving nutrition), not significant, or negative. We distinguish five stages along the pathway of change including, in increasing order, a) outcome indicators of changed awareness about healthy diets, b) changed capacity to adopt

healthy diets, c) changed supply of healthy food items (food environment) or changed consumption patterns (consumer behaviour), d) changed accessibility of healthy food items (food environment) or diet quality (consumer behaviour), and e) nutritional outcomes.

Our assessment of the quality and strength of the evidence is informed by methods used in Campbell Systematic Reviews, Cochrane Systematic Reviews (GRADE approach) and by the UK Department for International Development (DFID, 2014: 20; Lee et al., 2020; Schünemann et al., 2020). We assessed the quality and strength of the evidence, particularly on the basis of internal validity and distinguished four levels. These include, in increasing order, a) observational studies of association, quantitative before-after studies using different samples, and qualitative studies using a restricted range of methods, b) quantitative before-after studies or with-without studies and qualitative studies using an array of structured qualitative observational methods, c) studies with high-quality quasi-experimental research designs, and d) studies with high-quality experimental research designs or high quasi-experimental research designs with sensitivity analyses. In addition, if replicability (external validity) of the study is limited because the results are likely to be context or sample-specific, we downgraded the quality and strength of evidence level by one level.

Our assessment of the food system innovation's approach to gender and the extent of attention for gender in the analysis is informed by the Gender Integration Continuum tool (USAID, 2017). We assessed, on the one hand, the extent to which the policy, program, or intervention was gender blind (ignores gender, gender differences, and gender relations), gender accommodating (acknowledges gender, gender differences, and gender relations but works around and does not necessarily seek to address them), gender transformative (seeks to transform gender relations to promote gender equality), or uniquely focused on women or female caregivers of children. On the other hand, we assessed the extent to which the analysis was gender blind, gender aware (aware of gender differences and bringing them into the analysis by controlling for gender), or disaggregated by gender (albeit including a comparative analysis by gender). In

the evidence map, we indicated whether a) there is some consideration of gender in the policy, program, or intervention or in the analysis, b) there is a unique focus on women, or c) it concerns a gender blind policy, program or intervention and/or gender blind analysis.

As a fifth step, we analysed the identified evidence per type of food system innovation in more detail. This informed the narrative description of the evidence of each of the types of food system innovations and some highlighted results in Section 3.2.

Finally, based on the detailed analysis conducted in step five, we performed a light version of meta-analysis to inform the observations with regard to the secondary research objective of gender and gender equity (Section 3.3.), detect evidence gaps in terms of food system innovation types and analysis of impact of food system innovations (Section 3.4.), and identify potentially promising food system innovations (Section 3.5.).

### 2.3. What the inventory is not

Our inventory of evaluations of food system innovations is not an exhaustive or systematic review. We do not conduct a meta-analysis of impact of specific types of food system innovations. Neither do we compare effectiveness or effect size of different food system innovations or of similar innovations in different contexts.

We excluded evaluations of pre-natal interventions. We excluded studies of agriculture-related innovations that only prove impact on the beneficiary farmers, because it is uncertain whether such innovations have the potential to create dynamics across the food system, hence can be considered potential food system innovations. We further excluded evaluations of biofortification because we consider these innovations in the food supply chain rather than within the food environment.

Innovations related to food safety are excluded from the inventory as well, even if challenges of malnutrition may be linked or exacerbated by food safety challenges. We decided to do so because innovations addressing food safety differ from food system innovations addressing healthy diets and nutrition given their focus on preventing food-borne diseases by addressing hazards, such as microbial pathogens, parasites, chemical contaminants and biotoxins (HLPE, 2017; WHO, 2015). Food safety metrics are specific as well (Grace et al., 2018). Moreover, there is an extensive body of literature focused on innovations addressing food safety, some of it reviewed in Hoffmann et al. (2019).

# III. RESULTS

We first present a map summarizing evidence of impact of food system innovations targeting the food environment and consumers who work through policy, institutions, or technology (Section 3.1). We then provide a narrative description related to evidence on each type of food system innovation included in the map (Section 3.2). Subsequently, we present findings related to gender and gender equity of the food system innovations (Section 3.3), after which we discuss evidence gaps (Section 3.4). We end with a discussion of potentially promising food system innovations (Section 3.5).

## 3.1. Evidence map *(Table 2)*

**Food environment**

**Policy / Regulation**

**I. Nutrition-relevant policy**

| V I 0 | B V + | B V + | E II + | E V + | N II + |
|---|---|---|---|---|---|
| (Harris et al., 2016) | (Kessler et al., 2017) | (Nisbett et al., 2017) | (Warren & Frongillo, 2017) | (Ryckman et al., 2019) | (Vanderkooy et al., 2019) |

**II. Nutrition labelling and dietary guidelines**

| V I / | O III + | O III + | O III + | O II + | O III + |
|---|---|---|---|---|---|
| (Hop et al., 2011) | (Taillie et al., 2020) | (Quintiliano Scarpelli et al., 2020) | (Massri et al., 2019) | (Ares et al., 2021) | (Croker et al., 2020) |

**Institutions**

**I. Packaging innovations**

| E V + | E III + | O I + | O III + | O II + | O I + |
|---|---|---|---|---|---|
| (Lenjiso et al., 2016; Ruben et al., 2017) | (Bekele et al., 2016) | (Khandpur et al., 2018) | (Shangguan et al., 2019) | (Grummon & Hall, 2020) | (Zou & Liu, 2019) |

**II. Retail outlet innovations**

| V IV 0 | V III 0 | V III / | V IV + | O V - | O V + | O V - | O III+/- |
|---|---|---|---|---|---|---|---|
| (Rupa et al., 2019) | (Figuié & Moustier, 2009) | (Wertheim-Heck & Raneri, 2020) | (Trinh et al., 2020) | (Demmler et al., 2018) | (Debela et al., 2020) | (Umberger et al., 2015) | (Khonje & Qaim, 2019) |

**III. Healthy street foods**

| O II 0 | N III + |
|---|---|
| (Sun et al., 2015) | (Snoek, et al, 2020) |

**IV. Institutional purchasing**

| B V + | B V + | N III + | N III +/- | N / | V V + | V III + |
|---|---|---|---|---|---|---|
| (Hossain et al., 2019) | (Murayama et al., 2018) | (Agbon et al., 2012) | (Ayogu et al., 2018) | (Ademokun et al., 2014) | (Hall et al., 2007) | (T. Nguyen et al., 2020) |

**V. Private sector and local initiatives in fortified foods marketing**

| B IV 0 | B V + | E II / | N III + | N III / | V V + |
|---|---|---|---|---|---|
| (Agnew & Henson, 2018) | (Ahmed et al., 2020; Danse et al., 2020) | (Danse et al., 2020) | (Bee et al., 2015) | (Nwuneli et al., 2014) | (Rocha et al, 2018b; Rocha et al., 2018a) |

**VI. Urban agriculture**

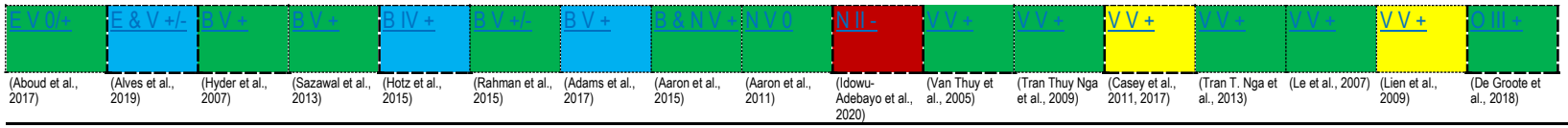
| B-N-V IV + |
|---|
| (Zezza & Tasciotti, 2010) |

**Technology**

**I. Storage and cold chain innovations**

| E II + | V IV + | V II + |
|---|---|---|
| (Roche et al., 2017) | (Heard et al., 2020) | (Rinkinen et al., 2019) |

**II. Fortified food (supplements)**

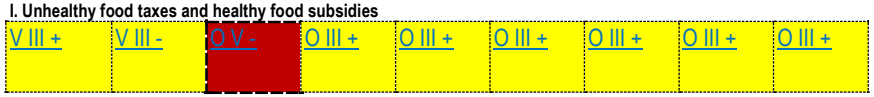



(Aboud et al., 2017) (Alves et al., 2019) (Hyder et al., 2007) (Sazawal et al., 2013) (Hotz et al., 2015) (Rahman et al., 2015) (Adams et al., 2017) (Aaron et al., 2015) (Aaron et al., 2011) (Idowu-Adebayo et al., 2020) (Van Thuy et al., 2005) (Tran Thuy Nga et al., 2009) (Casey et al., 2011, 2017) (Tran T. Nga et al., 2013) (Le et al., 2007) (Lien et al., 2009) (De Groote et al., 2018)

## Consumer behaviour

## Policy / Regulation

### I. Unhealthy food taxes and healthy food subsidies




(Luong & Vu, 2020) (Schram et al., 2015) (Asfaw, 2007) (Colchero et al., 2016, 2017) (Ng et al., 2019) (Batis et al., 2016) (Caro et al., 2018) (Nakamura et al., 2018) (Teng et al., 2019)

### II. Cash and/or in kind transfers


(UNICEF MOLSA & IFPRI, 2020) (Berhane et al., 2017) (Porter & Goyal, 2016) (Debela et al., 2015) (A. U. Ahmed et al., 2007, 2009) (Mascie-Taylor et al., 2010) (Hoddinott et al., 2018) (A. Ahmed et al., 2019) (USAID, 2018) (Nkonya et al., 2019) (Cuong, 2013)

## Institutions

### I. Institutional changes - Women's empowerment


(Yimer & Tadesse, 2015) (Santoso et al., 2019) (Headey et al., 2017) (Quisumbing et al., 2020)

### II. Information campaigns


(Kramer, 2017) (Davidson et al., 2021) (SPRING, 2018) (Harris-Fry et al., 2016) (Yetnayet et al., 2017) (Jatau, 2013) (Daudt et al., 2018) (Ha & Chisholm, 2011) (Do et al., 2016) (T. Nguyen et al., 2020) (Ayisi Addo & Steiner-Asiedu, 2019)

### III. Child nutrition

#### a) Information campaigns


(J. White & Mason, 2012) (Moss et al., 2018; Worku et al., 2020) (Fenn et al., 2012) (Kang, Kim, et al., 2017b; Kang, Suh, et al., 2017a) (Tariku et al., 2015) (Kim et al., 2016) (Kim et al., 2019) (Levinson et al., 2005; Moazzem Hossain et al., 2005; Sack et al., 2005; H. White & Masset, 2007) (Shi & Zhang, 2011) (Warren et al., 2020) (Menon et al., 2016) (Kim et al., 2018) (Ara et al., 2019) (Swapan Kumar Roy et al., 2007) (Aboud et al., 2013) (Jannat et al., 2020) (Lawal & Jibowo, 2006) (Rana et al., 2018) (P. H. Nguyen et al., 2014) (Rawat et al., 2017) (Kerr et al., 2016)

#### b) Combined information and fortification campaigns


(Stewart et al., 2019) (S. K. Roy et al., 2005) (Smith et al., 2013) (Aboud & Akhter, 2011) (Christian et al., 2015) (Passarelli et al., 2020) (Omer et al., 2018) (Teshome et al., 2020) (Negash et al., 2014) (Hansford et al., 2017) (Panjwani & Heidkamp, 2017)

## Technology

### c) Programs offering fortification


(Samuel et al., 2018) (Segrè et al., 2015) (Tam et al., 2020) (Pimpin et al., 2019) (Das et al., 2019) (Rah et al., 2011) (Mahfuz et al., 2020) (Afsana et al., 2014; T. Ahmed et al., 2014; Sarma et al., 2016) (Cummins et al., 2018) (Dewey et al., 2018) (Korenromp et al., 2016) (Van Hoan et al., 2009) (Phu et al., 2012) (Berger et al., 2006) (Smuts et al., 2005)

*Legend:*

| Country | | Level of outcome indicator | | Effect | | Gender | | Quality, strength of evidence | Internal validity | | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bangladesh | **B** | Nutritional outcomes | **V** | Positive (i.e. in favour of improving nutrition) | **+** | Some consideration of gender in intervention or analysis |  | Very strong | High quality experimental design or high quasi-experimental with sensitivity analysis | | 4 |
| Ethiopia | **E** | Changed accessibility healthy food items / Diet quality | **IV** | No effect | **0** | Focus on women |  | Strong | High quality quasi-experimental research design | | 3 |
| Nigeria | **N** | Changed supply of healthy food items /Changed consumption patterns | **III** | Negative | **-** | Gender blind intervention and/or analysis |  | Medium | Quantitative before-after or with-without studies<br>Qualitative using array of structured qualitative observational methods | | 2 |
| Vietnam | **V** | Changed capacity to adopt healthy diets | **II** | Not applicable | **/** | | | Limited | Observational studies of association, quantitative before-after with different samples<br>Qualitative using a restricted range of methods | | 1 |
| Other LMIC | **O** | Changed awareness about healthy diets | **I** | | | | | No evidence | | | |

*If replicability is limited because the results are likely to be context or sample-specific* *Score - 1*

Source: Authors' search.

## 3.2. Review of evidence of different types of food system innovations

### *3.2.1. Food environment – Policy / Regulation*

In terms of policy and regulations in the food environment, we identified five observational studies that evaluated processes and actors involved in ***nutrition-relevant policy*** in the focus countries. Decentralisation of nutrition-relevant policy is associated with better awareness about healthy diets in Viet Nam, particularly of infants and young children (Harris et al., 2016). Nutrition-relevant policy focused on undernutrition and micronutrient deficiencies, mainstreamed across sectors including nutrition, health, agriculture, and social protection, can enhance capacity to adopt healthy diets in Ethiopia and Nigeria, if backed with effective implementation at the local level (Nisbett et al., 2017; Vanderkooy et al., 2019; Warren & Frongillo, 2017). In the case of Bangladesh, such intersectoral nutrition-relevant policy, as well as bilateral aid programs, are associated with better nutrition outcomes (Kessler et al., 2017; Nisbett et al., 2017). Across sub-Saharan African countries, including Ethiopia, the Feed the Future initiative, a multi-sectoral nutrition-sensitive initiative targeting food security, agriculture, and nutrition, reduced the prevalence of stunting and underweight in children under five years of age, including over the longer term (Ryckman et al., 2019).

One study in our review discusses the updated third version of food-based dietary guidelines for Viet Nam (Hop et al., 2011). Given absence of (obligatory) nutrition labelling in the focus countries, evidence of ***compulsory nutrition labelling*** in Latin American countries is included. All five studies are based on before-after comparisons since nutrition labelling was introduced as a nationwide policy (Ares et al., 2021; Croker et al., 2020; Massri et al., 2019; Quintiliano Scarpelli et al., 2020; Taillie et al., 2020). Generally, after the introduction of nutrition labelling, there is a greater supply of food items with lower content of the labelled-unhealthy elements, and consumption patterns that are in favor of healthier diets.

### *3.2.2. Food environment – Institutions*

***Packaging innovations***, particularly non-compulsory traffic light labels and warning labels signalling healthfulness or content of unhealthy elements, are a first type of food system innovation in the domain of institutions in the food environment. One high-quality study demonstrates a positive willingness-to-pay for reduced-fat milk in urban Ethiopia (Bekele et al., 2016). Other studies concern packaging innovations in non-focus countries. They are high-quality (quasi-) experimental studies of food labelling demonstrating generally positive effects in terms of increasing awareness about healthy diets (Khandpur et al., 2018), enhancing the capacity to adopt healthier diets (Grummon & Hall, 2020), or improving consumption patterns (Shangguan et al., 2019). One observational study shows a stronger positive association between availability of nutrition information and (online) sales when the food item is perceived as healthy than when it is perceived as unhealthy (Zou & Liu, 2019).

***Retail outlet innovations***, particularly supermarkets, form a second type of food system innovation in the domain of institutions in the food environment. One medium-quality quasi-experimental study in urban Viet Nam did not find a significant effect of food shopping in supermarkets on households' diet diversity. It found mixed effects on nutritional quality of diets (Rupa et al., 2019). A low-quality study shows that per capita household expenditure and proportion of food purchased (rather than self-produced) are positively associated with higher diet diversity and lower shares of carbohydrates in consumed food groups regardless of large, medium, and low numbers of supermarkets in the region. In regions with large numbers of supermarkets, per capita household expenditure is negatively associated with the ratio of fat over protein share in food groups; in other regions positively (Trinh et al., 2020). One qualitative study reflects how higher prices in supermarkets, travel distance and limited storage at home form barriers to supermarket shopping by poor urban consumers in Hanoi, Viet Nam (Figuié & Moustier, 2009). Another, more recent, qualitative study shows that Hanoi residents do not perceive supermarkets to perform better in terms of food safety than traditional markets. Traditional markets respond better to preferences for daily purchased fresh foods readily cleaned and cut. Poor urban consumers also rely on informal

networks, including online collective buying groups, to acquire fresh food (Wertheim-Heck & Raneri, 2020). Other evidence related to non-focus countries. In urban Zambia, supermarket shopping, which is more likely with higher incomes, is associated with higher consumption of processed foods, sweetened beverages, animal-sourced proteins, and lower consumption of fruits (Khonje & Qaim, 2019). Quasi-experimental studies for small towns in Kenya show that supermarket shopping enhances food variety and dietary diversity in households, and increases children's height-for-age and weight-for-age z-scores (Debela et al., 2020), but also increases adult's body mass index (BMI) (Demmler et al., 2018). In Indonesia, a quasi-experimental study of supermarket shopping shows no significant effect on adults' BMI, but a positive effect on children's BMI. It also increases the likelihood of children being overweight or obese in high-income households (Umberger et al., 2015).

While ***healthy street food*** is seen as a potentially promising innovation in the food environment given the importance of street food and street vendors in urban consumption patterns in many LMICs (de Brauw et al., 2019), there is hardly any evidence. An observational proof-of-principle study in urban Nigeria found that customers of an intervention called Veg-on-Wheels, that sells washed, pre-cut, and cooled green leafy vegetables, appreciate the quality, hygiene and healthiness of its products. Veg-on-Wheels has the potential to meet consumers' criteria for food safety, freshness of the product, and trust in the vendor and to contribute to higher consumption of green leafy vegetables and a greater variety of vegetables (Snoek et al., 2020). An observational qualitative study of the introduction of healthy pizza in urban Kenya did not find evidence of changed capacity to adopt a healthy diet (Sun et al., 2015).

***Institutional purchasing*** is a fourth type of food system innovation in the domain of institutions in the food environment. Several (quasi-)experimental studies of the impact of institutional purchasing exist in the focus countries, particularly related to the provision of school meals or by companies at lunchtime. In Bangladesh and Viet Nam, providing healthy school meals or snacks are found to have positive effects on height(-for-age), weight and nutrient adequacy in blood of primary school children (Hall et al., 2007;

Murayama et al., 2018), and on diet quality in terms of fruit and vegetable consumption (T. Nguyen et al., 2020). For Nigeria, low-quality observational studies found mixed results in terms of supply of school meals with adequate nutritional value (Agbon et al., 2012; Ayogu et al., 2018), and adequate implementation of a school health program (Ademokun et al., 2014). Workplace nutrition programs, combining iron-folic acid supplements and behavior change counselling, albeit with a healthy lunch, improved nutrient adequacy in the blood of adult female garment workers in Bangladesh (Hossain et al., 2019).

Initiatives of ***marketing and sales of fortified foods led by or with involvement of private sector actors*** are not highly likely to be systematically evaluated, and, if evaluated, results are not necessarily published.[3] We identified descriptive low-quality studies of experiences of private sector-initiated marketing of fortified foods including Bee et al. (2015) and Nwuneli et al. (2014) for Nigeria, and descriptive studies of social business models based on collaboration between non-profit and private sector for the marketing of fortified foods in Bangladesh (Agnew & Henson, 2018), Vietnam (Rocha et al., 2018a; Rocha et al., 2018b) and Ethiopia (Danse et al., 2020). Only one study uses a higher-quality quasi-experimental study of impact of marketing a fortified product in a social business model with a private sector partner on nutritional outcomes in Bangladesh (S. Ahmed et al., 2020; Danse et al., 2020). Overall, local sourcing of inputs for locally-produced fortified products, albeit as a social goal, is found to be relatively expensive and subject to price and supply fluctuations. Companies also face high costs in building sustainable demand and creating consumer awareness about the micronutrient richness of their products. Marketing and distribution costs to offer a regular supply and reach sufficient customers, including the poor and rural populations, are high. Keeping products affordable is a challenge, sometimes solved by offering smaller packaging. Only one study looks at implications for nutrition and states that consumption of locally produced fortified instant rice porridge in Viet Nam is associated with lower underweight and wasting rates in children (Rocha et al., 2018b).

[3] Personal communication with Linnemann, A. (25/11/20); Ingenbleek, P. (10/11/20); Lane, C. (15/01/21).

The one study included here on ***urban agriculture*** assessed the association between household engagement in urban agriculture and measures of household diet diversity, concluding it is generally positive, including in Bangladesh, Viet Nam and Nigeria (Zezza & Tasciotti, 2010). These results could justify policy or programs stimulating urban agriculture as a food system innovation for better nutrition.

### *3.2.3. Food environment – Technology*

***Storage and cold chain innovations*** are a first type of food system innovations in the domain of technology in the food environment. In Viet Nam, where increasing numbers of households own refrigerators, Heard et al. (2020) show that refrigerator ownership causes a reduction in per capita calorie intake and a switch from consuming food groups with low nutrient density (starchy staples), to food groups with high nutrient density (mainly dairy products). Surprisingly, consumption of fleshy food, fruits, vegetables and nuts decreases with refrigerator ownership. A qualitative study describes how fridge freezers in Hanoi, Viet Nam, fit into shopping patterns that, on the one hand, rely on local food sources in nearby rural areas, which are better trusted for food safety, and on the other hand rely on supermarkets as a convenient outlet for fresh produce, dairy and snacks (Rinkinen et al., 2019). Otherwise, there is no evidence of cold chains innovations in the focus countries. In Ethiopia, a qualitative study of community-based grain banks, where women produce complementary food for infants and young children, points out that there is limited awareness of the need for complementary feeding. But it shows that caregivers of children who use the locally produced complementary food appreciate the low price, local sourcing, and quality of the product and perceive positive effects on children's weight and health (Roche et al., 2017).

***Fortified foods or fortified food supplements***, offered without consumer choice, are classified here as a second type of technological innovation in the food environment.[4] There are several rigorous, high-

[4] When consumers have a choice about consuming the fortified food (supplement) on offer we classify it under technological innovations targeted at consumer behaviour.

quality experimental studies of efficacy of different types of fortified foods. These report a positive impact on nutritional outcomes of young children in Ethiopia (Aboud et al., 2017), of primary school children, adolescents and the general population in Bangladesh (Adams et al., 2017; Hotz et al., 2015; Hyder et al., 2007; Sazawal et al., 2013), of primary school children in Nigeria (Aaron et al., 2011), and, in Viet Nam, of pre-school children (Tran T. Nga et al., 2013), primary school children (Le et al., 2007; Lien et al., 2009; Tran Thuy Nga et al., 2009), and adult women (Casey et al., 2011, 2017; Van Thuy et al., 2005). Wheat flour *chapatti* (flat bread) fortified with micronutrients only reduced vitamin A deficiency in school-aged children in rural households in Bangladesh (Rahman et al., 2015). A systematic review of iron or steel cooking pots as a technologic innovation to add bioavailable iron to food during preparation, including evidence from Ethiopia and Viet Nam, shows mixed results on haemoglobin concentration (Hb) and iron status (serum ferritin (SF)) in women, adolescent girls, and infants (Alves et al., 2019).

One study examined consumer appreciation and willingness-to-pay for fortified food items in Senegal and showed that men's and women's willingness-to-pay differs with and without prior information and depending on whether food is fortified with chemical or natural micronutrients (De Groote et al., 2018). Another study observed that some consumers in Nigeria are reluctant to try novel foods, such as naturally-fortified drinks (Idowu-Adebayo et al., 2020). Assessments of marketing and selling with private sector involvement of some of the fortified foods assessed for their efficacy are included in the section discussing innovations in the domain of institutions in the food environment (Section 3.2.2).

#### *3.2.4. Consumer behavior – Policy / Regulation*

A first type of policies and regulations targeting consumer behavior includes ***unhealthy food taxes and healthy food subsidies***. One study uses estimated price and expenditure elasticities to project reduced consumption of sugar-sweetened beverages in Viet Nam as a result of a 10 percent tax (Luong & Vu, 2020). Otherwise, there is no evidence for the focus countries as unhealthy food taxes or healthy food

subsidies have not been established. However, there are several before-after studies of taxes on unhealthy foods implemented as a nationwide policy, all of them in Latin America (Batis et al., 2016; Caro et al., 2018; Colchero et al., 2016, 2017; Nakamura et al., 2018; Ng et al., 2019; Teng et al., 2019). Such taxes are generally successful in changing consumption patterns to include lower proportions of food with high sugar, salt, and/or fat content. There is no evidence of impact of healthy food subsidies. One study for Egypt shows that low prices of subsidized energy-dense food items are associated with higher BMI of mothers (Asfaw, 2007). For Viet Nam, Schram et al. (2015) show that liberalization of trade and foreign direct investment following accession to the World Trade Organization in 2007 substantially increased sales of sugar-sweetened carbonated beverages.

Even if ***cash and in-kind transfers*** are not necessarily aiming to improve diets or nutrition, we included these as a type of policy influencing consumer behavior, mainly through altering budget constraints. Relatively many high-quality quasi-experimental studies have assessed the impact on children's and women's diet quality and nutrition outcomes. The evidence of their impact on children's nutrition is mixed for Ethiopia (Berhane et al., 2017; Debela et al., 2015; Porter & Goyal, 2016; UNICEF MOLSA & IFPRI, 2020), as well as for Bangladesh (Ahmed et al., 2007; Mascie-Taylor et al., 2010). In Bangladesh, when food or cash transfers to mothers are accompanied by nutrition behavioral change communication, children are more likely to consume micronutrient supplements (Hoddinott et al., 2018). Cash transfers with nutrition behavioral change communication had a large impact on young children's height-for-age, through improved diets and reduced illness (Ahmed et al., 2019). The evidence of their impact on women's nutritional outcomes is positive in Bangladesh (Ahmed et al., 2007; Mascie-Taylor et al., 2010). A nutrition-sensitive cash transfer program in Ethiopia, however, had no effect on women's diet quality (UNICEF MOLSA & IFPRI, 2020). In Viet Nam, social allowances (to the poor) shifted consumption patterns to include more non-rice food items, but pensions for retired people did not (Cuong, 2013). Humanitarian and resilience-building assistance to conflict affected communities in north eastern Nigeria using food- and cash-for-work nutrition advisory services targeted at women improved household diet

diversity (Nkonya et al., 2019). A low-quality study for Nigeria found a positive association between vouchers for internally displaced persons and households' diet diversity (USAID, 2018).

#### *3.2.5. Consumer behavior – Institutions*

We next discuss food system innovations targeting consumer behavior in the domain of institutions. The first type is ***women's empowerment,*** which is an institutional change that has not necessarily been introduced as an innovation in the reviewed studies. But if its impact proves positive, policy, programs, or interventions could consider improving nutrition or diets through women's empowerment initiatives. In Ethiopia, a high-quality quasi-experimental study found positive effects of women's empowerment on diet diversity for children and women (Yimer & Tadesse, 2015). For Ethiopia and Bangladesh, Headey et al. (2017) found that positive trends in children's nutrition co-evolved with improvements over time in aspects of women's empowerment, such as mother's education and reproductive health. A systematic analysis of association between women's empowerment in agriculture and diet diversity of households, women, and young children, and nutrition outcomes for children and women in six countries shows that patterns of association differ by country (Quisumbing et al., 2020). In Bangladesh, women's empowerment is found to be positively correlated with household and women's diet diversity; negatively with women's BMI. A larger empowerment gap between female and male co-heads of households is associated with lower household and women's diet diversity and lower height-for-age z-scores of children under two years of age. A systematic review of studies of the association between women's empowerment and indicators of children's nutrition, which includes 35 studies from South Asia and 26 from sub-Saharan Africa, concludes that there is underwhelming evidence of positive association (Santoso et al., 2019).

***Information campaigns*** form a second type of food system innovation in the domain of institutions that target consumer behavior. Most of the evidence of impact of information campaigns is in Viet Nam and/or Bangladesh. In Viet Nam, nutrition education is found to have a positive effect on primary school

children's nutrition knowledge (Daudt et al., 2018; T. Nguyen et al., 2020). Large-scale media campaigns aiming to reduce salt intake in Vietnam, albeit combined with information campaigns for specific target groups, have been projected to avert a substantial number of disability-adjusted life years capacity (Ha & Chisholm, 2011), and are associated with improved knowledge, reduced consumption of salt, and fewer negative health consequences (Do et al., 2016). In Bangladesh, nutrition education in combination with cooking contests for adults did not change nutrition knowledge nor households' diet quality (Kramer, 2017). A health-focused intervention with women using a participatory learning and action approach improved women's diet diversity and knowledge of ways to maintain good nutrition and prevent anaemia (Harris-Fry et al., 2016). A nutrition-sensitive agricultural intervention with farmer nutrition schools targeted at poor women slightly increased diet diversity of women and children 6–23 months of age, and reduced the incidence of severe stunting (SPRING, 2018). Behavioral change communication workshops improved diversity of food consumed at a subsequent buffet and at home, a plate nudging people to choose well-proportioned and diverse food improved diet diversity at home but not in the buffet (Davidson et al., 2021). In Ethiopia, nutrition education promoting consumption of pulse-based foods is associated with higher pulse consumption among rural women (Yetnayet et al., 2017). In Nigeria, a nutrition education program is associated with improved nutritional knowledge by women (Jatau, 2013). Based on evidence in developed countries, Ayisi Addo and Steiner-Asiedu (2019) argue mobile phone-based weight loss interventions could be a cost-effective way to address overweight and obesity in developing country contexts.

#### *3.2.6. Consumer behavior – Food system innovations working through institutions and technology focused on infant and young children's nutrition*

A substantial number of food system innovations addressing consumer behaviour aim to improve ***infant and young children's nutrition***. In the domain of institutions, we identified information campaigns, and in the domain of technology, we identified programs offering fortified food or fortified food supplements. In some cases, information campaigns are combined with fortified food (supplements).

First, there is a lot of evidence, of varying quality, of ***information campaigns*** specifically targeted to improve nutrition of infants and young children in Ethiopia, each with a slightly different approach, with most targeting mothers, and one targeting mother-father pairs (Moss et al., 2018). Knowledge and children's diets and diet diversity are generally positively affected by information campaigns (Kang et al., 2017a; Tariku et al., 2015) or at least positively associated with information campaigns (Kim et al., 2016; Moss et al., 2018; J. White & Mason, 2012). Some campaigns positively affect children's anthropometrics (Kang et al., 2017b) or are positively associated with them (J. White & Mason, 2012), others not (Fenn et al., 2012; Kim et al., 2016). Intensified with community mobilization, a nutrition-sensitive agricultural program that includes interpersonal and mass media nutrition information campaigns improved children's dietary diversity and anthropometrics (Kim et al., 2019). A systematic review of nutrition education or counselling promoting complementary feeding in LMICs, including Bangladesh, Ethiopia, and Viet Nam, concludes these have small but significant impacts on linear growth of young children in food-secure populations (Panjwani & Heidkamp, 2017).

In Bangladesh, weekly child nutrition sessions for caregivers are found to have improved the weight of young children (Shi & Zhang, 2011). Also in Bangladesh, children's anthropometrics appear unaffected by a nationwide children's nutrition program implemented between 1996 and 2002 (Hossain et al., 2005; Levinson et al., 2005; Sack et al., 2005), partly through ineffective targeting and limited practice change on the part of mothers, despite improved nutrition knowledge (White & Masset, 2007). Behavioral change communication, combined with demonstrations of preparation of complementary foods and community mobilization involving men, improved complementary feeding practices and anthropometrics of infants and young children (Swapan Kumar Roy et al., 2007). An intensive behavioral change campaign, including community mobilization and a mass media campaign in addition to interpersonal counselling and home visits, increased mothers' diet diversity and food expenditures, which increased consumption of eggs, fish and meat by infants and young children (Warren et al., 2020). A parenting program focused on

children's health, nutrition, and development did not change child growth but did improve complementary feeding practices (Aboud et al., 2013), as did an intensive behavioral change campaign (Menon et al., 2016), also in the longer term (Kim et al., 2018). Peer counselling improved complementary feeding practices and linear growth of infants and young children in urban slums in Bangladesh (Ara et al., 2019a). Nutrition education, as part of in an integrated water, sanitation and hygiene (WASH) and nutrition behavioral change campaign, reduced snack and sugar-sweetened beverage consumption by young children, even at a longer term (Jannat et al., 2020).

In Viet Nam, when mothers attend at least one session, intensive versus non-intensive interpersonal communication for infant and young child nutrition, combined with community mobilization and mass media, is more effective at improving child feeding practices (P. H. Nguyen et al., 2014; Rawat et al., 2017). A quasi-experimental study of a community-based information and feeding program showed increased child nutrition knowledge among mothers, improved diet diversity for boys up to two years of age, but no improvements in children's anthropometrics, except among infants (Rana et al., 2018). In Nigeria, education on nutrition and (staple crop) farming technologies targeted at women is associated with better children's nutrition outcomes (Lawal & Jibowo, 2006). In Malawi, where men were included in cooking demonstrations, men's awareness about child nutrition was perceived to have improved as well (Kerr et al., 2016).

Second, in some cases, ***information campaigns*** to improve infant and young children's nutrition are ***combined with fortified food, fortified complementary feeding or fortified food supplements***. Experimental assessments in Bangladesh show positive effects on the nutritional outcomes of infants and young children (Aboud & Akhter, 2011; Christian et al., 2015; Stewart et al., 2019), and malnourished young children (Roy et al., 2005). A program combining food rations to children, WASH, and interventions to empower women and the poor is associated with averting increased stunting prevalence of young children (Smith et al., 2013). In Ethiopia, a nutrition-sensitive chicken rearing project improved

young children's anthropometrics after 18 months, in combination with behavioral change communication (BCC) after 9 months (Passarelli et al., 2020). Another nutrition-sensitive chicken rearing project is associated with higher egg and eggshell powder consumption by young children (Omer et al., 2018). Nutrition education programs promoting local barley and maize for complementary feeding is associated with improved mothers' knowledge and children's diet diversity (Negash et al., 2014). Nutrition education promoting pulses for complementary feeding had positive effects on mothers' knowledge, attitudes and practice, children's diet diversity and nutrition outcomes (Teshome et al., 2020). For Nigeria, there is no evidence that a program combining micronutrient supplementation and community-based management of acute malnutrition is associated with changed anthropometrics of young children (Hansford et al., 2017). A systematic review of complementary food supplementation interventions with or without nutrition education in LMICs, including Bangladesh, Ethiopia, and Viet Nam, found these have small significant effects on linear and ponderal growth of young children in food-insecure settings (Panjwani & Heidkamp, 2017).

Third, some programs offer ***fortified (complementary) food or fortified food supplements*** with the aim to improve infant and young children's nutrition. A systemic review, including evidence from Bangladesh, Ethiopia, and Viet Nam shows generally positive effects on young children's anthropometrics and anaemia (Tam et al., 2020). Quasi-experimental studies demonstrate that complementary feeding fortified with micronutrient powders had positive impacts on young children's anthropometrics in Ethiopia (Samuel et al., 2018) and in Bangladesh (Dewey et al., 2018; Mahfuz et al., 2020). It is associated with a lower prevalence of stunting in young children in cyclone-affected areas in Bangladesh (Rah et al., 2011). Lipid-based nutrient supplements (Das et al., 2019) and formula- and food-based animal protein supplementation (Pimpin et al., 2019) generally have positive effects on young children's anthropometrics, including in Bangladesh. In Viet Nam, a combined iron–zinc supplementation had a positive effect on iron and zinc status in infants but not on anthropometrics (Berger et al., 2006). Daily multiple micronutrient supplements, as compared to weekly or single-nutrient supplements, perform best

for weight gain and reducing anaemia and micronutrient deficiency in infants (Smuts et al., 2005). Compared to home-made complementary foods, high-energy dense fortified gruels improved infants' linear and ponderal growth in the short term, but less convincingly so in the longer term (Phu et al., 2012; Van Hoan et al., 2009).

In Bangladesh, children's acceptability of food fortified with micronutrient powders, which are locally produced and marketed in a nonprofit-private sector partnership (discussed in Section 3.2.2. on private sector initiatives in marketing fortified foods), was perceived to be less than when enhanced with chickpeas or lentils (T. Ahmed et al., 2014). The use and regularity of use of these micronutrient powders by caregivers, however, is limited and hampered by lack of information and irregular supply (Sarma et al., 2016). Where there are programs building awareness and capacity for infant and young child feeding, mothers are more knowledgeable about the micronutrient powders and purchase it more regularly (Afsana et al., 2014). Willingness-to-pay studies in Ethiopia (Segrè et al., 2015) and Bangladesh (Cummins et al., 2018) show subsidies would be needed for caregivers to adopt lipid-based nutrient supplements and micronutrient powders for infants and young children. In Nigeria, a feasibility study concluded that acceptability and correct use by caregivers who received micronutrient powders was relatively high (Korenromp et al., 2016).

### 3.3. Considerations of gender and gender equity

In this section, we discuss the extent to which gender and gender equity is considered in food system innovations and their evaluations included in this inventory.

First, we discuss gender aspects of the food system innovations. Of the 150 studies reviewed, 65 concern a gender blind intervention or policy and applied a gender blind analysis of impact. Only four concern gender transformative food system innovations, all of them information campaigns focused on infant and young children's nutrition, with three in the focus countries of Viet Nam, Nigeria, and Bangladesh (Smith

et al., 2013; Kerr et al., 2016; Hansford et al., 2017; and Rana et al., 2018). Two other information campaigns that focused on infant and young children's nutrition, one in Ethiopia (Worku et al., 2020) and one in Bangladesh (Stewart et al., 2019), are gender accommodating as they include female and male caregivers.

A total of 33 interventions in our review targeted mothers to improve infant and young children's nutrition. This is based on a hypothesis that mothers and female caregivers have a greater role in decision-making with regard of children's nutrition but risks increasing women's work burdens and responsibilities and consolidating gender roles. Most are campaigns providing information and/or fortified food (supplements) in Ethiopia[5] and Bangladesh[6]. Three are in Viet Nam (Nguyen et al., 2014; Panjwani & Heidkamp, 2017; Rawat et al., 2017), and two in Nigeria (Lawal & Jibowo, 2006; Korenromp et al, 2016). Other interventions targeting mothers include (storage for) local production of fortified food in Viet Nam (Rocha et al., 2018a, and Rocha et al., 2018b) and Ethiopia (Roche et al., 2017), and a multi-sectoral nutrition-sensitive agricultural program (Ryckman et al., 2019).

In nine studies, women are targeted or women's empowerment is addressed because of their instrumental role in household and child nutrition. One concerns cash transfers in Ethiopia (UNICEF MOLSA & IFPRI, 2020), two cash and in-kind transfers in Bangladesh (Hoddinott et al., 2018; Ahmed et al., 2019), and one supermarket shopping by women in Viet Nam (Wertheim-Heck and Raneri, 2020), while five examine the role of women's empowerment.[7]

[5] These studies include Fenn et al. (2012), Negash et al. (2014), Tariku et al. (2015), Kim et al. (2016), Kang et al. (2017a), Kang et al. (2017b), Panjwani & Heidkamp (2017), Samuel et al. (2018), Kim et al. (2019), Passarelli et al. (2020), and Teshome et al. (2020).

[6] These studies include Roy et al., (2005), Hossain et al. (2005), Roy et al., (2007), Aboud & Akhter (2011), Shi & Zhang (2011), Aboud et al. (2013), Ahmed et al. (2014), Menon et al. (2016), Panjwani & Heidkamp (2017); Kim et al. (2018); Ara et al. (2019), and Warren et al. (2020).

[7] These studies include Yimer & Tadesse (2015), Headey et al. (2017), Nisbett et al. (2017), Santoso et al. (2019), and Quisumbing et al. (2020).

In acknowledgement of potential gender-specific vulnerabilities to malnutrition, nine programs have a focus on women's nutrition. They include interventions of institutional purchasing (Hossain et al., 2019), fortified foods (Hyder et al., 2007; Casey et al., 2011; Casey et al., 2017), cash and food transfers (Ahmed et al., 2007), information campaigns (Jatau, 2013; Harris-Fry et al., 2016; Kramer, 2017; Yetyanet et al., 2017), and nutrition-related national policy (Vanderkooy et al., 2019).

Second, we look at considerations of gender in the analysis of impact of the food system innovations. Of the 150 reviewed studies, only 16 apply a gender-disaggregated analysis of intervention impacts. The interventions include nutrition labelling in Ethiopia (Bekele et al., 2016), a school nutrition program in Viet Nam (Hall et al., 2007), fortified food in Senegal (De Groote et al., 2018), an information campaign combined with nudging in Bangladesh (Davidson et al., 2021), an information campaign in Malawi (Kerr et al., 2016), and cash transfers in Bangladesh (Ahmed et al., 2007) and Ethiopia (Debala et al., 2015; Berhane et al., 2017). Impact on children's nutrition disaggregated by children's gender is assessed for the case of women's empowerment in six countries including Bangladesh (Quisumbing et al., 2020), supermarket shopping in Kenya (Debala et al., 2020) and Viet Nam (Berger et al., 2006; Rana et al., 2018). Gender-transformative and gender-accommodating programs tend to be evaluated using a gender-disaggregated analysis (Kerr et al., 2016; Rana et al., 2018; Stewart et al., 2019).

A total of 19 studies adopted a so-called gender-aware analysis of impact, controlling for sex of (child) beneficiaries. Apart from nutrition education and/or fortified food campaigns for infant and young children, they concern supermarket shopping in Kenya (Demmler et al., 2018), fortified food or beverages in Bangladesh, Viet Nam, and Nigeria (Le et al., 2007; Rahman et al., 2015; Adams et al., 2017; Idowu-Abedayo et al., 2020), effects of cash transfers on child nutrition in Ethiopia and Bangladesh (Porter & Goyal, 2016; Ahmed et al., 2019), and nutrition-sensitive agricultural programs in Ethiopia and Bangladesh (SPRING, 2018; Ryckman et al., 2019).

Twelve studies considered impact on women or girls only. The interventions include food subsidies in Egypt (Asfaw, 2007), cash transfers in Bangladesh (Mascie-Taylor et al., 2010), institutional purchasing in Bangladesh (Hossain et al., 2019), fortified foods in Bangladesh and Viet Nam[8], information campaigns in Bangladesh, Ethiopia and Nigeria (Jatau, 2013; Harris-Fry et al., 2016; Yetnayet et al., 2017), and a child nutrition information campaign in Ethiopia (Moss et al., 2018; Worku et al., 2020). One study looks at the relationship between women's empowerment and women's diet diversity, as well as sex-specific child nutrition outcomes (Quisumbing et al., 2020). Some of the studies that consider impact on women or girls concern gender-blind interventions (Van Thuy et al., 2005; Asfaw, 2007; Mascie-Taylor et al., 2010; Hotz et al., 2015), others are targeted at women or girls[9], and one intervention is gender-accommodating (Moss et al., 2018; Worku et al., 2020).

### 3.4. Evidence gaps

Our inventory of evaluations of potential food system innovations and the evidence map pointed out there is limited evidence on most types of food system innovations in the focus countries, except maybe for information campaigns and fortified foods, albeit in combination, targeted to improve nutrition of infants and young children.

Some types of food system innovations face substantive evidence gaps. Overall, we identified relatively few studies providing evidence of effects of nutrition-relevant national policy, healthy food subsidies, storage and cold chain innovations, and healthy street food. While we identified some descriptive studies, rigorous evaluations of food system innovations initiated by or with involvement of the private sector are limited. Yet, in reality there are quite a number of anecdotal examples of private sector-initiated food system innovations such as, for instance, food delivery services, e-commerce, or technological innovations such as food products with lower fat content, with added vitamins or nutrients or sugar-free products, including in urban environments in the focus countries. The challenge is that private sector-

[8] These studies include Van Thuy et al. (2005), Hyder et al. (2007), Casey et al. (2011), Hotz et al. (2015), and Casey et al. (2017).

[9] These studies include Hyder et al. (2007), Casey et al. (2011), Jatau (2013), Harris-Fry et al. (2016), Yetyanet et al. (2017), Casey et al. (2017), and Hossain et al. (2019).

initiated food system innovations are not systematically evaluated, and, if they are evaluated, such evaluations are typically not done rigorously, and results are not necessarily published.[10] As discussed above, there is very limited evidence of gender accommodating and gender transformative food system innovations.

In terms of evidence gaps specific to the focus countries, our inventory reveals there is little evidence of impact of nutrition labelling policy and packaging innovations, healthy street foods, and unhealthy food taxes. Except for Viet Nam, there is also an evidence gap on supermarket shopping. As compared to the other focus countries, we found relatively few evaluations of food system innovations in Nigeria; this finding is consistent with the 3ie Food Systems and Nutrition Evidence Gap Map (3IE, 2021). For Nigeria, there are evidence gaps on effects of supermarkets and retail innovations, institutional purchasing, storage and cold chain innovations, cash and in-kind transfers, women's empowerment, and information campaigns both for the general population and for infants and young children.

Our inventory also revealed some evidence gaps in terms of analysis of the impact of potential food system innovations. First, while by definition food system innovations should have dynamic effects within the food system, changes across the food system are generally not assessed and few studies simultaneously look at effects in the food environment and effects in the area of consumer behavior. Exceptions in our inventory include evaluations of nutrition labelling[11], unhealthy food taxes (Caro et al., 2018; Nakamura et al., 2018; Teng et al., 2019), and studies of complementary and fortified food (supplements) locally produced in inclusive business models in Ethiopia, Bangladesh, and Viet Nam.[12]

[10] Personal communication with Linnemann, A. (25/11/20); Ingenbleek, P. (10/11/20); Lane, C. (15/01/21).

[11] These studies include Shangguan et al. (2019), Croker et al. (2020), Quintiliano Scarpelli et al. (2020), and Taillie et al. (2020).

[12] These include Ahmed et al. (2014), Roche et al. (2017), Agnew & Henson (2018), Rocha et al. (2018a, 2018b), and Danse et al. (2020).

Second, most evaluations of food system innovations in our inventory assess effects on a particular stage along the pathway of change, as confirmed by the 3ie Food Systems and Nutrition Evidence Gap Map (3IE, 2021). Some evaluations focus on effects of interventions on different stages along the pathway of change, albeit in different publications. For example, Passarelli et al. (2020) show the impact of nutrition-sensitive introduction of chicken husbandry combined with BCC on children's nutrition outcomes and intermediary outcomes such as egg consumption, dietary diversity, and women's empowerment. In other cases, studies that assess effects in the last stages along the pathway of change, for instance on anthropometrics, do not necessarily assess effects on change in earlier stages. Some studies that assess effects in the first stages along the pathway of change, for instance on awareness about healthy diets, project potential change in diet quality or nutrition outcomes, else it is implicitly assumed. The lack of evidence of impact at different stages hinders inference about the pathway of change.

Third, the question of whether the effects of food system innovations are sustainable over time is hardly addressed. There are only six examples of interventions with follow-up studies.[13] The interventions concern the multi-sectoral nutrition sensitive Feed the Future initiative, unhealthy food tax, two that look at fortified food supplements, and two on BCC for infant and young child nutrition.[14] A fourth observation, shared by the 3ie Food Systems and Nutrition Evidence Gap Map, is that hardly any study includes an analysis of cost-effectiveness (3ie, 2021). Exceptions in our inventory include S. Ahmed et al. (2020), Casey et al. (2011), Ha and Chisholm (2011) and Swapan Kumar Roy et al. (2007).

As discussed in Section 3.3., while there is ample evidence that challenges of malnutrition – including undernutrition, micronutrient deficiencies, overweight in children and adult populations - are gender-specific in many cases (Ameye & Swinnen, 2019; Haddad et al., 1996; Klasen, 1996; Nubé & Van Den Boom, 2003; WHO, 2017), only about 10 percent of the reviewed studies provided gender-disaggregated evidence of impact. Furthermore, while there is ample evidence of impact specifically for infants, young

[13] Some studies may have been preceded by evaluations conducted prior to 2005, which are not included here.

[14] These studies include Casey et al. (2011), Phu et al. (2012), Colchero et al. (2016), Menon et al. (2016), Casey et al. (2017), Colchero et al. (2017), Kim et al. (2018), Ryckman et al. (2019), and Jannat et al. (2020).

children, and children, we did not come across evidence of impact disaggregated for youth, adult, and elderly population groups.

A final observation is that 80 percent of the studies that report results show positive impacts or positive associations with nutrition and diet related outcomes. Only about 5 percent report negative impacts or association, 5 percent mixed evidence, while about 10 percent report insignificant results. The question could arise whether the available evidence has been subject to publication bias.

### 3.5. Potentially promising food system innovations

From the evidence in our inventory, some types emerge as potentially promising food system innovations for the focus countries' contexts. First, nutrition-relevant, multi-sectoral national policy, spanning across different relevant policy areas, including health, agriculture, and social protection, and backed by high-level political commitment to nutrition, can lead to promising innovations within the food system, provided that insufficient human and financial resources and inadequate coordination do not hinder implementation on the ground (Nisbett et al., 2017; Warren & Frongillo, 2017; Vanderkooy et al., 2019). To be a potentially promising food system innovation, the focal points in nutrition-relevant national policy should be adapted to address the specific challenges of malnutrition, the stage of food systems, and drivers of food systems in the country in question.

Policy that makes nutrition labelling compulsory is a second type of food system innovation with potential in the domain of policy influencing the food environment. Although there is no evidence for the focus countries, where such policies are implemented, dynamics in the food environment generate greater supply of healthier products (Croker et al., 2020; Quintiliano Scarpelli et al., 2020; Taillie et al., 2020) and consumers adopt consumption patterns in favor of healthier diets (e.g. Massri et al., 2019; Taillie et al., 2020; Ares et al., 2021). The effects on supply and consumption patterns, however, are small but implementing such policies is likely to be relatively inexpensive. Such types of food systems innovations

are likely to be most fit for countries that face high or increasing consumption of unhealthy food items or with high content of unhealthy elements. The focus countries Viet Nam and Nigeria, with relatively high and increasing prevalence of obesity and overweight, particularly in urban populations, and mixed food systems could be settings where compulsory nutrition labelling could become a relevant food system innovation (Morgan & Fanzo, 2020; Posthumus et al., 2019; Raneri et al., 2019).

A third type of food system innovation in the food environment that may be promising is institutional purchasing. Providing healthy meals or snacks in school or factory environments generally has a positive impact on awareness of healthy diets, better consumption patterns, and nutrition outcomes of the target group, which, in the reviewed studies, included school children and adult women. While this concerns evidence of pilot studies, if at scale such interventions could have positive impacts in wider populations of children and employees. The studies reviewed here, however, did not assess whether consumer behavior and consumption patterns were changed beyond the school or factory environment. Nguyen et al. (2020), while hypothesizing that school children would pass on nutrition knowledge to their parents, for instance, found little effect of the combined healthy snacks and nutrition education on parents' knowledge. Institutional purchasing and providing healthy and nutritious meals in schools could be useful food system innovations both in contexts where challenges of malnutrition mainly concern undernutrition and nutrient deficiencies, for instance in countries such as Ethiopia and Bangladesh (de Brauw et al., 2020; Gebru et al., 2018), and where unhealthy diets cause overweight and obesity, for instance in urban Viet Nam and Nigeria (Morgan & Fanzo, 2020; Posthumus et al., 2019; Raneri et al., 2019).

The efficacity of fortified foods offered to the general population or target populations including women or school-aged children generally prove positive for nutrition outcomes. If these can be offered or sold in a durable or commercially viable way to the target consumers, they could be interesting food system innovations, particularly for addressing micronutrient deficiencies. Experiences of marketing such fortified foods with private sector involvement, however, have illustrated the challenges of reaching rural

areas and poorer sections of the population. Hence, this type of food system innovation may be most fit for urban environments with denser retail networks and consumers with more purchasing power.

Potentially promising food system innovations influencing consumer behavior include policies introducing unhealthy food taxes. There is no evidence for the focus countries, but, where implemented, such taxes make unhealthy food somewhat more expensive (Caro et al., 2018; Nakamura et al., 2018; Teng et al., 2019) and have comparable effects on consumption patterns as mandatory nutrition labelling (e.g. Colchero et al., 2016; Batis et al., 2016; Teng et al., 2019). As with nutrition labelling policies, effects are relatively small but introducing unhealthy food taxes is likely to be inexpensive. And similar to compulsory nutrition labelling, unhealthy food taxes seems most appropriate for contexts with high or increasing consumption of unhealthy food items.

Information campaigns addressing consumer behavior may be promising food system innovations as well. Large-scale information campaigns raising awareness about specific unhealthy food items that include multiple channels, including mass media, to reach the general population and specific target groups appear successful in changing people's awareness and capacity to adopt healthier diets and improving nutrition and health outcomes. This was evident from a large-scale awareness-raising campaign about salt in Viet Nam (Ha et al., 2011; Do et al., 2016). Yet, such large-scale campaigns are time- and resource-intensive, and therefore likely to be costly to scale up or implement for wider ranges of unhealthy foods and behavior. Besides, such food system innovations seem only relevant in contexts with a high consumption of unhealthy food items and high prevalence of related non-communicable diseases, such as Viet Nam and urban Nigeria (Morgan & Fanzo, 2020; Posthumus et al., 2019; Raneri et al., 2019). Campaigns addressing nutrition for infants and young children that provide information and fortified food (supplements), albeit in combination, prove generally effective in improving children's nutritional outcomes or diet quality in Bangladesh, Ethiopia, and Viet Nam. This type of food system innovation is particularly promising for addressing challenges of undernutrition and micronutrient deficiencies, which

are still common in countries with traditional food systems, such as Ethiopia and Bangladesh (de Brauw et al., 2020; Gebru et al., 2018), or in rural or poor urban contexts of countries with mixed food systems, such as Viet Nam and Nigeria (Morgan & Fanzo, 2020; Posthumus et al., 2019; Raneri et al., 2019). Such information campaigns, however, are often implemented in the framework of donor-funded interventions in specific target areas and tend to be time- and resource-intensive. Questions may arise about sustained impact after the intervention and about the potential of LMICs to sustainably fund and implement such campaigns at scale.

Finally, evidence, particularly for Ethiopia and Bangladesh, demonstrates the positive role of women's empowerment for women's and children's diet and nutrition (Yimer & Tadesse, 2015; Headey et al., 2017; Quisumbing et al., 2020) and the positive effects of targeting caregivers, mothers in most cases, with information to improve the nutrition of infants and young children (e.g. Fenn et al., 2012; Kang et al., 2017; Samuel et al., 2018).

Gender dynamics and women's empowerment have been acknowledged to play an important role in achieving nutrition impact (A4NH, 2015). In the Global Gender Gap Index 2018 the focus countries' ranking is lowest for Nigeria, followed by Ethiopia, Viet Nam, and Bangladesh (World Economic Forum, 2018). While different, each country face challenges with gender equality and women's empowerment (de Brauw et al., 2020; Gebru et al., 2018; Posthumus et al., 2019; Raneri et al., 2019). Therefore, even if time- and resource-intensive, promoting women's empowerment and targeting women with nutrition information could be effective food system innovations addressing consumer behavior. However, there is a risk of emphasizing the instrumental value of women's empowerment for household and child nutrition over its intrinsic value and a risk of adding on to an already heavy responsibility and work burden on the part of women (Chant, 2008; Molyneux, 2006). Furthermore, reflection may be needed about potentially reinforcing gender roles, consolidating women's roles as caregivers, and potentially generating unintended negative consequences of prioritizing women, including backlash from men or the community

(Bhalotra et al., 2020; Cools & Kotsadam, 2017; Heath, 2014; Komatsu et al., 2018; Mayoux, 2001). Finally, targeting women to address household and child nutrition relies on the assumptions that women are the most knowledgeable, the ones responsible, and the ones with effective decision-making power about diets and nutrition of the household and children. Such assumptions may not always be realistic (Malapit et al., 2019; Quisumbing et al., 2020; Santoso et al., 2019).

# IV. DISCUSSION

To address malnutrition in LMICs, more evidence is needed of the potential of food system innovations to help guide the transformation toward healthier, more sustainable, and equitable food systems. We conducted a systematic search and review of evidence of the impact of different types of food system innovations in the food environment and innovations addressing consumer behavior on diet and nutrition-related outcomes. We included evidence primarily for Bangladesh, Ethiopia, Nigeria, and Viet Nam, the four focus countries of A4NH, which provide a range of diet and (sub)-national food system contexts at various stages of food system transformation and urbanization. We also examined the extent to which there is evidence of food system innovation potential to reduce gender discrepancies in healthy diets and malnutrition. We summarized the findings per type of food system innovation in an evidence map and a narrative. We identified evidence gaps in terms of food system innovation types and in terms of impact analysis, and identified potentially promising food system innovations.

Based on our systematic search and review, potentially promising food system innovations in the food environment to promote healthier diets and nutrition in the contexts of the A4NH focus countries include nutrition-relevant multi-sectoral national policy backed with means for effective implementation, and institutional purchasing through which healthy meals or snacks are offered in school or factory environments. The latter could be useful food system innovations both in contexts with challenges of undernutrition and nutrient deficiencies and where unhealthy diets risk causing overweight and obesity. Based on evidence for other LMICs, compulsory nutrition labelling is shown to promote supply of healthier products and healthier consumption patterns. Effects are relatively small but may be attained at relatively low cost. Compulsory nutrition labelling would be most appropriate in contexts with high or increasing consumption of unhealthy food items or with high content of unhealthy elements. Fortified foods could be interesting food system innovations to address micronutrient deficiencies, if these can be durably offered or viably commercialized, which seems more feasible in areas with dense retail networks and consumers with sufficient purchasing power.

Potentially promising food system innovations influencing consumer behavior include large-scale information campaigns targeted at the general population that raise awareness about specific unhealthy food items, such as salt, in contexts with high consumption of unhealthy food items and high prevalence of related noncommunicable diseases. Information campaigns that provide information and/or fortified food (supplements) to address nutrition of infants and young children may be potential food system innovations, mainly appropriate facing challenges of undernutrition and micronutrient deficiencies. The time- and resource-intensity of information campaigns, however, may be an impediment to durable upscaling of such campaigns. In other LMICs, effects and costs of unhealthy food taxes are similar to those of compulsory nutrition labelling. Finally, the positive role of women's empowerment for women's and children's diets and nutrition is demonstrated particularly for Ethiopia and Bangladesh. But each of the A4NH focus countries faces challenges with gender equality and women's empowerment. Promoting women's empowerment and targeting women with nutrition information could be effective food system innovations addressing consumer behavior, despite their time- and resource-intensity. Yet, deliberation is needed about the risks of emphasizing merely the instrumental role of gender equity and women's empowerment for nutrition, reinforcing gender roles, and generating unintended negative consequences for women.

With the cautionary note that our systematic search and review may not be exhaustive, we conclude that, apart from information campaigns and fortified foods for infants and young children's nutrition, there is a dearth of evidence on most types of food system innovations in the A4NH focus countries. Some types of food system innovations face substantive general evidence gaps, including nutrition-relevant national policy, healthy food subsidies, storage and cold chain innovations, and healthy street food. Rigorous evaluations of food system innovations initiated by or with involvement of private sector are limited. There is very limited evidence of gender accommodating and gender transformative food system innovations. Evidence gaps specific to the focus countries include nutrition labelling policies and

packaging innovations, supermarket shopping, healthy street foods, and unhealthy food taxes. There is relatively little evidence, specifically high-quality evidence, of impact of any type of food system innovation in Nigeria. Potential dynamic effects within the food system are generally not assessed. In many cases, evaluations of food system innovations do not assess impact on different stages along the pathway of change which hinders inference about the pathway of change. The extent to which food system innovations have impact that is sustainable over time is scarcely examined. Hardly any study includes an analysis of cost-effectiveness. Despite the fact that challenges of malnutrition are gender-specific in many cases, only about 10 percent of the reviewed studies provided gender-disaggregated evidence of impact. In terms of analysis, it is striking that 80 percent of the studies report positive impact or association with nutrition and diet-related outcomes.

The limited evidence of effects along different stages in the pathway of change, of dynamic effects and system-wide changes of food system innovations, of the cost-effectiveness and sustainability of effects over time encumbers assessing whether a policy or regulation, an institutional process, a change in knowledge, a technology, or an intervention qualifies as a food system innovation. Even based on an analytical understanding of interactions within a food system (de Brauw et al., 2019: 2), it remains challenging to identify the potential of a policy, program, or intervention to become a food system innovation. It may be worthwhile to reflect upon and define additional specific criteria which can back reasonable assumptions about policy, programs, or interventions becoming food system innovations. It should be acknowledged, however, that potential of becoming food system innovations may be context- or country-specific. Possibly, learning about success and failure in different contexts could provide insights into preconditions for particular policies, programs or interventions to become food system innovations. Alternatively, combining analyses per qualification criterium for food system innovations, albeit in a specific country, could inform whether a policy, program or intervention has that potential. For example, our inventory includes efficacy studies of fortified food which answers the question whether it improves diets and nutrition. Willingness-to-pay studies can inform the question whether there is a

potential demand. Our inventory also includes case studies of inclusive business models that address the questions of whether there is a genuine and stable demand for fortified food products and whether it can be sustainably supplied, albeit in a non-for-profit or for-profit business case. Such case studies may allow an assessment of scalability as well, and provide insights of whether policies, programs or interventions will require incentives for lasting change at scale. Follow-up studies, which are, however, limited, can answer the question of whether a supply of fortified foods, albeit with private sector involvement, has lasting effects on diets and nutrition.

Our systematic search and review, which focused on food system innovations in the food environment and innovations addressing consumer behavior, does not enable us to incontrovertibly conclude what would be the best path and the best set of food system innovations for the A4NH focus countries to transform their food systems such that they promote heathier diets in an inclusive way. Our systematic search and review resulted in a substantial amount of evidence of some types of food system innovations for some countries, little evidence for other types of food system innovations, and generally little evidence for the case of Nigeria. The patchy evidence does not provide a solid basis for recommendations of what set of food system innovations one should invest in. Moreover, each LMIC, and each focus country, is characterized by specific diets and (sub)-national food system contexts at various stages of a nutrition transition, food system transformation, drivers of food systems, urbanization and other trends. Therefore, to identify the most appropriate set of food system innovations, as a next step, the results of this systematic search and review should be aligned with the country-specific nutrition challenges, food system challenges, drivers, and trends, as well as with the priorities set by each country, and validated with local stakeholders (Johnson, Wyatt & Nguyen in press).

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# ANNEX: SUMMARY TABLE OF STUDIES INCLUDED IN THE INVENTORY

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Food environment – Policy / Regulations** | | | | | | | | | |
| | **I. Nutrition-relevant policy** | | | | | | | | | |
| V I 0 | ***Harris, J., Nguyen, P. H., To, Q., Frongillo, E. A., & Menon, P. (2016). Progress in improving provincial plans for nutrition through targeted technical assistance and local advocacy in Vietnam. Health Policy and Planning, 31(10), 1333–1341. https://doi.org/10.1093/heapol/czw067*** | Vietnam | 2016 | Decentralisation of nutrition plans to provincial level | General population | Qualitative stakeholder interviews; assessment of the quality of nutrition plans | Changes in the planning processes, content and quality of provincial plans for nutrition and the contribution to such change of the Alive and Thrive (A&T) initiative | Quality of the provincial plans for nutrition (PPNS) improved (evidence-based, include objectives with regard to children's nutrition and health and infant and young child feeding, include multiple sectors). Improvements partly attributed to support by A&T. The planning process of PPNS was not significantly more decentralised. Reduced funding at national level impaired local PPNS. PPNS sometimes rejected when they included objectives outside national nutrition plans. | Gender blind intervention and analysis | X |
| B V + | ***Kessler, J. P., de Jong, F., Jahan, J., Heun, M., Gielen, F., Chowdury, O., & Siddiki. (2017). Evaluation of the Dutch food security programme in Bangladesh. Amsterdam: Aidenvironment. https://english.iob-evaluatie.nl/binaries/iob-evaluatie-eng/documents/sub-studies/2017/10/01/food-security-programme-in-bangladesh-ethiopia-rwanda-and-uganda/Aidenvironment-BRAC-APE_Evaluation_Dutch_Food_Security_Programme_Bangladesh_201702.pdf*** | Bangladesh | 2017 | Sustainable Agriculture, Food Security and Linkages project (SAFAL), integrated value chain development program that included awareness raising about diet diversification | Rural landowning and landless (<0.2 hectares) households in southwest Bangladesh | Difference-in-Difference estimation (Effects of awareness raising about diet diversity cannot be separated from value chain development activities) | Months of adequate food access; food security index (HFIAS); household diet diversity score; nutrition adequacy; stunting and wasting | Project participation is associated with higher number of months with adequate food access among landowning and landless households. There is no relation between project participation and food security index and household diet diversity score in landowning households, but a positive relation with food security index and household diet diversity score in landless households. In participating landowning households, nutrition adequacy did not decrease as much as in non-participating households and in landless households, participation was not related to nutrition adequacy. Project participation is not related to stunting and wasting. | Gender blind intervention and analysis | X |
| B V + | ***Nisbett, N., Davis, P., Yosef, S., & Akhtar, N. (2017). Bangladesh's story of change in nutrition: Strong improvements in basic and underlying determinants with an unfinished agenda for direct community level support. Global Food Security, 13(January), 21–29. https://doi.org/10.1016/j.gfs.2017.01.005.*** | Bangladesh | 2017 | Nutrition specific policy and programming and drivers of nutrition such as women's empowerment, public health, sanitation and poverty reduction | General population (children in particular) | Mixed methods of primary qualitative sources (stakeholder interviews), secondary sources (policy and evaluation documents), statistics | Nutritional status of children (prevalence of stunting, wasting, underweight, overweight); dietary diversity | To ensure food security, rice production augmented at the expense of agricultural and diet diversity. Although better education and incomes led households to purchase a wider variety of food, diet diversity was not improved between 2005 and 2013. Progress in children's nutrition (1997–2014) is correlated with improvements in maternal and reproductive health and child health and improved sanitation (confirmed by statistics), driven by innovations by NGOs coordinated with government, and advanced women's empowerment through education and job access. Economic growth, reductions in poverty and increases in household income are seen as strong drivers of change of nutrition (confirmed by Headey et al. (2015)). There is high level political commitment to nutrition. Impact on the ground is still hampered by delays in roll-out and training and lack of clarity about roles of nutrition and health frontline service delivery. | Instrumental focus on women or women's empowerment (Women's empowerment and maternal health as a driver for children's nutrition) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| E II + | *Warren, A. M., & Frongillo, E. A. (2017). Mid-level actors and their operating environments for implementing nutrition-sensitive programming in Ethiopia. Global Food Security, 13(September 2016), 66–73. https://doi.org/10.1016/j.gfs.2017.01.010* | Ethiopia | 2017 | The implementing mid-level of nutrition sensitive programming | General population (study remote marginal community in Southern Nations, Nationalities, and Peoples Region SNNPR, southwest Ethiopia) | Qualitative (implementing actors in health, agriculture, and social protection below Regional level and households from a community receiving these government services.) | Capacities and constraints of mid-level actors of nutrition sensitive programming; reach and engagement of communities; perceived nutrition related outcomes in communities | Mid-level government actors (at the sub-district or woreda level), those charged with day-to-day management of program implementation, were also the last to receive new information. The top-down approach to information sharing and decision-making implied additional workload, without increasing capacity and ability to deliver feedback to higher levels. Other challenges include little familiarity with nutrition-sensitive programming and multi-sectoral collaboration, high turnover of frontline health personnel, inadequate transportation, and delayed access to budgets. Despite challenges, mid-level actors perceived positive changes in hygiene, food security, community health, vaccination and malaria incidence and women's reproductive health, aided by improved physical infrastructure. Community members perceived non-nutrition programs, such as improved seed and fertilizer, positively impacted households' nutrition. Nutrition advice is not always applicable due to financial and physical constraints, and services by health extension to monitor child growth were inconsistent. Community members mainly saw themselves as recipients, rather than rights owners, of services and advice. | Gender blind intervention and analysis | X |
| E V + | *Ryckman, T., Robinson, M., Pedersen, C., Bhattacharya, J., & Bendavid, E. (2019). Impact of Feed the Future initiative on nutrition in children aged less than 5 years in sub-Saharan Africa: difference-in-differences analysis. BMJ (Clinical Research Ed.), 367, l6540. https://doi.org/10.1136/bmj.l6540* | Multiple countries, including Ethiopia | 2019 | Feed the future: multi-sectoral nutrition sensitive and nutrition specific approaches including initiatives targeting food security and agriculture, agricultural and post-harvest infrastructure, financial services, and private sector engagement, and nutrition specific activities (breastfeeding promotion and micronutrient supplementation, support for women farmers) | Ultimately targets children younger than 5 years; via targeting farmers and women farmers | Difference-in-difference | Stunting prevalence, underweight prevalence, wasting prevalence | Implementation of feed the future is linked to relative statistically significant declines of 5.5 percentage points in stunting prevalence and 4.0 percentage points in underweight prevalence, but not associated with a statistically significant decrease in wasting. These absolute reductions translate into 1.2 and 0.8 annual percentage point declines in stunting and underweight, respectively. The estimated effect sizes correspond to approximately 2.2 million fewer stunted children and 1.6 million fewer underweight children. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| N II + | *Vanderkooy A., Verstraeten, R., Adeyemi, O., Covic, N., Becquey, E., Dogui Diatta, A., Diop, L., Touré, M. (2019). Nutrition Policy in Nigeria, Evidence Note #2, Transform Nutrition West Africa. https://westafrica.transformnutrition.org/wp-content/uploads/2019/07/TN_Nigeria_report_2July-1.pdf* | Nigeria | 2019 | Nutrition-relevant policies in Nigeria | General population (most frequent primary beneficiaries Are children (under 5 and infants) and women (especially Mothers and women at reproductive age) | Screening of policy documents and consultations with regional and in-country experts | Inclusion and attainability of world health assembly targets and indicators (stunting; anaemia in women of reproductive age; low birth weight; childhood overweight; breastfeeding; wasting) | In all policy areas (health, nutrition, agriculture, education/research, water, sanitation, and hygiene, environment, and social), the focus is on undernutrition. Seven policies discuss micronutrient deficiencies. Nine deal with non-communicable diseases, including nutrition related non-communicable diseases. Nutrition indicators are generally a mix of outcome and output indicators of the aforementioned issues, but never at a gender-disaggregated level. Few policies have ways to assess if budget for nutrition is available. Targets are generally as ambitious as world health assembly targets. Indicators are not always formulated for specific targeted populations (e.g. Nutrition of adolescents), for intermediary outcomes (e.g. Exclusive breastfeeding), or to capture disparities (e.g. By income). The importance of multi-sectoral coordination is highlighted across all policies and policy areas. All policies mention monitoring and evaluation and accountability, with most containing a dedicated monitoring and evaluation section or framework. Despite the various nutrition-relevant policies, Nigeria is currently not on-track to meet most of the WHO targets. | Attention for role of both mothers and fathers for child nutrition; Points out lack of attention for gender disaggregated indicators and focus on impact on women's nutrition | X |
| | **II. Nutrition labelling and dietary guidelines** | | | | | | | | | X |
| V I / | *Hop, L. T., Van, T. K., & Thanh, H. K. (2011). Food based dietary guidelines in Vietnam: Progress and lessons learned. Asia Pacific Journal of Clinical Nutrition, 20(3), 495–499. https://doi.org/10.6133/apjcn.2011.20.3.21* | Vietnam | 2011 | Food based dietary guidelines | General population | Summary of guidelines over 3 periods | Food based dietary guidelines | In recognition of increasing challenges of overweight, obesity and non-communicable chronic diseases related to unbalanced diets, in consultation with various stakeholders, a third version of the five-year food based dietary guidelines was developed in 2007. The third version includes recommendations for a proper and balanced diet with moderate fat consumption, reduced meat consumption and increase consumption of fish, vegetables, and fresh fruit in combination with a healthy lifestyle and regular physical activity. Food based dietary guidelines were reported to be developed with the involvement of multi-sectoral organizations. The advice in food based dietary guidelines were communicated by not only health care system but also through grass-root public associations in Vietnam. | Gender blind intervention and analysis | X |
| O III + | *Taillie, L. S., Reyes, M., Colchero, M. A., Popkin, B., & Corvalán, C. (2020). An evaluation of Chile's law of food labeling and advertising on sugar-sweetened beverage purchases from 2015 to 2017: A before-and-after study. PLoS Medicine, 17(2), 1–22. https://doi.org/10.1371/journal.pmed.1003015* | Chile | 2020 | Law regulating food labelling and advertising on sugar-sweetened beverages | Urban Chilean households | Before-after comparison of households' beverage purchases | Volume, calorie and sugar content of beverage purchases | From 2015 to 2017, the mean volume of beverage purchases by urban households with high levels of nutrients of concern (i.e., sugars, sodium, saturated fat, or energy) according to Chilean nutrient thresholds decreased by 22.8 ml/capita/day (-23.7%). The relative change was larger in highly educated than in lowly educated households (-28.7% vs -21.5%) because of lower initial purchases. The mean volume of beverage purchases without high levels of nutrients of concern decreased 4.8%. Calories and sugar from beverage purchases with high levels of nutrients of concern decreased respectively by 11.9 kcal/capita/day and 2.7 g/capita/day. Calories and sugar from total beverage purchases declined respectively by 7.4 kcal/capita/day and 1.7 g/capita/day. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O III + | *Quintiliano Scarpelli, D., Pinheiro Fernandes, A. C., Rodriguez Osiac, L., & Pizarro Quevedo, T. (2020). Changes in Nutrient Declaration after the Food Labeling and Advertising Law in Chile: A Longitudinal Approach. Nutrients, 12(8), 2371. https://doi.org/10.3390/nu12082371* | Chile | 2020 | Law regulating food labelling and advertising on sugar-sweetened beverages | Products from urban Chilean supermarkets | Before-after comparison of food nutritional labelling declarations of 476 products | Proportion of packaged food of which high levels of nutrients of concern (would) require front of package label per nutrient of concern; proportion of packaged food of which high levels of nutrients of concern (would) require front of package label per nutrient of concern per food group; median energy, sugar, saturated fat, sodium declared on front of package label per food group | Between pre-regulation and post-regulation period, the proportion of packaged food of which high levels of nutrients of concern (would) require front of package label (FOPL) for sugar content declined by 15 %. There were also declines in the proportion of flour-based foods and fats and oils of which high levels of energy (would) require FOPL, and the proportion of fats and oils and meat and derivatives of which high levels of saturated fat (would) require FOPL. The proportion of fish and seafood, fats and oils, and spices, condiments and sauces of which high levels of sodium (would) require FOPL declined. For diary, fewer products required the FOPL for high in energy, sugar, and sodium, but more did for saturated fat. For the sugary beverages, fewer products needed the FOPL for high energy and sugar. | Gender blind intervention and analysis | X |
| O III + | *Massri, C., Sutherland, S., Källestål, C., & Peña, S. (2019). Impact of the food-labeling and advertising law banning competitive food and beverages in Chilean public schools, 2014–2016. American Journal of Public Health, 109(9), 1249–1254. https://doi.org/10.2105/AJPH.2019.305159* | Chile | 2019 | Law banning sales of competitive food and beverages (CF&B) in schools | Public school in Santiago de Chile | Before-after comparison of nutrient content on food labels | Percentage of foods exceeding the cut-off levels for calories, total sugars, saturated fat, and sodium defined in the law | From 2014 (pre-regulation) to 2016 (post-regulation), foods exceeding any cut-offs decreased from 90.4% to 15.0%. For solid products, availability of products exceeding any cut-offs went from 97% to 14% , whereas liquid products went from 75.8% to 14.3%. Solid products had a substantial reduction in calories (-178 kcal/100 g), total sugar (-21 g/100 g), saturated fat (-5.6 g/ 100 g), and sodium (-173 mg/ 100 g). Liquid products had a reduction in calories (-23 kcal/ 100 ml), total sugar (-6 g/100 ml), and saturated fat (-0.1 g/ 100 ml), whereas sodium (+5 mg/100 ml) increased. | Gender blind intervention and analysis | X |
| O II + | *Ares, G., Antúnez, L., Curutchet, M. R., Galicia, L., Moratorio, X., Giménez, A., & Bove, I. (2021). Immediate effects of the implementation of nutritional warnings in Uruguay: Awareness, self-reported use and increased understanding. Public Health Nutrition, 24(2), 364–37. https://doi.org/10.1017/S1368980020002517* | Uruguay | 2020 | Law prescribing food industry to use nutritional warning labels | General public | Before-after comparison | Only post-regulation: Consumer awareness of nutritional warnings; Self-reported use of nutritional warnings when making food purchases; Before and after regulation: Understanding of nutritional information by correctly identifying the healthiest product and by correctly identifying excessive nutrient content | The percentage of participants who correctly identified the healthiest product significantly increased with the inclusion of nutritional warnings on food packages. On average, before the regulation, participants provided 1.7/ 3 correct responses; after the regulation, the average number was significantly higher with 2.5/3 responses correct. The percentage of participants who provided correct responses was significantly higher post-regulation than pre-regulation. The effect of warnings markedly differed across nutrients. More than 50% of people who had seen nutrition warnings on foods stated that they modified their purchase decision after noticing the warnings on the product. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O III + | ***Croker, H., Packer, J., Russell, S. J., Stansfield, C., & Viner, R. M. (2020). Front of pack nutritional labelling schemes: a systematic review and meta-analysis of recent evidence relating to objectively measured consumption and purchasing. Journal of Human Nutrition and Dietetics, 33(4), 518–537. https://doi.org/10.1111/jhn.12758*** | Multiple | 2020 | Front of pack labelling | General public | Meta-analysis: consumption (experimental; n = 3) and purchasing (n = 8, experimental; n = 3, interrupted time series). | Sugar, calorie, saturated fat and sodium content of food purchases and consumption | Sugar and sodium content of purchases was lower for combined front of package label (FOPL) versus no-FOPL (-0.40 g sugar /100 g, P < 0.01; -24.482 mg sodium /100 g, P = 0.012), with a trend for lower energy and saturated fat (-2.03 kcal /100 g, P = 0.08; -0.154 g saturated fat /100 g, P = 0.091). Products purchased by 'high in' FOPL groups had lower sugar (-0.67 g sugar /100 g, P ≤ 0.01), calories (-4.43 kcal /100 g, P < 0.05), sodium (-33.78 mg /100 g, P = 0.01) versus no-FOPL. Multiple Traffic Light had lower sodium (-34.94 mg /100 g, P < 0.01) versus no-FOPL. Findings regarding consumption were limited and inconsistent. | Gender blind intervention and analysis | X |
| | **Food environment – Institutions** | | | | | | | | | X |
| | **I. Packaging innovations** | | | | | | | | | X |
| E V + | ***Lenjiso, B. M., Smits, J., & Ruben, R. (2016). Transforming Gender Relations through the Market: Smallholder Milk Market Participation and Women`s Intra-household Bargaining Power in Ethiopia. The Journal of Development Studies, 52(7), 1002–1018. https://doi.org/10.1080/00220388.2016.1139693***. Ruben, R., Dekeba Bekele, A., & Megersa Lenjiso, B. (2017). Quality upgrading in Ethiopian dairy value chains: dovetailing upstream and downstream perspectives. *Review of Social Economy*, 75(3), 296–317. https://doi.org/10.1080/00346764.2017.1286032 | Ethiopia | 2016 | (Upstream) commercial dairy farming (downstream) healthy and nutritious dairy products | Dairy farm households in Oromia, Ethiopia; (consumer) households from Addis Ababa (and peri-urban areas) | Dairy farm households: field experiment (coordination game) and household survey; (consumer) households: field experiments: elicit consumer values for improved pasteurized milk, elicit consumer values for fat-modified milk products | (Upstream) dairy farm households: 1) intra-household time allocation, (2) women`s intra-household bargaining power, (3) intra-household milk consumption, dietary diversity and nutritional status of young children, and (4) parental investment in child education. (Downstream) consumer households: consumer values for improved pasteurized milk, and or fat-modified milk products | (Upstream) Commercial orientation of dairy households is positively related with women's bargaining position, dietary diversity and nutritional status of U5 children and the willingness to invest in child education. (Downstream) Sensory characteristics (taste) plays a key role in the willingness to pay for reduced fat milk (versus whole milk). Providing nutrition information has no significant effect on a price premium for reduced fat milk. 23% of 160 experiment participants from Addis Ababa were willing to upgrade from whole milk to reduced fat milk but only 10% after tasting both products; and 28% after providing nutrition information about whole milk and reduced fat milk. | Gender blind intervention; Gender aware analysis | X |
| E III + | ***Bekele, A. D., Beuving, J., & Ruben, R. (2016). Food choices in Ethiopia: does nutritional information matter? International Journal of Consumer Studies, 40(6), 625–634. https://doi.org/10.1111/ijcs.12278*** | Ethiopia | 2016 | Nutritional information | Consumers from Addis Ababa (and peri-urban areas) | Field experiments (willingness to pay): elicit consumer values for improved pasteurized milk, elicit consumer values for fat-modified milk Products | Consumer valuation of improved pasteurized milk, and or fat-modified milk products | Despite the lower demand for reduced-fat milk compared with whole milk, urban consumers in Ethiopia are willing to pay a 2.8% price premium for reduced-fat milk, lower than the actual market price. This is probably related to the consumers' relatively limited purchasing power and lower perceived value attached to reduced-fat milk than whole milk. Consumers prefer the taste of whole milk, and believe that more fatty milk is more nutritious. Men are willing to pay a higher premium for reduced-fat milk than women. Women use milk for food preparation and higher fat contents are preferable. Higher educated consumers are more likely to trade nutrition for taste, yet women are generally lowly educated in this context. Younger consumers are more likely to pay a premium for reduced-fat milk. | Gender blind intervention; Gender disaggregated analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O I + | *Khandpur, N., de Morais Sato, P., Mais, L. A., Bortoletto Martins, A. P., Spinillo, C. G., Garcia, M. T., Urquizar Rojas, C. F., & Jaime, P. C. (2018). Are front-of-package warning labels more effective at communicating nutrition information than traffic-light labels? A randomized controlled experiment in a Brazilian sample. Nutrients, 10(6), 1–15. https://doi.org/10.3390/nu10060688* | Brazil | 2018 | Warning labels (labels indicating excess sugars, saturated fat, total fat, or sodium, with the phrase 'High in') vs traffic-light labels (green, amber, or red colours depicting low, medium, or high content for total sugars, saturated fat, and sodium, in keeping with nutritional guidelines) | General public | Online RANDOMISED CONTROL TRIAL | Understanding of nutrient content; Understanding of label; Perceived product healthfulness; Purchase intentions | Versus no labels, warning labels on products were more helpful than traffic light labels for participants to (i) improve their understanding of excess nutrient content (27.0% versus 8.2%, p < 0.001); (ii) improve their ability to identify the healthier product (24.6% versus 3.3%, p < 0.001); (iii) make perceptions of healthfulness more accurate and (iv) correctly identify healthier products (14.0% versus 6.9%, p < 0.001), relative to the control condition. A higher percentage increase of participants expressed the intention to purchase the healthier option (16.1% versus 9.8%, p < 0.001) and the intention not to buy any product (13.0% versus 2.9%, p < 0.001) when there was a warning label, as compared to traffic light label (versus no label). For certain products, traffic light labels worsened consumer judgment of healthfulness. | Gender blind intervention and analysis | X |
| O III + | *Shangguan, S., Afshin, A., Shulkin, M., Ma, W., Marsden, D., Smith, J., Saheb-Kashaf, M., Shi, P., Micha, R., Imamura, F., & Mozaffarian, D. (2019). A Meta-Analysis of Food Labeling Effects on Consumer Diet Behaviors and Industry Practices. American Journal of Preventive Medicine, 56(2), 300–314. https://doi.org/10.1016/j.amepre.2018.09.024* | Multiple (mostly Western, 2 Asian countries) | 2019 | Food and beverage labelling | General public | Systematic review including randomised control trials, interventions with external controls; interventions with pre/post Comparisons | Consumer energy intake; unhealthy dietary options; vegetable consumption; industry responses in terms of product contents | Food labelling decreased consumer intakes of energy by 6.6% (95% CI= −8.8%, −4.4%, n=31), total fat by 10.6% (95% CI= −17.7%, −3.5%, n=13), and other unhealthy dietary options by 13.0% (95% CI= −25.7%, −0.2%, n=16), while increasing vegetable consumption by 13.5% (95% CI=2.4%, 24.6%, n=5). Regarding industry responses, labelling decreased product contents of sodium by 8.9% (95% CI= −17.3%, −0.6%, n=4) and artificial trans-fat by 64.3% (95% CI= −91.1%, −37.5%, n=3). | Gender blind intervention and analysis | X |
| O II + | *Grummon, A. H., & Hall, M. G. (2020). Sugary drink warnings: A meta-analysis of experimental studies. PLoS Medicine, 17(5), 1–21. https://doi.org/10.1371/journal.pmed.1003120* | Multiple (1/3 Latin America; other USA or Canada) | 2020 | Sugary drink warnings | General public | Systematic review including experimental designs using Between-person manipulations or within person manipulations | Perceptions of health effects, healthfulness, disease likelihood of sugary drinks. Hypothetical and actual consumption and purchasing of sugary drinks | Relative to control conditions, sugary drink warnings caused stronger negative emotional reactions (d = 0.69; 95% CI: 0.25, 1.13; p = 0.002) and elicited more thinking about the health effects of sugary drinks (d = 0.65; 95% CI: 0.29, 1.01; p< 0.001). Sugary drink warnings led to lower healthfulness perceptions (d = -0.22; 95% CI: 0.27, 0.17; p<0.001) and stronger disease likelihood perceptions (d = 0.15; 95% CI: 0.06, 0.24; p = 0.001). Sugary drink warnings reduced hypothetical (d = - 0.32; 95% CI: -0.44, -0.21; p < 0.001) and actual consumption and purchasing behaviour (d = -0.17; 95% CI: 0.30, 0.04; p = 0.012). Health warnings led to greater reductions in hypothetical sugary drink purchases than nutrient warnings (e.g., "High in sugar"; d = -0.35 versus - 0.18; Q = 4.04; p = 0.04). | Gender blind intervention and analysis | X |
| O I + | *Zou, P., & Liu, J. (2019). How nutrition information influences online food sales. Journal of the Academy of Marketing Science, 47(6), 1132–1150. https://doi.org/10.1007/s11747-019-00668-4* | China | 2019 | Nutrition information, seller's reputation, online rating/cue in online marketplace | General public | Regression (association nutrition information and sales, interaction with nutrition information and seller's reputation, perceived healthiness); lab experiment healthy/unhealthy food x with/without nutrition info | Regression: online buying (sales) of healthy food Experiment: eye fixation on nutrition information, price and seller reputation | Data from 1474 online food sellers collected from Taobao.com (the largest online shopping platform in China) revealed a positive association between available nutrition information and online food sales. This association is stronger when the seller also has a good online reputation (through online customer feedback); and for foods that are perceived as healthy compared to foods that are perceived as unhealthy. Consumers tend to ignore nutrition information when it is presented in connection with unhealthy food products. A lab experiment presented students with 2x2 combinations of online buying of healthy/unhealthy food and with/without nutrition information. It confirms that attention for nutrition information is higher for healthy foods and more strongly associated with sales for those foods. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| | **II. Retail outlet innovations** | | | | | | | | | X |
| V IV 0 | ***Rupa, J. A., Umberger, W. J., & Zeng, D. (2019). Does food market modernisation lead to improved dietary diversity and diet quality for urban Vietnamese households? Australian Journal of Agricultural and Resource Economics, 63(3), 499–520. https://doi.org/10.1111/1467-8489.12308*** | Vietnam | 2019 | Supermarkets | Urban residents in Vietnam | Instrumental Variable (IV) Regression | Household dietary diversity, diet quality (nutrient adequacy, protein, vitamin A and heme iron) | The effect of the household's share of monthly food expenditures at modern markets (including supermarkets, mini-markets, and/or convenience stores) in the household's total monthly food expenditures (IV) on households' diet diversity is not significantly different from zero. The association of modern market food expenditure share with diet quality via household diet diversity (three stage IV model ) is found to be positive for heme iron and protein, negative for vitamin A. | Gender blind intervention and analysis | X |
| V III 0 | ***Figuié, M., & Moustier, P. (2009). Market appeal in an emerging economy: Supermarkets and poor consumers in Vietnam. Food Policy, 34(2), 210–217. https://doi.org/10.1016/j.foodpol.2008.10.012*** | Vietnam | 2009 | Supermarkets | Poor urban residents in Hanoi, Vietnam | Qualitative | Purchasing practices | Poor urban households spent 0.3% of food expenditures in supermarkets and bought different food items from different outlets. Barriers for poor consumers to purchase food from supermarkets include relatively high prices, distance, problems of storage at home, and the feeling of not being targeted as a customer by the supermarkets. Poor consumers felt their usual outlets provided sufficient variety and were more convenient, even if they thought supermarkets offer more diversity, higher quality and better food safety and projected higher standing and modernity. | Gender blind intervention and analysis | X |
| V III / | ***Wertheim-Heck, S. C. O., & Raneri, J. E. (2020). Food policy and the unruliness of consumption: An intergenerational social practice approach to uncover transforming food consumption in modernizing Hanoi, Vietnam. Global Food Security, 26(August). https://doi.org/10.1016/j.gfs.2020.100418*** | Vietnam | 2020 | Food retail change towards supermarketisation (not an intervention) | Poor urban residents in Hanoi, Vietnam | Qualitative (multi-generational and dyadic interviews with women - dyad= main respondent and her mother (in-law)) | Shopping and food consumption practices | Food safety has replaced food security as today's major concern. Supermarkets were not frequently utilized because (1) they were not fully trusted to offer better food safety than traditional markets, (2) consumers prefer to purchase fresh foods every day, and (3) traditional markets fit into younger women's modernized lifestyles. Informal networks are used to acquire fresh food through networks, both in person and online. Children's tastes and preferences were hence observed to be causing the shift in diets from being traditional healthy, and more sustainably fresh and plant based to being increasingly meat-centred, more processed food (e.g. Pizza), deep fried food, ready-to-eat snacks, and sugar sweetened drinks. | Instrumental focus on women or women's empowerment ; Gender blind analysis | X |
| V IV + | ***Trinh, H. T., Dhar, B. D., Simioni, M., de Haan, S., Huynh, T. T. T., Huynh, T. V., & Jones, A. D. (2020). Supermarkets and Household Food Acquisition Patterns in Vietnam in Relation to Population Demographics and Socioeconomic Strata: Insights From Public Data. Frontiers in Sustainable Food Systems, 4(February), 1–12. https://doi.org/10.3389/fsufs.2020.00015*** | Vietnam | 2020 | Supermarkets | General population Vietnam | Regressions Provinces classified into three clusters based on the number of supermarkets: high, medium, and low density | Continuous acquired food diversity score Food basket quality (the proportion (in percentage) of calories coming from protein, fat and carbohydrate) | A higher number of supermarkets is associated with exceeding Vietnamese recommendation composition of macronutrients, but not food quantity at the household-level. Households with higher per capita food expenditure in provinces with high supermarket density tended to procure foods with higher protein content and lower shares of fat and carbohydrate. Ethnic minority households in clusters with medium supermarket density obtained food with lower carbohydrate and higher fat to protein ratios in comparison to ethnic majority households. Larger-sized households in provinces with high supermarket density typically bought foods with higher fat shares than smaller-sized households. In provinces with medium and low supermarket density, larger-sized households typically procured foods with higher protein and lower fat shares. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O V - | *Demmler, K. M., Ecker, O., & Qaim, M. (2018). Supermarket Shopping and Nutritional Outcomes: A Panel Data Analysis for Urban Kenya. World Development, 102, 292–303. https://doi.org/10.1016/j.worlddev.2017.07.018* | Kenya | 2018 | Supermarkets | Residents of small towns (<70 thousand inhabitants) | Difference-in-difference (fixed effects) for 1/3 of sample with panel data; random effects for entire sample of which 2/3 was replaced at second round of survey | Body mass index (BMI) of adults; classification of Individuals according to their nutritional status using common international thresholds for BMI; 30-day recall food consumption data; total energy consumption per person; energy consumption from specific food groups | People shop in supermarkets in addition to traditional sources. Shopping in supermarkets increases individual body mass index by 0.64 kg/m2. There is some support for a positive effect of shopping in supermarkets on the likelihood of obesity/overweight. Shopping in supermarkets does not affect total energy consumption of households and individuals but increases the share of energy from highly processed foods. Supermarket shopping reduces energy consumption from unprocessed staples by 112 kcal/ae/day, and from fresh fruits and vegetables by 124 kcal/ae/day. Supermarket shopping increases consumption of meat and fish by 24 kcal/ae/day, of dairy and eggs by 9 kcal/ae/day, and of vegetable oils by 60 kcal/ae/day. | Gender blind intervention; Gender aware analysis | X |
| O V + | *Debela, B. L., Demmler, K. M., Klasen, S., & Qaim, M. (2020). Supermarket food purchases and child nutrition in Kenya. Global Food Security, 25(August 2019). https://doi.org/10.1016/j.gfs.2019.100341* | Kenya | 2020 | Supermarkets | Children in households residents of small towns (<70 thousand inhabitants) | Instrumental variable (distance to the nearest supermarket as instrument for supermarket purchases and share of supermarket purchases) +difference-in-difference (fixed effects) for 1/3 of sample with panel data; random effects for entire sample of which 2/3 was replaced at second round of survey | Child height-for-age, weight-for-age, and weight-for-height z-scores. | Supermarket purchases cause a height gain of 1.92 cm for an eight-year-old boy and of 1.97 cm for an-eight-year-old girl. A 1% increase in the share of Supermarket purchases leads to a 0.02 higher height-for-age z-score. Supermarket purchases cause an increase in weight-for-age z-score of 0.09. The effect on children's weight is equivalent to 0.33 kg and 0.36 kg weight gain for an eight-year-old boy and girl, respectively. The effect on weight is smaller than the effect on height. Households with supermarket purchases have significantly higher food variety scores and dietary diversity scores than households without supermarket purchases. When excluding unhealthy foods, the positive effects on higher food variety scores and dietary diversity scores remain. Supermarket purchases increase the likelihood of purchases of animal source foods and fruits, contributing to diet diversity and improved child nutrition. | Gender blind intervention; Gender disaggregated analysis | X |
| O V - | *Umberger, W. J., He, X., Minot, N., & Toiba, H. (2015). Examining the relationship between the use of supermarkets and over-nutrition in Indonesia. American Journal of Agricultural Economics, 97(2), 510–525. https://doi.org/10.1093/ajae/aau111* | Indonesia | 2015 | Supermarkets | Adults and children 2 to 18 years in urban households located in Three cities on java island in Indonesia | Regression control and iv (instrument for share of food expenditures in supermarket is indicator that respondent believes that a retail outlet offering High-quality food products is an important criterion when deciding to buy food) | Body mass index (BMI) z-scores of individuals; overweight according to who (BMI > 25), specific for Indonesia (BMI > 22), relative (>85$^{th}$ percentile for age/gender) ; obese according to who (BMI > 30), specific for Indonesia (BMI > 27), relative (>95$^{th}$ percentile for age/gender) | Household's share of total annual food expenditures made in supermarkets does not have a significant effect on adults' Body mass index (BMI) nor on the likelihood of adults being overweight or obese. Regression control model suggest a positive correlation between household's share of total annual food expenditures made in supermarkets and children's BMI. Overall, there is no effect of household's share of total annual food expenditures in supermarkets on the likelihood of children being overweight or obese. However, in the group of high-income households, food shopping in supermarkets has a positive effect on the likelihood of children being overweight and obese. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O III+/- | *Khonje, M. G., & Qaim, M. (2019). Modernization of African food retailing and (un)healthy food consumption. Sustainability, 11(16), 1–18. https://doi.org/10.3390/su11164306* | Zambia | 2019 | Modern retail (Supermarkets, convenience store, etc.) | Urban households in Zambia | Descriptive analysis Regressions | Use of different types of retailers; household and food expenditures on unprocessed foods, primary processed foods, and ultra-processed foods | Many consumers use both modern and traditional retailers. There is a positive relation between household income and the likelihood of using modern supermarkets and that of using traditional kiosk. Higher education is associated with higher likelihood of using supermarkets at the expense of traditional grocery markets, roadside markets and kiosks. The higher the share of food expenditures made in supermarkets, the higher the consumption of ultra-processed and primary processed foods, and the lower the consumption of unprocessed foods. Unexpectedly, the same is true for food expenditures made in traditional grocery stores and neighbourhood kiosks. Use of supermarkets is associated with higher consumption of meat and fish, dairy products and sweetened beverages. Use of traditional and roadside markets is associated with higher consumption of vegetables. The use of grocery store, roadside market and kiosk is associated with higher consumption of dairy products and eggs. | Gender blind intervention and analysis | X |
| | **III. Healthy street foods** | | | | | | | | | X |
| O II 0 | *Sun, Y., Liguori, K., Moussavi, P., & Mehta, K. (2015). Piloting a Healthy Street Food Venture in Kenya: Lessons Learned. Procedia Engineering, 107, 417–426. https://doi.org/10.1016/j.proeng.2015.06.100* | Kenya | 2015 | Healthy street food | Urban residents in Nyeri town, Kenya | Qualitative | Consumer preferences for healthier street food | Young and wealthier people showed more interest in a vegetable pizza as a healthier street food option, nutrition was not a defining factor for interest in the product but price was. The vegetable pizza, even if people like its taste and 'modern' and 'cool' status, was considered relatively expensive, especially by lower-income consumers. The authors deem selling vegetable pizza unlikely to be a viable business model. | Gender blind intervention and analysis | X |
| N III + | *Snoek, H. M., Raaijmakers, I., Lawal, O. M., & Reinders, M. J. (2020) Convenience vegetable intervention in urban Nigeria: Veg-on-Wheels – A proof-of-principle study. Unpublished* | Nigeria | 2020 | Veg-on-Wheels: mobile sales points of washed and pre-cut, cooled green leafy vegetables | Out of urban population Akure near workplaces and open market: people responsible in their household for buying green leafy vegetables (mostly women) | Quantitative: before (control period without veg on wheels) - after (treatment period during veg on wheels) (differences between buyers and non-buyers in treatment period) | During treatment period: Awareness of the Veg-on-Wheels intervention; Vegetable consumption; attitude towards the Veg-on-Wheels intervention; Barriers to buying green leafy vegetables from Veg-on-Wheels; Motives for buying green leafy vegetables from Veg-on-Wheels; Consumers' satisfaction | Before the intervention, the average weekly intake was 8.3 serving spoons. When veg-on-wheels was offering products, buyers reported consuming 10.8 serving spoons per week, non-buyers 8. Buyers reported eating a wider variety of vegetables than non-buyers. In buyers' perceptions, they ate green leafy vegetables more often, larger portions, higher quality green leafy vegetables and the healthiness of food intake increased due to veg on wheels. Buyers' attitudes towards veg on wheels was more positive than that of non-buyers, buyers were generally satisfied with veg on wheels. Buyers' motives to buy from Veg-on-Wheels related to quality, hygiene, appearance, health, curiosity to try, trust and convenience. Reasons for not buying are mostly related to trust in the vendors. | Gender blind intervention; Analysis of impact on women only | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| | **IV. Institutional purchasing** | | | | | | | | | X |
| B V + | ***Hossain, M., slam, Z., Sultana, S., Rahman, A. S., Hotz, C., Haque, M. A., Dhillon, C. N., Khondker, R., Neufeld, L. M., & Ahmed, T. (2019). Effectiveness of workplace nutrition programs on anemia status among female readymade garment workers in Bangladesh: A program evaluation. Nutrients, 11(6), 1–23. https://doi.org/10.3390/nu11061259*** | Bangladesh | 2019 | Workplace Nutrition Programs: In one out of two readymade garment (RMG) factories that already provided lunch with regular behaviour change counselling (BCC) to female workers, the intervention package consisted of daily nutritionally-enhanced (with fortified rice) hot lunch, once weekly iron-folic acid (IFA) supplement and monthly enhanced (with nutrition module) BCC over a 10-month period. In one out of two factories that only provided BCC but no lunch, the intervention package consisted of twice-weekly IFA and enhanced BCC. | | Difference-in-Difference Qualitative | Difference-in-Difference: Body weight and capillary haemoglobin (to measure anaemia); Qualitative: knowledge of different vitamin and mineral containing foods and their benefits | Both the intervention package of lunch, IFA and enhanced BCC (in lunch providing factories) and the interventions package of IFA and enhanced BCC (in no lunch factories) significantly reduced anaemia, respectively by 23 and 12 percentage points, and increased mean haemoglobin concentration. Knowledge of different vitamin and mineral containing foods and their benefits generally increased regardless of the type of intervention. | Women targeted; Analysis of impact on women only | X |
| B V + | ***Murayama, N., Magami, M., Akter, S., Hossain, I. A., Ali, L., Faruquee, M. H., & Ahmad, S. A. (2018). A Pilot School Meal Program Using Local Foods with Soybean in Rural Bangladesh: Effects on the Nutritional Status of Children. Food and Nutrition Sciences, 09(04), 290–313. https://doi.org/10.4236/fns.2018.94023*** | Bangladesh | 2018 | School Meal with local foods including soybean and containing more than one-third of the recommended daily allowance of energy and nutrients | Children 5-13 years in primary schools in south west Bangladesh | Difference-in-Difference (Ancova) | Anthropometric: height, height-for-age z-score Biochemistry: haemoglobin and micronutrient status | After the intervention, children in the treatment school showed a significantly larger improvement in height (3.8 (0.1) cm vs 3.3 (0.1) cm ($P < 0.001$)), height-for-age Z-score (0.03 (0.01) vs −0.04 (0.01) ($P < 0.001$), haemoglobin and red blood cell count (0.0 (0.1) g/L vs −0.5 (0.1) g/L ($P < 0.001$) and 0.2 (0.0) vs 0.1 (0.0) ($P = 0.001$), respectively) than children in the school that served as control. However, changes between baseline and endline in the body mass index (BMI)-for-age Z-score, weight-for-age z-score, anaemia, depleted iron stores, subclinical vitamin A deficiency or zinc deficiency did not differ significantly between children from the treatment and control school. | Gender blind intervention and analysis | X |
| N III + | ***Agbon, C. A., Onabanjo, O. O., & Okeke, E. C. (2012). Daily nutrient contribution of meals served in the home grown school feeding of Osun State, Nigeria. Nutrition and Food Science, 42(5), 355–361. https://doi.org/10.1108/00346651211266872*** | Nigeria | 2012 | Standardised nutritious school meals | Children in primary schools in Osun state Nigeria | Analysis of nutrient content of standardised school meals | Daily nutrient contribution of meals in weekly menu plan served in primary schools | A weekly menu plan in primary schools in Osun state in Nigeria provided adequate protein intake (i.e. 30-45% of children's daily requirement). Energy intake was adequate except for the first meal of the week (beans and maize with fish stew). Zinc intake did not reach 30% of their daily requirement. The inclusion of cocoa powder in one meal added nutrients to the children's meal. Including various leafy vegetables including amaranthus may be a cheap way to increase the zinc contents. The meals were insufficiently varied, which makes them less appealing. Most contain beans, which some children do not eat. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| N III +/- | *Ayogu, R. N. B., Eme, P. E., Anyaegbu, V. C., Ene-Obong, H. N., & Amazigo, U. V. (2018). Nutritional value of school meals and their contributions to energy and nutrient intakes of rural school children in Enugu and Anambra States, Nigeria. BMC Nutrition, 4(1), 1–11. https://doi.org/10.1186/s40795-018-0216-0* | Nigeria | 2018 | School meals | Children in primary schools in rural areas in Enugu And Anambra States, Nigeria | Analysis nutrient content of school meals | Nutritional value of school meals and their contributions to energy and nutrient intakes | The foods consumed by children in a selection of primary schools in rural areas in Enugu and Anambra States, Nigeria, provided more than one third of the daily recommended nutrient intake (RNI) for protein, zinc, vitamins A and C but failed to meet a third of the RNI for calcium, iron and energy. The portion sizes were not nutrient dense enough to provide the required one third of the energy requirement. To meet RNI of calcium, milk and yoghurt should be added in larger quantity to school meals, use of leafy vegetables is insufficient. | Gender blind intervention and analysis | X |
| N / | *Ademokun, O. M., Osungbade, K. O., & Obembe, T. A. (2014). A Qualitative Study on Status of Implementation of School Health Programme in South Western Nigeria: Implications for Healthy Living of School Age Children in Developing Countries. American Journal of Educational Research, 2(11), 1076–1087. https://doi.org/10.12691/education-2-11-12* | Nigeria | 2014 | School health program (Healthful School environment, school health services, skill based health education, and school feeding services) which is part of the National School Health Policy 2006 | Public secondary schools in Ibadan Nigeria | Qualitative | Status of implementation of the four components of the School Health Programme: healthful school environment, school health services, skill based health education, and school feeding services | Rather than offering school meals, schools rely on food vendors who have undergone series of tests and trainings and are certified fit to sell food to the students. The policy that there should be regular de-worming of students seem not implemented. Food safety measures such as the use of aprons and hairnets and clean food serving areas were mostly applied. | Gender blind intervention and analysis | X |
| V V + | *Hall, A., Hanh, T. T. M., Farley, K., Quynh, T. P. N., & Valdivia, F. (2007). An evaluation of the impact of a school nutrition programme in Vietnam. Public Health Nutrition, 10(8), 819–826. https://doi.org/10.1017/S1368980007382530* | Vietnam | 2007 | School nutrition program with daily provision of milk and biscuits fortified with minerals and vitamins supplying 300 kcal of energy and deworming twice over 17 months | Primary schools in Dong Thap Province, Vietnam | Difference-in-Difference | Height-for-age and weight-for-age z-scores | Compared to children in control schools, children in treatment schools gained significantly more weight (3.19 vs. 2.95 kg) and height (8.15 vs. 7.88 cm). Yet, the difference between the means was small: 0.27 cm in height and 0.24 kg in weight. Analysis of the gain in body weight confirms the positive effect of fortified milk and biscuits. The effect on weight is larger for older children and for children who had a higher initial weight-for-age z-score. There is no difference in weight gain between boys and girls. | Gender blind intervention; Gender disaggregated analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| V III + | *Nguyen, T., de Brauw, A., van den Berg, M., & Phuong Ha, D. T. (2020). Testing methods to increase consumption of healthy foods: Evidence from a school-based field experiment in Viet Nam. IFPRI Discussion Paper 1939. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133777* | Vietnam | 2020 | Nutrition education: presented to children by teachers focused on balanced diets, recommended daily consumption of fruits and vegetables (FAV), benefits of FAV, and how to incorporate more FAV into their meals. The format consisted of five-minute show-and-tell talks before lunch twice a week, during 5 weeks. Children were encouraged to share what they had learned during the nutrition education sessions with their family members. Access to healthy foods, fruits more in particular: providing free fruit as a morning snack to children, 5 days per week for 5 weeks | Children in primary schools in a relative poor district in peri-urban Hanoi | Cluster-randomized trial at the level of schools; for the nutrition education treatment: per school some grades were assigned to treatment and other grades to control; one out of 6 pairs of schools was selected for the fruit snack treatment | Nutrition knowledge index score at short term and after 6 months; children's daily fruit consumption; nutrition knowledge among parents | At the end of the 5 weeks, on average, the children who were offered the nutrition lessons gained 0.33 standard deviations in the nutrition knowledge index score. There were no significant changes in knowledge and attitude among parents. There was no additional effect on knowledge when the nutrition lessons were combined with the fruit intervention. Neither the nutrition lessons nor fruit provision led to a significant change in children's attitudes about FAV consumption. Education lessons Did not influence the FAV consumption by children. Access to free fruit increased children's fruit consumption but by half the portion than was provided, doubling the daily fruit consumption vis-a-vis the control group. After 6 months, the nutrition lessons Did not have an effect anymore on children's nutrition knowledge and attitude. | Gender blind intervention and analysis | X |
| | **V. Private sector and local initiatives in fortified foods marketing** | | | | | | | | | X |
| B IV 0 | *Agnew, J., & Henson, S. (2018). Business-Based Strategies for Improved Nutrition: The Case of Grameen Danone Foods. IDS Bulletin, 49(1). https://doi.org/10.19088/1968-2018.103* | Bangladesh | 2018 | Micronutrient fortified yoghurt produced and marketed through Grameen Danone Foods Ltd (GDFL). | Poor rural households, school children in urban schools (in relatively poor areas) | Qualitative: challenges to sustained sales at scale; correlation household purchases of fortified yoghurt and diet diversity of children | Business viability: awareness raising about nutritional benefits; consistent supply (availability); Children's nutrition: diet diversity score | Nearly all respondents who were aware of the Shokti brand believed that the product was good for their child (98%). Of these respondents, 82% were able to cite correctly at least one potential benefit. According to 27% of rural respondents and 52% of urban school respondents, the lack of availability prevented regular consumption. In rural communities, affordability of the product and financial constraints are key barriers. Distribution channels e.g. Chokti ladies get incentive per pot sold, which probably incentivizes them to sell to customers with greater purchasing capacity. The social goal of offering rural milk producers and Chokti ladies employment prevents cutting costs. Children in households that had consumed the yoghurt in the last week had higher mean diet diversity score than in households that did not and households without awareness of the yoghurt. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B V + | *Ahmed, S., Sarma, H., Hasan, Z., Rahman, M., Ahmed, M. W., Islam, M. A., Djimeu, E. W., Mbuya, M. N., Ahmed, T., & Khan, J. A. (2020). Cost-effectiveness of a market-based home fortification of food with micronutrient powder programme in Bangladesh. Public Health Nutrition, 1–12. doi:10.1017/S1368980020003602*<br>*Danse, M., Klerkx, L., Reintjes, J., Rabbinge, R., & Leeuwis, C. (2020). Unravelling inclusive business models for achieving food and nutrition security in BOP markets. Global Food Security, 24(October 2019), 100354. https://doi.org/10.1016/j.gfs.2020.100354* | Bangladesh | 2020 | Locally produced micro-nutrient powder for home fortification for complementary feeding for infants and young children (6 to 59 months) in Bangladesh, produced and marketed in a partnership between the private sector and a local NGO in a social enterprise model. | Infants and young children (6-59 months) in poor rural areas in Bangladesh | The total number of anaemia cases = change in anaemia prevalence at endline between the complier group (ever taken MNP) and non-complier groups (never taken MNP) of targeted 6–59 months aged children<br>Total number of disability-adjusted life years (DALY) averted (age weighted) by comparing home fortification programme outcomes with no intervention scenario<br>Cost per anaemia case averted and cost per DALY averted= dividing programme cost with number of anaemia case averted / DALY averted separately in implementation area compared to no intervention situation | Total number of anaemia cases averted<br>Total number of DALY averted<br>Cost per anaemia case averted and cost per DALY averted | The home fortification programme was implemented by BRAC in 164 upazilas (sub-districts) out of 492 in Bangladesh during 2014–2018. The average impact on the reduction of anaemia among the under-five children was estimated to be 12.3 % (prevalence 39.6% vs 27.3%). This corresponds to the aversion of 657,778 under-five anaemia cases. An estimated 140 deaths were averted, which corresponds to 91,588 DALY averted (taking into account severity). Cost per anaemia case averted was estimated to be 22.2 USD. The cost per DALY averted was estimated to be 159.3 USD (about tenth of GDP per capita, therefore very cost-effective according to WHO-provided GDP threshold). | Gender blind intervention and analysis | X |
| E II / | *Danse, M., Klerkx, L., Reintjes, J., Rabbinge, R., & Leeuwis, C. (2020). Unravelling inclusive business models for achieving food and nutrition security in BOP markets. Global Food Security, 24(October 2019), 100354. https://doi.org/10.1016/j.gfs.2020.100354* | Ethiopia | 2020 | Locally sourced and locally produced highly nutritious ready-to-use foods (RUFs) in a social business model (not-for-profit, but run as a business and financially self-sufficient) | Children between 6 and 36 months of age that suffer from severe acute malnutrition; and Base of the Pyramid food consumers in humanitarian emergency camps in East Africa (through WFP) | No identified evaluation | Not specified, but related to improvement of acute malnutrition | The ready-to-use foods (RUFs) are highly fortified, lipid-based nutrient dense pastes designed for preventing and treating malnutrition. To stimulate the local economy as well as providing life-saving products at affordable prices, Valid Nutrition (VN) produces RUFs in the regions in which they are consumed, under license from Nutriset, the company that developed the original formula. It established production and sales facilities in Malawi, Ethiopia and, previously, Kenya. To reach the target group (children between 6 and 36 months of age with severe acute malnutrition), VN sells its products on humanitarian markets: to NGOs, governments and international institutions (UNICEF 65%). | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| N III + | *Bee, J., Diby, P., Mbacke, B., & Wettstein, B. (2015). Nestle: Sustainable Value Chain Management from the Farm to the Fork. In: D'heur (ed.), Sustainable Value Chain Management, CSR, Sustainability, Ethics & Governance, p 313-325. Switzerland: Springer International Publishing. DOI 10.1007/978-3-319-12142-0_14* | Nigeria | 2015 | Private sector initiated fortification of infant food and advertisement campaigns highlighting the importance of appropriate infant feeding practices and the importance of iron and Vitamin A in cereals | Children | Descriptive | Sales of fortified cereal based infant food. | Low cost fortified cereal based infant food produced by nestle are widely consumed in Nigeria, and central and west Africa. Advertisement campaigns highlighting the importance of appropriate infant feeding practices and the importance of iron and vitamin a in cereals boosts sales of Nestle's fortified cereal based infant food. | Gender blind intervention and analysis | X |
| N III / | *Nwuneli, N.; Robinson, E.; Humphrey, J. and Henson, S. (2014). The Role of Businesses in Providing Nutrient-Rich Foods for the Poor: Two Case Studies in Nigeria, IDS Evidence Report 64, Brighton: Institute of Development Studies. http://opendocs.ids.ac.uk/opendocs/handle/123456789/3648* | Nigeria | 2014 | Local production and sales of packaged nutrient-rich foods | General population | Case studies | Business success of local companies offering fortified foods for poor segments of consumers | Lisabi mills produces and markets packaged traditional foods and fortified products in southern Nigeria, Dala foods in the north. Local sourcing of inputs is expensive relative to imported supplies, and is subject to seasonal price fluctuations and inconsistent quality. Existing distribution channels are poorly suited for low-income consumers. Particularly in the north, distribution through supermarkets and local distributors is costly and hampered by poor infrastructure and Dala food's policy for cash on delivery. A non-profit procurement and distribution of Dala food product was particularly successful. Both offer small package sized and low price products to target poor consumers. Dala foods' products are more expensive than alternatives in the informal sector. Both companies use advertisements, including on radio and television, and promotional events. But they face high costs in building demand and signalling to (poor) consumers about the added value of their products. Counterfeiting and fraudulent label claims are common. | Gender blind intervention and analysis | X |
| V V + | *Rocha, C., Yeudall, F., Moraes, A., Yuan, Y., Tenkate, T., Mendonça, M., Duong, V. D., Do Huy, N., Huyn, P., Bao Hoa, D. T., & Brown, M. (2018a). Scaling Up Small-Scale Food Processing For Complementary Food For Children In Vietnam. https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/58560/IDL%20-%2058560.pdf*<br>*Rocha, C., Huy, N. Do, Phuong, H. N., Hoa, D. T. B., Mendonça, M., Brown, M., Moraes, A., & Yeudall, F. (2018b). Scaling Up Small-Scale Food Processing for Therapeutic and Complementary Food for Children in Vietnam. Final Technical Report / Rapport Technique Final. Ryerson university center for studies in food security. https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/57224/57215.pdf* | Vietnam | 2018 | Local supply chain for fortified foods (infant nutrition): long term public-private partnership between the National Institute of Nutrition of Vietnam and a local business woman; nutrition counselling; sale of farmers' produce to a small-scale food processing factory; distribution of fortified foods through local nutrition counselling centres, family-owned convenience stores, and preschools. | Local female rural producers of the fortified product (supply chain); infants and young children at the demand side in remote mountainous regions of northern Vietnam | Simple before-after comparison of nutrition status | Distributed and marketed locally produced fortified instant rice porridge; Children's under 2 nutrition status: prevalence of stunting, wasting, underweight, anaemia prevalence; women's BMI | Rural families learned about the value of fortified foods for young children through nutrition counselling centres. The project created a higher and more stable source of income for smallholder women farmers, and provided sustainable food security for 20,000 women in rural Vietnam. A project note states that child underweight rate reduced to 13.9% from 17.2%; the wasting rate (low weight-for-height) reduced from 7.6% to 3.4%; and the rate of anaemia among children reduced from 61.3% to 16.1% among children who consumed the fortified complementary foods. Mainly the total number of women with BMI below 18.5 decreased between baseline and follow-up. | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| | **VI. Urban agriculture** | | | | | | | | | X |
| B-N-V IV + | *Zezza, A., & Tasciotti, L. (2010). Urban agriculture, poverty, and food security: Empirical evidence from a sample of developing countries. Food Policy, 35(4), 265–273. https://doi.org/10.1016/j.foodpol.2010.04.007* | Vietnam | 2010 | Urban agriculture | Urban population in several LMIC countries including Bangladesh, Nigeria and Vietnam | Regression | Diet diversity, number of foods consumed, calorie consumption | Engaging in urban agriculture is associated with greater diet diversity in several LMIC countries, including Nigeria and Bangladesh. There is no significant correlation in Vietnam. Engaging in urban agriculture is positively correlated with the average number of foods consumed by households in eastern European, Latin American, and Asian LMIC countries, including in Vietnam and Bangladesh. In African LMIC countries, there is no correlation or a negative correlation, as is the case in Nigeria. For Bangladesh, data on calorie consumption was available and the relation with engagement in urban agriculture is found to be positive. | Gender blind intervention and analysis | X |
| | **Food environment - Technology** | | | | | | | | | X |
| | **I. Storage and cold chain innovations** | | | | | | | | | X |
| E II + | *Roche, M. L., Sako, B., Osendarp, S. J. M., Adish, A. A., & Tolossa, A. L. (2017). Community-based grain banks using local foods for improved infant and young child feeding in Ethiopia. Maternal and Child Nutrition, 13(2), 1–15. https://doi.org/10.1111/mcn.12219* | Ethiopia | | Community-based grain banks where local grains and legumes are mixed for complementary food for infants and young children | Infant and young children 6-23 months; rural and semi-urban | Qualitative: Focus group discussions and interviews of both participating and non-participating eligible communities | Perceptions of children's growth and health; care-givers perceptions of the benefits of the grain bank product for complementary feeding and the grain bank project; challenges to the sustainability of the grain bank project | Caregivers perceived positive effects on children's weight and health. Care-givers (women) appreciated the time saving by a readymade mix for complementary feeding, and the advantageous barter exchange rate (rural areas), and the relatively low price (semi-urban areas. The grain bank product was appreciated for being made from local grains and legumes, perceived to be better quality, fresh and culturally accepted. Challenges included limited awareness of the need for complementary feeding and use of grain bank products for infants and young children only. Sustainability is impaired by the reliance on free labour by women for the production, the subsidized barter system and the human and financial capital needed to commercialize the product. | Mothers targeted; Gender blind analysis | X |
| V IV + | *Heard, B. R., Thi, H. T., Burra, D. D., Heller, M. C., Miller, S. A., Duong, T. T., Simioni, M., & Jones, A. D. (2020). The Influence of Household Refrigerator Ownership on Diets in Vietnam. Economics and Human Biology, 39, 100930. https://doi.org/10.1016/j.ehb.2020.100930* | Vietnam | 2020 | Refrigerator | General population Vietnam | Two-step instrumental variable regression Two panels of the Vietnam Household Living Standards Survey (2004-2008 & 2010-2014). | Dietary diversity score, total per capita calorie intake, per capita calorie intakes for major food items, and the ratio between the shares of calories coming from food items with high nutrient intake and food items with low nutrient intake. | Refrigerator ownership (RO) was associated with a significant decrease by 1051.65 Kcal per day per adult equivalent in the first panel while only by 386.93 Kcal in the second panel. RO is implied to have resulted in the households substituting low nutrient food items with higher-nutrient ones, for example an increase in starchy staple food consumption over both periods. In both panels, RO resulted in increases in dairy consumption, possibly reflecting the household's increased capacity to store dairy products. As RO is likely to occur with wealth increase, it can be considered an enabler of wealth to influence diet. | Gender blind intervention and analysis | X |
| V II + | *Rinkinen, J., Shove, E., & Smits, M. (2019). Cold chains in Hanoi and Bangkok: Changing systems of provision and practice. Journal of Consumer Culture, 19(3), 379–397. https://doi.org/10.1177/1469540517717783* | Vietnam | | Fridge freezers | Urban middle-class residents in Hanoi, Vietnam, and Bangkok, Thailand | Qualitative; comparative | Content of fridge freezers, shopping and consumption patterns | In Bangkok, fridge-freezers fit into shopping patterns relying on supermarkets or ready-made meals and (frozen) 'modern' foods. In Hanoi, they fit into shopping patterns relying on local food sources in nearby rural areas, better trusted for food safety, and supermarkets, considered a convenient outlet of fresh produce such as dairy products or snacks. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| | **II. Fortified food (supplements)** | | | | | | | | | X |
| E V 0/+ | *Aboud, F. E., Bougma, K., Lemma, T., & Marquis, G. S. (2017). Evaluation of the effects of iodized salt on the mental development of preschool-aged children: a cluster randomized trial in northern Ethiopia. Maternal and Child Nutrition, 13(2), 1–13. https://doi.org/10.1111/mcn.12322* | Ethiopia | 2017 | Iodized salt | Children 4 to 6 years of age in Amhara region of northern Ethiopia which had an adult goiter rate of 29% | Cluster randomized effectiveness trial at district level | Cognitive/language test score; Height-for-age z-score, weight-for-age z-score, urinary iodine concentration, haemoglobin concentration (Hb) | At endline, urinary iodine concentration levels were higher in intervention than control children (p<0.0001); 72.23% and 58.36% respectively, though both medians were above threshold. Haemoglobin levels were significantly higher in control children, although both groups were well above the threshold of 110 g/L. The dietary diversity of intervention children was significantly higher than controls, although both were below the level of a minimum adequate diet (4 food categories). There were no differences between groups in height-for-age and weight-for-age z-scores. There were no significant main effect differences between groups on the cognitive/language tests. Intervention children whose mothers had some schooling performed better than controls whose mothers had some schooling. | Gender blind intervention and analysis | X |
| E & V +/- | *Alves, C., Saleh, A., & Alaofè, H. (2019). Iron-containing cookware for the reduction of iron deficiency anemia among children and females of reproductive age in low- And middle-income countries: A systematic review. PLoS ONE, 14(9), 1–22. https://doi.org/10.1371/journal.pone.0221094* | Multiple (including Ethiopia, Vietnam) | 2019 | Iron cooking pots to reduce iron deficiency (ID) and iron deficiency anaemia (IDA) by delivering bioavailable iron to food during preparation | Children four months to 11 years and women of childbearing age (12–51 years). | Systematic review (Randomized-controlled trials, quasi-experimental studies and observational studies with a control group) | Haemoglobin (Hb) and iron status (serum ferritin (SF), serum iron (sfe), total iron binding capacity (TIBC), soluble transferrin receptor concentration (stfr), serum transferrin (ST) and transferrin saturation (TS); Secondary outcomes of interest included iron content and bioavailability of food. | Statistically significant increases in haemoglobin and/or iron indices (p < 0.05) were observed in 50% (4/8) of studies on pots (relative change/mean difference in Hb: -0.4–1.20 g/dl). Positive outcomes (p <0.05) were observed among children in 50% (4/8) of studies and among FRA in 28.6% (2/7) of studies. In Ethiopia (Adish et al. 1999), positive effect on Hb and sf in children aged 2–5 y of iron vs. Aluminum pot. In Vietnam (Berti et al. (2004), Hb in women of reproductive age improved in group with blue steel or iron pots vs. Control, reduced in adolescent girls and infants 6-24 months. Sf increased in women of reproductive age and infants, reduced in adolescent girls. | Gender blind intervention; Gender blind analysis for children and impact specific for women and adolescent girls | X |
| B V + | *Hyder, S. M. Z., Haseen, F., Khan, M., Schaetzel, T., Jalal, C. S. B., Rahman, M., Lönnerdal, B., Mannar, V., & Mehansho, H. (2007). A multiple-micronutrient-fortified beverage affects hemoglobin, iron, and vitamin A status and growth in adolescent girls in rural Bangladesh. Journal of Nutrition, 137(9), 2147–2153. https://doi.org/10.1093/jn/137.9.2147* | Bangladesh | 2007 | Micronutrient-fortified beverage: The test beverages were consumed 6 days/week for 12 months at the schools. | Adolescent girls in rural Bangladesh in informal primary schools (i.e. For adolescent girls who have either withdrawn from the formal education system or never enrolled in school) | Randomized, double-blind, placebo-controlled trial, randomized at pupil level | Haemoglobin (Hb) and iron (sft) concentrations, micronutrient status, growth in weight, mid-upper arm circumference, BMI | The multiple-micronutrient-fortified beverage administered for 6 months significantly increased Hb concentration and improved iron (in terms of sft concentration) and vitamin A (in terms of serum retinol concentration) status in adolescent girls. The fortified beverage effectively decreased the prevalence of anaemia and iron deficiency. Furthermore, consumption of the fortified beverage was effective in preventing further development of anaemia and depletion of iron stores. Girls who consumed the fortified beverage had a higher mean increase in weight, mid-upper arm circumference, and BMI over 6 months compared with girls in the nonfortified beverage group (P = 0.01). | Girls targeted; Analysis of impact on girls only | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B V + | *Sazawal, S., Habib, A. A., Dhingra, U., Dutta, A., Dhingra, P., Sarkar, A., Deb, S., Alam, J., Husna, A., & Black, R. E. (2013). Impact of micronutrient fortification of yoghurt on micronutrient status markers and growth - A randomized double blind controlled trial among school children in Bangladesh. BMC Public Health, 13(1), 1–11. https://doi.org/10.1186/1471-2458-13-514* | Bangladesh | 2013 | Micronutrient fortified yoghurt (30% RDA of iron, zinc, vitamin A and iodine) for one year | School children in primary schools in Bangladesh | Double-masked randomized controlled trial (RANDOMISED CONTROL TRIAL), randomized at pupil level | Micronutrient status indicators (iron, zinc, vitamin A and iodine) and physical growth (height velocity and height-for-age z-score, weight gain velocity, weight-for-age z-score, BMI z-score) | Consumption of fortified yoghurt Did not result in improvement in iron status indicators. It significantly improved haemoglobin level, and a positive impact on iodine status indicated by significantly lower decline urinary iodine levels when compared to the non-fortified yoghurt group. One year of fortification resulted in an improvement in linear growth with a statistically significant change in height velocity and height-for-age z-score, also after correcting for baseline measurements. There was no difference in weight gain velocity, weight-for-age z-scores or BMI z-scores. | Gender blind intervention and analysis | X |
| B IV + | *Hotz, C., Kabir, K. A., Dipti, S. S., Arsenault, J. E., & Bipul, M. (2015). Rice fortification with zinc during parboiling may improve the adequacy of zinc intakes in Bangladesh. Journal of the Science of Food and Agriculture, 95(2), 379–385. https://doi.org/10.1002/jsfa.6730* | Bangladesh | 2015 | Fortification of rice through parboiling technique: zinc sulfate and iron–EDTA are added to the soaking water before parboiling, using local parboiling conditions | General population, particularly children and women who suffer from zinc and iron deficiencies | Simulation | Increase of zinc and iron in rice Dose-response effect on zinc content of increasing amounts of zinc in parboiling soaking water Simulated impact of parboiled fortified rice on the adequacy of dietary zinc intakes among Bangladeshi children and women | As compared to raw polished rice, fortification through parboiling increased 26.2mg/kg zinc (+-0.7mg/kg) and 13.4mg/kg iron (+-0.2mg/kg). The simulated prevalence of inadequate zinc intake was greatly reduced for children and women when applying the rice zinc content achieved with parboil zinc fortified rice at 300mg/l and 1300mg/l zinc by the hot soaked/closed parboil method. Even at an assumed coverage level of 50% of the population consuming this rice, the prevalence of inadequate zinc intake was reduced by more than half among children and by nearly two-thirds among women with the 1300mg/l zinc parboiled fortified rice. | Gender blind intervention; Analysis of impact on women only | X |
| B V +/- | *Rahman, A. S., Ahmed, T., Ahmed, F., Alam, M. S., Wahed, M. A., & Sack, D. A. (2015). Double-blind cluster randomised controlled trial of wheat flour chapatti fortified with micronutrients on the status of vitamin A and iron in school-aged children in rural Bangladesh. Maternal and Child Nutrition, 11, 120–131. https://doi.org/10.1111/mcn.12065* | Bangladesh | 2015 | Wheat flour chapatti fortified with micronutrients | School-aged children in households in a rural community in Bangladesh | Double-blind cluster randomised controlled trial at baris (group of households) level | Vitamin A status, iron, haemoglobin or anaemia status | Micronutrient-fortified wheat flour chapatti (flat bread) significantly increased serum retinol concentration at 6 months by 0.12mmol L-1[95% confidence interval (CI):0.06, 0.19;P<0.01]. The odds of vitamin A deficiency was significantly lower for intervention children at 3 months [odds ratio (OR)=0.26; 95% confidence interval (CI): 0.07, 0.89;P<0.05] and 6 months(OR=0.21; 95% CI: 0.06, 0.68;P<0.01). No demonstrable effect of fortified chapatti consumption on iron status, haemoglobin levels or anaemia was observed. Consumption of fortified chapattis demonstrated a significant improvement in the vitamin A status, but not in iron, haemoglobin or anaemia status. | Gender blind intervention; Gender aware analysis (controlled for sex of child) | X |
| B V + | *Adams, A. M., Ahmed, R., Mahbub Latif, A. H. M., Rasheed, S., Das, S. K., Hasib, E., Farzana, F. D., Ferdous, F., Ahmed, S., & Faruque, A. (2017). Impact of fortified biscuits on micronutrient deficiencies among primary school children in Bangladesh. PLoS ONE, 12(4), 1–16. https://doi.org/10.1371/journal.pone.0174673* | Bangladesh | 2017 | Fortified biscuits | Primary school children in rural disadvantaged sub-districts | Qualitative component explored the acceptability Before after comparison in control and treatment (Difference-in-Difference) to measure micronutrient impact | Qualitative: acceptability Quantitative: micronutrient impact indicators: iron, folic acid, vitaminb12, retinol and vitamin D | Qualitative findings indicated the widespread acceptability of the daily biscuit. Teachers perceived students to be more attentive in class and less tired. Some attributed better school performance to biscuit consumption. Children reported similar improvements in concentration and energy levels. Daily consumption of fortified biscuits by primary schoolchildren had a significant positive impact on mean level sf iron, folic acid, vitamin B12,retinol and vitamin D controlling for sex, baseline deficiency status, CRP, and H. pylori. Levels of anaemia and vitamin D deficiency were also significantly reduced. | Gender blind intervention; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B & N V + | *Aaron, G. J., Dror, D. K., & Yang, Z. (2015). Multiple-micronutrient fortified non-dairy beverage interventions reduce the risk of anemia and iron deficiency in school-aged children in low-middle income countries: A systematic review and meta-analysis. Nutrients, 7(5), 3847–3868. https://doi.org/10.3390/nu7053847* | Multiple (including Bangladesh, Nigeria) | 2015 | Fortification of beverages with multiple-micronutrient (MMN) | School aged children (5-13 years) | Systematic review and meta-analysis of randomised control trials | Haemoglobin (n= 9); ferritin (n= 9); retinol (n= 6); zinc(n= 4); vitamin B12 (n= 3); folate (n= 3); vitamin C (n= 2); riboflavin (n= 2); vitamin B6 (n= 1); thiamin (n= 1); niacin (n= 1); iodine (n= 1); anthropometry (n= 8); cognition (n= 3); and physical performance (height and weight gain, HAZ, WAZ) (n= 2). | Compared with controls, children who received MMN-fortified beverages for a duration of 8 weeks to 6 months demonstrated significantly greater improvements in circulating haemoglobin (+2.76g/L, 95%-CI [1.19,4.33], p= 0.004;8 studies) and ferritin (+15.42pmol/L, [5.73, 25.12], p= 0.007; 8 studies). No significant intervention effects were found for retinol (+0.05 µmol/L [−0.03, 0.13], p=0.16; 5 studies), zinc (+0.92µmol/L [−1.45, 3.30], p=0.30; 4 studies), or vitamin B12 (+96.2pmol/L [−142.2, 334.6], p=0.22; 3 studies). A moderate but significant effect was found for weight gain (+0.30kg [0.01,0.58], p=0.04; 6 studies), while neither height gain nor weight-for-age or height-for-age Z-scores differed significantly between groups (+0.17 cm [−0.16, 0.50], p=0.23, 5 studies; +0.028 [−0.06, 0.12], p= 0.40, 4 studies; and 0.0 [−0.05, 0.05], p=0.98, 3 studies respectively). | Gender blind intervention and analysis | X |
| N V 0 | *Aaron, G. J., Kariger, P., Aliyu, R., Flach, M., Iya, D., Obadiah, M., & Baker, S. K. (2011). A multi-micronutrient beverage enhances the vitamin A and zinc status of Nigerian primary schoolchildren. Journal of Nutrition, 141(8), 1565–1572. https://doi.org/10.3945/jn.110.136770* | Nigeria | 2011 | Multi-micronutrient beverage that included vitamin A, iron, and zinc (micronutrient) | Schoolchildren participating in a pilot school feeding program in Nasarawa State, Nigeria | 6-month, double-blind, placebo controlled trial, randomized at pupil level | Biochemical (haemoglobin, ferritin, retinol and zinc concentrations) and anthropometric indicators (BMI-for-age (BAZ), height-for-age (HAZ), and weight-for-age(WAZ) | Compared to control, biochemical changes were greater in the micronutrient group for serum retinol and zinc. The intervention Did not significantly affect haemoglobin or serum ferritin concentrations. There were no significant differences in weight gain, linear growth, or change in anthropometric indices during the 6-month intervention period. | Gender blind intervention and analysis | X |
| N II - | *Idowu-Adebayo, F., Fogliano, V., Oluwamukomi, M. O., Oladimeji, S., & Linnemann, A. R. (2020). Food neophobia among Nigerian consumers: a study on attitudes towards novel turmeric-fortified drinks. Journal of the Science of Food and Agriculture, 0–3. https://doi.org/10.1002/jsfa.10954* | Nigeria | 2020 | Familiar street vended soymilk drink and hibiscus drink fortified with turmeric (health benefits) (in varying concentrations). | General population in Akure, capital of Ondo State, South-West Nigeria | Regression: Correlation Like/dislike/won't try control and fortified and 1) concentration turmeric, 2) Food Attitude Scale (FAS) and 3) other individual characteristics | Food Neophobia: Scale Like/dislike/won't try and Food Attitude Scale (FAS) to measure individual attitudes to food and willingness to try novel foods | The likelihood of liking the fortified drinks is negatively correlated with the concentration of turmeric. There is a positive correlation between the likelihood of disliking and not willing to try and being male, being aged between 26 and 35 years, having middle class income and having a university degree. There is a positive correlation between the likelihood of liking and being between 50 and 75 years old, possibly because of greater awareness of health benefits of turmeric. | Gender blind intervention; Gender aware analysis (controlled for sex of child) | X |
| V V + | *Van Thuy, P., Berger, J., Nakanishi, Y., Khan, N. C., Lynch, S., & Dixon, P. (2005). The use of NaFeEDTA-fortified fish sauce is an effective tool for controlling iron deficiency in women of childbearing age in rural Vietnam. Journal of Nutrition, 135(11), 2596–2601. https://doi.org/10.1093/jn/135.11.2596* | Vietnam | 2005 | Nafeedta-fortified fish sauce [9 mmol (500mg)/Fe/L] | General population in sites with a high prevalence of anaemia (>20%): effects in women of childbearing age in rural Vietnam | Randomized double-blind trial with randomization by village | Haemoglobin and serum ferritin (SF) at 6, 12, and 18 months | There was significant effect of fortification on haemoglobin and log SF in the group with free fortified fish sauce and no significant effect in the group with free non-fortified fish sauce. The prevalence of iron deficiency decreased from 22.3% to 4.0% and the prevalence of anaemia (haemoglobin < 120 g/L) from 24.7 to 8.5% in the treatment group while there were no significant changes in the control group. Most of the improvement in iron status occurred within the first 12 months in the trial. | Gender blind intervention; Analysis of impact on women only | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| V V + | *Nga, Tran Thuy, Winichagoon, P., Dijkhuizen, M. A., Khan, N. C., Wasantwisut, E., Furr, H., & Wieringa, F. T. (2009). Multi-micronutrient-fortified biscuits decreased prevalence of anemia and improved micronutrient status and effectiveness of deworming in rural Vietnamese school children. Journal of Nutrition, 139(5), 1013–1021. https://doi.org/10.3945/jn.108.099754* | Vietnam | 2009 | Micronutrient–fortified biscuits, with or without deworming, given 5 days/week for 4 months. | Rural Vietnamese school children 6-8 years in primary schools | Randomized, double-blind, placebo-controlled trial | Anaemia and micronutrient status | Multi-micronutrient fortification significantly improved the concentrations of haemoglobin (11.87 g/L; 95% CI: 0.78, 2.96), plasma ferritin (17.5mg/L; 95% CI: 2.8, 12.6),body iron (10.56 mg/kg body weight; 95% CI: 0.29, 0.84), plasma zinc (10.61mmol/L; 95% CI: 0.26, 0.95), plasma retinol(10.041mmol/L; 95% CI: 0.001, 0.08), and urinary iodine (122.49mmol/L; 95% CI: 7.68, 37.31). Fortification reduced the risk of anaemia and deficiencies of zinc and iodine by > 40%. Parasitic infestation Did not affect fortification efficacy, whereas fortification significantly enhanced deworming efficacy. | Gender blind intervention and analysis | X |
| V V + | *Casey, G. J., Tinh, T. T., Tien, N. T., Hanieh, S., Cavalli-Sforza, L. T., Montresor, A., & Biggs, B. A. (2017). Sustained effectiveness of weekly iron-folic acid supplementation and regular deworming over 6 years in women in rural Vietnam. PLoS Neglected Tropical Diseases, 11(4), 1–14. https://doi.org/10.1371/journal.pntd.0005446*<br>*Casey, G. J., Sartori, D., Horton, S. E., Phuc, T. Q., Phu, L. B., Thach, D. T., Dai, T. C., Fattore, G., Montresor, A., & Biggs, B. A. (2011). Weekly iron-folic acid supplementation with regular deworming is cost-effective in preventing anaemia in women of reproductive age in Vietnam. PLoS ONE, 6(9), 7–11. https://doi.org/10.1371/journal.pone.0023723* | Vietnam | 2017 | Weekly iron-folic acid supplementation + deworming | Women of childbearing age in rural Vietnam | Before-after study: prospective cohort study (baseline and five follow-up surveys) | Haemoglobin and ferritin, anaemia prevalence, hookworm infection of Soil-transmitted helminthiasis (STH) | After 12 months of the project mean haemoglobin increased from 122 g/L to 130g/L, the prevalence of anaemia decreased from 38% to 20% and the prevalence of hookworm infection decreased from 76% to 22%. During a six-year period, anaemia prevalence fell from 37.8% to 14.3% , and haemoglobin levels increased from 122 g/L to 135g/L. STH infections were essentially eliminated as a public health risk. | Women targeted; Analysis of impact on women only | X |
| V V + | *Nga, Tran T., Nguyen, M., Mathisen, R., Hoa, D. T. B., Minh, N. H., Berger, J., & Wieringa, F. T. (2013). Acceptability and impact on anthropometry of a locally developed Ready-to-use therapeutic food in pre-school children in Vietnam. Nutrition Journal, 12(1), 1–8. https://doi.org/10.1186/1475-2891-12-120* | Vietnam | 2013 | Peanut-based Ready-to-Use-Therapeutic-Foods (RUTF) (locally produced high energy bar and commercial commercially available, peanut-based RUTF paste (Plumpy'nut) | Children 3-5 years of age in Kindergarten | Acceptability trial : randomized, cross-over designed study in which children received both products subsequently for 2 weeks, two times per school day. | Organoleptic qualities (colour, smell, taste, palatability and hardness); acceptability and overall acceptance; weight, height and mid upper arm Circumference (MUAC) | The Vietnamese RUTF was well-accepted, although overall acceptability was less than of Plumpy'nut®, with the latter scoring higher on palatability ($P < 0.05$). In contrast, reluctance to eat Plumpy'nut® was higher than for the Vietnamese RUTF ($P < 0.05$). Impact on anthropometrical indices was similar for both RUTF. The nutritional status of the children who consumed the two RUTF over a 4 week period improved significantly, with a mean weight gain of 0.64 (SD 0.27) Kg, and increases in WHZ and HAZ z-scores of 0.48 (SD 0.30) and 0.05 (SD 0.13) respectively ($P < 0.01$ both). Weight gain was similar between the 2 products (0.32 kg per 2 weeks for both). | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| V V + | *Le, H. T., Brouwer, I. D., Nguyen, K. C., Burema, J., & Kok, F. J. (2007). The effect of iron fortification and de-worming on anaemia and iron status of Vietnamese schoolchildren. British Journal of Nutrition, 97(5), 955–962. https://doi.org/10.1017/S0007114507659029* | Vietnam | 2007 | Iron fortification and de-worming | Children aged 6–8 years | 2 x 2 factorial design randomly assigned to receive either iron-fortified noodles or placebo, and mebendazole (deworming medicine) or placebo. | Haematological indicators of iron status (Hb, serum ferritin (SF), serum transferrin receptor (tfr) and haemoglobinopathies analysis); anaemia; inflammations (C-reactive protein (CRP)); parasite infection status (hookworm, Trichuris and Ascaris infection); and Immunoglobulin E (ige) | Hb improved in all groups after 6 months of intervention. Iron fortification significantly improved iron status (Hb), serum ferritin (SF), and body iron.<br>Prevalence of elevated Immunoglobulin E was significantly reduced from 99% at baseline to about 75% in all groups after intervention.<br>De-worming unexpectedly showed no effect on Hb, iron status and Immunoglobulin E level.<br>Iron fortification slightly improved anaemia and iron status in anaemic schoolchildren in rural Vietnam that were not considered iron deficient. Chronic infection or other unidentified factors may play an important role in the seasonal reduction of anaemia seen in all treatment groups. | Gender blind intervention; Gender aware analysis (controlled for sex of child) | X |
| V V + | *Lien, D. T. K., Nhung, B. T., Khan, N. C., Hop, L. T., Nga, N. T. Q., Hung, N. T., Kiers, J., Shigeru, Y., & Biesebeke, R. (2009). Impact of milk consumption on performance and health of primary school children in rural Vietnam. Asia Pacific Journal of Clinical Nutrition, 18(3), 326–334. https://doi.org/10.6133/apjcn.2009.18.3.04* | Vietnam | 2009 | Provision of regular milk and milk fortified with mineral, vitamins and inulin for 6 months | Children aged 7-8 years in North Vietnam | Double blind intervention | Food intake (energy, protein, fat, sugar, iron, vitamin A)<br>Anthropometrics: weigh, height, WAZ-score, WHZ-score, HAZ-score<br>Incidence of anaemia<br>Micronutrient (retinol, ferritin, zinc, iodine) deficiency status<br>Faecal bacteria levels<br>Self-reported health related quality of life<br>School performance (work volume and work efficiency) | Consuming two cartons of milk increased the daily energy intake by more than 20%, and daily protein intake by almost 40%. Milk fortification led to significant increases in iron (4.9 mg/day) and vitamin A (0.41 mg/day) intake. Both WAZ-score and HAZ-score significantly improved during six months of milk intervention and the incidence of under-weight and stunting dropped by roughly 10%. The incidences of anaemia decreased significantly in all groups, and strongest for the fortified milk group. The serum ferritin levels increased significantly in both groups consuming milk. Urine iodine levels increased only upon intervention with fortified milk. The faeces of the children in the fortified milk group contains significantly higher numbers of total bacteria, bifido bacteria and Bacteroides species compared to that of regular milk consuming children. Children in the milk consuming groups had significantly better short-term memory scores. Reported health related quality of life status significantly improved upon milk intervention. | Gender blind intervention and analysis | X |
| O III + | *De Groote, H., Kariuki, S. W., Traore, D., Taylor, J. R. N., Ferruzzi, M. G., & Hamaker, B. R. (2018). Measuring consumers' interest in instant fortified pearl millet products: a field experiment in Touba, Senegal. Journal of the Science of Food and Agriculture, 98(6), 2320–2331. https://doi.org/10.1002/jsfa.8722* | Senegal | 2017 | Instant fortified pearl millet products (1) instant pearl millet flour, 2)instant pearl millet flour flavoured with dry mango and carrot powder, 3) 2+ chemical micronutrient fortificants, 4) 2 + natural micronutrient fortificants) | Consumers in Touba, a regional capital in Senegal. | Affective tests and experimental auctions 'willingness to pay' (WTP) (Becker–degroot–Maschak (BDM)) of four new products vs conventional (non-instant) pearl millet flour as control | Appearance, aroma, taste and overall appreciation; willingness to pay | Without providing additional information on the products, there was no difference in 'willingness to pay' (WTP) between products; without information men generally have a higher WTP than women. After providing information about product's composition, consumers were willing to pay a modest premium for instant flour, and a large premium for added mango and carrot extract and for added micronutrients, but were not willing to pay a premium if those micronutrients came from natural sources. When information is provided straight away, there is a premium for instant flour for both men and women; and a premium for added micronutrients, regardless of being natural or chemical. Income increased overall WTP, while education increased WTP for instant flour. | Gender blind intervention; Gender disaggregated analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| | **Consumer Behaviour – Policy / Regulations** | | | | | | | | | |
| | **I. Unhealthy food taxes and healthy food subsidies** | | | | | | | | | |
| V III + | *Luong, L., & Vu, L. H. (2020). Impacts of excise taxation on non-alcoholic beverage consumption in Vietnam. Sustainability, 12(3), 1–13. https://doi.org/10.3390/su12031092* | Vietnam | 2020 | Tax on sugar-sweetened beverages (SSB) | General population Vietnam | Almost ideal demand System (AIDS) model for estimation of elasticity of SSB | Estimated effects of tax based on price elasticity and expenditure elasticity of sugar-sweetened beverages | A 10% special consumption tax on SSB in Vietnam is projected to reduce SSB consumption by 11.4%. Consumers will switch to substitutes, leading to an increase in the consumption of milk by 2.3%, beer by 2.5%, dried tea by 2.2%, and wine by 1.7%. In the short run, the tax could lead to a decrease in consumer welfare due to higher SSB prices, in particularly for people from better-off households and people from the ethnic majority group, most of which live in urban areas with a large number of children. | Gender blind intervention and analysis | X |
| V III - | *Schram, A., Labonte, R., Baker, P., Friel, S., Reeves, A., & Stuckler, D. (2015). The role of trade and investment liberalization in the sugar-sweetened carbonated beverages market: A natural experiment contrasting Vietnam and the Philippines. Globalization and Health, 11(1), 1–13. https://doi.org/10.1186/s12992-015-0127-7* | Vietnam | 2015 | Sales of sugar sweetened carbonated beverages after Vietnam's removal of restrictions on foreign direct investment (FDI) subsequent to its accession to the World Trade Organization in 2007 | General population Vietnam | Using a natural experimental design: Difference-in-difference to test pre/post differences in total SSCB sales in Vietnam (removal of restrictions on foreign direct investment (FDI) subsequent to its accession to the World Trade Organization in 2007) vs the Philippines, which acceded in 1995. | Total SSCB sales | Average per capita sales of sugar sweetened carbonated beverages (SSCBs) in Vietnam rose from 1.9 (95 % CI: 1.6 to 2.2) to 3.9 L (95 % CI: 3.4 to 4.3) post-intervention. Over the same period, per capita sales in the Philippines dropped from 28.7 (95 % CI: 28.4 to 29.0) to 26.1 L (95 % CI: 25.6 to 26.6). The difference-in-difference model revealed a significant difference between the two countries pre- and post-intervention (4.6 L, 95 % CI: 3.8 to 5.4, p = 0.008) that was robust to adjustments for GDP and underlying time trends. Substantial sales growth in SSCBs in Vietnam post-intervention, with a growth rate of 12.1 % (95 % CI:11.1 to 13.1) relative to the prior growth rate of 3.3 % (95 % CI: 2.7 to 4.0); while sales growth in the unprocessed food category remained largely unaffected, with a post-intervention rate of 2.1 % (95 % CI: 1.1 to 3.1) and a 2.2 % growth rate prior (95 % CI: 1.6 to 2.9). | Gender blind intervention and analysis | X |
| O V - | *Asfaw, A. 2007). Do Government Food Price Policies Affect the Prevalence of Obesity? Empirical Evidence from Egypt. World Development, 35(4), 687–701. https://doi.org/10.1016/j.worlddev.2006.05.005* | Egypt | 2007 | Food subsidy program: bread, wheat flour, sugar, and cooking oil at a subsidized price | General population Egypt | Regression: Based on the 1997 Egyptian Integrated Household Survey and controlling for other factors such as age, income and urban residence | Obesity prevalence among mothers, mother's weight, mother's body mass index (BMI) | Mother's body mass index (BMI) was negatively related with prices of energy-dense subsidized food items and positively related with prices of energy-dilute nutrient-dense expensive (non-subsidized) food items. A 1% increase in the price of subsidized bread per 100 calories would be associated with a 0.12% decrease of mother's BMI, ceteris paribus, a 1% increase in the price of subsidized sugar per 100 calories with a 0.11% decrease. For nutrient-dense food items such as fruits, eggs or milk, a 1% increase in the price per 100 calories would be associated with an increases of mother's BMI between 0.09 and 0.14%. The food subsidy program reduces the per-calorie prices of food items that contain disproportionately high amounts of carbohydrates but inadequate amounts of essential micronutrients in relation to other nutrient-dense diets. Households substitute expensive and energy-dilute nutrient-dense foods with cheap and energy-dense but nutrient-dilute foods to meet their daily energy requirements at lower costs. | Gender blind intervention; Analysis of impact on women only | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O III + | *Colchero, M. A., Rivera-Dommarco, J., Popkin, B. M., & Ng, S. W. (2017). In mexico, evidence of sustained consumer response two years after implementing a sugar-sweetened beverage tax. Health Affairs (Project Hope), 36(3), 564–571. https://doi.org/10.1377/hlthaff.2016.1231*<br>*and*<br>*Colchero, M. A Popkin, B. M., Rivera, J. A., & Ng, S. W. (2016). Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: Observational study. BMJ (Online), 352, 1–9. https://doi.org/10.1136/bmj.h6704* | Mexico | 2017 | Excise tax on sugar sweetened beverages | General population Mexico | Compare post-tax purchases with predicted purchases had tax not been implemented based on pre-tax trends, controlling for inflation and time variant household characteristics using fixed-effects models. | Household's store purchases of taxed and untaxed beverages | Evidence for 2014 showed that on average in urban areas, the 1-peso-per-liter tax starting in January 2014 was fully passed on to consumers through increased prices. The study found significant declines in the taxed beverages purchased by households at all socioeconomic levels. The reduction in taxed beverage purchases was larger in 2015 than in 2014 (9.7% and 5.5 %, respectively). Reductions in absolute and relative terms were largest among households at the lowest level (declines of 18.8 ml per capita per day in 2014 and of 29.3 ml per capita per day in 2015). The differences across socioeconomic levels were significant. For untaxed beverages, households at the middle socioeconomic level had the largest increase in purchases in 2014. | Gender blind intervention and analysis | X |
| O III + | *Ng, S. W., Rivera, J. A., Popkin, B. M., & Colchero, M. A. (2019). Did high sugar-sweetened beverage purchasers respond differently to the excise tax on sugar-sweetened beverages in Mexico? Public Health Nutrition, 22(4), 750–756. https://doi.org/10.1017/S136898001800321X* | Mexico | 2018 | Excise tax on sugar sweetened beverages | General population Mexico | Compare post-tax purchases with predicted purchases had tax not been implemented based on pre-tax trends | Household's store purchases per type of households that buy: (i) relatively high share of purchases of taxed beverages and low purchases of untaxed beverages (HTLU-unhealthier); (ii) high purchases of both types of beverages (HTHU); (iii) low purchases of taxed and untaxed beverages (LTLU); and (iv) low purchases of taxed beverages and high purchases of untaxed beverages (LTHU-healthier) | Types of households that initially (pre-tax) had relatively high share of purchases of taxed beverages and low purchases of untaxed beverages (HTLU-unhealthier) and high purchases of both types of beverages had the largest absolute and relative reductions in taxed beverages and increased their purchases of untaxed beverages. Types of households with lower purchases of untaxed beverages (both types with low and high purchases of taxed beverages) had the largest absolute and relative increases in untaxed beverages. It was also found that among types of households with initial higher purchases of taxed beverages, the group with lowest socio-economic status had the greatest reduction in purchases of taxed beverages. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O III + | *Batis, C., Rivera, J. A., Popkin, B. M., & Taillie, L. S. (2016). First-Year Evaluation of Mexico's Tax on Nonessential Energy-Dense Foods: An Observational Study. PLoS Medicine, 13(7), 1–14. https://doi.org/10.1371/journal.pmed.1002057* | Mexico | 2016 | 8% tax on nonessential foods with energy density >275 kcal/100 g and a peso-per-litre tax on sugar-sweetened beverages | General population Mexico | Compare post-tax purchases with predicted purchases had tax not been implemented based on pre-tax trends, correcting for inflation, unemployment, minimum salary and household level changes. | Changes in volume of taxed and untaxed packaged food purchases by households in urban settings | Taxed foods included in the analysis are salty snacks, cereal-based sweets, ready-to-eat cereals, and non-cereal-based sweets. The mean volume of purchases in 2014 decreased by 25g per capita per month, which represents a 5.1% decrease beyond what would have been expected based on pre-tax (2012–2013) trends. No changes are detected in volumes of purchases of untaxed foods. Households with low socio-economic status purchased on average 44 g per capita (10.2%) less taxed foods than they would have without tax. Households with medium socio-economic status purchased 28g per capita (5.8%) less taxed foods. Purchases of taxed foods by household with high socio-economic status Did not change. Among untaxed foods, except for sugar and sugar substitutes, the volumes purchases Did not significantly changed. For sugar and sugar substitutes, the upward trend in the volume of sugar and sugar substitutes observed pre-tax continued post-tax, but at a slower rate. | Gender blind intervention and analysis | X |
| O III + | *Caro, J. C., Corvalán, C., Reyes, M., Silva, A., Popkin, B., & Taillie, L. S. (2018). Chile's 2014 sugar-sweetened beverage tax and changes in prices and purchases of sugar-sweetened beverages: An observational study in an urban environment. PLoS Medicine, 15(7), 1–19. https://doi.org/10.1371/journal.pmed.1002597* | Chile | 2018 | Chile's changed sugar sweetened beverage tax rates (tax increased from 13% to 18% for high levels of sugar (> 6.25 grams [g] sugar/100 millilitres [ml]) and tax decreased from 13% to 10% for low or no sugar(< 6.25 g sugar/100 ml). | General population Chile | Compare post-tax purchases with predicted purchases had tax not been implemented based on pre-tax trends | Changes in prices and purchases of sugar-sweetened beverages | In 2014, the Chilean government modified its previous sugar sweetened beverages (SSBs) tax, increasing the tax rate from 13% to 18% on industrialized beverages with high levels of sugar (H- SSBs) and decreasing the tax rate from 13% to 10% on industrialized beverages with low or no sugar (L- SSBs). Post-tax monthly prices of H- SSBs slightly increased. Prices of carbonated H- SSBs increased by 2.0%, those of noncarbonated H- SSBs increased by 3.9%. Prices of L- SSBs concentrates decreased after the tax by 6.7% and prices of ready-to-drink L- SSBs increased by 1.5%. Households decreased monthly per capita purchases of H- SSBs by 3.4% by volume and 4.0% by calories, and this change was greater among high socioeconomic status households. The volume of household purchases of L- SSBs increased 10.7%, while that of untaxed beverage purchases decreased by 3.1. Small increases in SSBs taxes are unlikely to promote large enough changes in SSBs purchases to reduce obesity and non-communicable diseases. | Gender blind intervention and analysis | X |
| O III + | *Nakamura, R., Mirelman, A. J., Cuadrado, C., Silva-Illanes, N., Dunstan, J., & Suhrcke, M. (2018). Sugar-sweetened beverage (SSB) tax-Chile. PLOS Medicine, 15(7), e1002596. https://doi.org/10.1371/journal.pmed.1002596* | Chile | 2018 | Chile's changed sugar-sweetened beverage tax rates (tax increased from 13% to 18% for high levels of sugar (> 6.25 grams [g] sugar/100 millilitres [ml]) and tax decreased from 13% to 10% for low or no sugar(< 6.25 g sugar/100 ml). | General population Chile | Before-after using household fixed effects and controlling for time trend and seasonality of the outcome variables | Changes in prices and purchases of 'low-tax', 'hihg-tax', and 'no-tax' sugar-sweetened beverages products | The introduction of the changed tax rates for sugar sweetened beverages (SSBs) high and low on sugar in Chile is associated with a significant, sizeable reduction in the volume of high-tax soft drinks purchased (21.7%), which was also reflected in a decrease in the amount of purchased added sugar from soft drinks (15.1%). There were no consistent associations between the tax implementation and the purchased volume of low-tax soft drinks. For the volume of high-tax items purchased, the magnitude of reduction was larger for the high-socio-economic-status (SES) group than for the middle-SES group and statistically insignificant for the low-SES group. All groups responded to the tax by cutting down their purchasing of high-tax soft drinks. | Gender blind intervention and analysis | X |
| O III + | *Teng, A. M., Jones, A. C., Mizdrak, A., Signal, L., Genç, M., & Wilson, N. (2019). Impact of sugar-sweetened beverage taxes on purchases and dietary intake: Systematic review and meta-analysis. Obesity Reviews, 20(9), 1187–1204. https://doi.org/10.1111/obr.12868* | Multiple (including Chile and Mexico) | 2019 | Sugar-sweetened beverage tax | General population western countries (USA, Europe), Chile and Mexico | Systematic review and meta-analysis of pre-post or with-without analysis of sugar-sweetened beverage tax in a distinct local or central government jurisdiction | Sales, purchasing, and dietary intake of taxed sugar-sweetened beverages | This examination of 17 real-world SSB tax evaluations through meta-analysis presents compelling evidence that SSB taxes are associated with decreased sales, purchasing, and dietary intake of taxed beverages. For a 10% SSB tax (with volumetric taxes charged at a per volume value transformed into ad valorem equivalent), SSB volumes declined an average 10.0%, equating to a tax elasticity of -1.00. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| | **II. Cash and/or in kind transfers** | | | | | | | | | X |
| EV0 | ***UNICEF, MOLSA and IFPRI (2020). Impact Evaluation of Improved Nutrition through Integrated Basic Social Services and Social Cash Transfer Pilot Program (IN-SCT) in Oromia and SNNP Regions, Ethiopia: End-line Impact Evaluation Report (by Daniel O. Gilligan, Alejandra Arrieta, Stephen Devereux, John Hoddinott, Dereje Kebede, Natasha Ledlie, Keetie Roelen, Alemayehu Seyoum Taffesse) https://www.unicef.org/ethiopia/media/3426/file/Impact%20Evaluation%20of%20Improved%20Nutrition%20through%20Integrated%20Basic%20Social%20Services%20and%20Social%20Cash%20Transfer%20Pilot%20Program%20(IN-SCT)%20in%20Oromia%20and%20SNNP%20Regions,%20Ethiopia.pdf Gilligan, D. O., Arrieta, A., Hoddinott, J., Devereux, S., Kebede, D., Ledlie, N., Roelen, K., & Taffesse, A. S. (2019). The impact of nutrition-sensitive social cash transfers on diets, food security and nutrition in Ethiopia. https://www.slideshare.net/essp2/the-impact-of-nutritionsensitive-social-cash-transfers-on-diets-food-security-and-nutrition-in-ethiopia*** | Ethiopia | 2020 | Nutrition-sensitive social cash transfer: Improved Nutrition through Integrated Basic Social Services and Social Cash Transfer Pilot Program (IN-SCT) to support and enhance implementation of the Productive Safety Net Program (PSNP4) by providing an integrated package of multisectoral nutrition services and activities to strengthen quality of health services | Oromiya, Southern Nations Nationalities and Peoples Region (SNNP): permanent direct support clients, temporary direct support clients (pregnant and lactating mothers), public work clients for behavioural change communication | Impacts of IN-SCT and PSNP programs using covariate matching nearest neighbour (for SNNP2 panel HH with children <5) and propensity score matching (for SNNP1 pregnant/lactating mother-child) comparing outcomes between beneficiaries (i) of combined IN-SCT and PSNP, (ii) of PSNP alone, (iii) not participating in either IN-SCT or PSNP. Plus midline qualitative assessment | Child anthropometric indicators (height-for-age z-scores (HAZ), stunting prevalence (HAZ<-2), weight-for-height z-scores (WHZ), wasting prevalence (WHZ<-2), weight-for-age z-scores (WAZ) and underweight prevalence (WAZ<-2)); mother's nutrition knowledge; household dietary diversity | IN-SCT increased the household diet diversity HDDS by 1.05 food groups (initial at baseline 3.35). The project had no impact on minimum dietary diversity score for women (WDDS-M). IN-SCT led to a significant increase in women's nutrition knowledge scores. However, in the sample of households with children age 6-23 months old or pregnant and lactating women, it Did not improve women's nutrition knowledge. IN-SCT had no impact on the proportion of children receiving a minimum acceptable diet or on the proportion of children with a minimum dietary diversity. IN-SCT had no impact on child anthropometry, except for an unexplained statistically significant negative impact on HAZ. | Instrumental focus on women or women's empowerment ; Gender blind analysis | X |
| EV0 | ***Berhane, G., Hoddinott, J., Kumar, N., & Margolies, A. (2017). The impact of Ethiopia's Productive Safety Net Programme on the nutritional status of children: 2008–2012. ESSP Working Paper 99. Washington, D.C. and Addis Ababa, Ethiopia: International Food Policy Research Institute (IFPRI) and Ethiopian Development Research Institute (EDRI). http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/131051*** | Ethiopia | 2017 | Productive Safety Net Programme PSNP direct cash/food transfers and transfer for work | Food-insecure population in chronically food-insecure woredas in Ethiopia: children aged 6 months to 5 years | Matching Methods, Including Inverse-Probability-Weighted Regression-Adjustment Estimators and Woreda fixed effects | Anthropometric measures of children aged 6 months to 5 years (height-for-age z-score (HAZ), weight-for-height z-score (WAZ) | PSNP participation Did not have an effect on chronic undernutrition as measured by HAZ or stunting. No effects are found in any survey round, neither in the full sample nor when disaggregate by age or sex. These non-results are robust to changes in model specification. Impact models using instrumental variables regressions (instrumenting the real level of payments) and woreda fixed effects regressions Did not provide any evidence of impact either. Further, there is no evidence that the PSNP improves acute undernutrition as measured by WHZ or wasting. | Gender blind intervention; child sex disaggregated analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| E V + | *Porter, C., & Goyal, R. (2016). Social protection for all ages? Impacts of Ethiopia's Productive Safety Net Program on child nutrition. Social Science and Medicine, 159, 92–99. https://doi.org/10.1016/j.socscimed.2016.05.001* | Ethiopia | 2016 | Productive Safety Net Programme PSNP direct cash/food transfers and transfer for work. | Food-insecure population in chronically food-insecure woredas in Ethiopia: children at different ages (from age 3 to 5; age 5 to 8; and age 12 to 15 | Cohort study that collected data both pre-and post Program implementation in 2002, 2006 and 2009: matching and Difference-in-difference at child level (for index children), and for younger siblings | Anthropometric measures of children (height-for-age z-score (HAZ), weight-for-height z-score (WAZ) | Difference-in-difference estimates, controlled for children's age and gender, show a positive effect of PSNP between 0.13 and 0.18 (with more controls) standard deviations on children's height-for-age z-scores. The latter is equivalent to approximately 2.4 cm for 8 year old boys. The difference between the 25th and 50th%iles of z-scores in 2009 is 0.68 SD, potentially large effects of up to 3.5 cm in height. The change in WAZ was not statistically significant. | Gender blind intervention and analysis (control for child sex) | X |
| E V + | *Debela, B. L., Shively, G., & Holden, S. T. (2015). Does Ethiopia's Productive Safety Net Program improve child nutrition? Food Security, 7(6), 1273–1289. https://doi.org/10.1007/s12571-015-0499-9* | Ethiopia | 2015 | Productive Safety Net Programme PSNP direct cash/food transfers and transfer for work | Food-insecure population in chronically food-insecure woredas in Ethiopia: children <5 years | Exogenous switching regression t-test of differences in predicted outcomes from the separate regressions Between members And non-members. Treatment effects after exogenous switching regression | Weight-for-height z-scores | Differential impacts of household characteristics on the weight-for-height Z-scores of children in PSNP member and non-member households at short term. Children in member households had weight-for-height Z-scores that were 0.55 points higher than those of children in non-member households. In member households, there is a positive correlation between female labour supply and WHZ but not for non-member households. This implies there is no observable income-nutrition trade off when underutilized female labour is allocated to a food for work program. In member households, girls are better nourished, in non-member households boys have higher average WHZ. | Gender blind intervention; child sex disaggregated analysis | X |
| B V + | *Ahmed, A. U., Quisumbing, A. R., & Hoddinott, J. F. (2007). Relative efficacy of food and cash transfers in improving food security and livelihoods of the ultra-poor in Bangladesh. Dhaka: WFP, World Food Programme. http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=CED7E90551724406B9C613AE802561F8?doi=10.1.1.609.1990&rep=rep1&type=pdf Ahmed, A. U., Quisumbing, A. R., Nasreen, M., Hoddinott, J., & Bryan, E. (2009). Comparing Food and Cash Transfers to the Ultra-Poor in Bangladesh. IFPRI Research Monograph 163. Washington D.C.: International Food Policy Research Institute. https://doi.org/10.2499/9780896291737RR163* | Bangladesh | 2007 | Food and cash transfers: IGVGD= food transfer and credit for poor women, FSVGD= food and cash for poor women; FFA=food and cash for public works (70% women); RMP= cash for work for women | Ultra-poor in rural Bangladesh, mostly women receive transfers | Propensity score matching | Caloric intake of children aged 1–5, adult women aged 16–49, adult men aged 16–49; women's body mass index; three indicators of nutritional status of children aged 6 to 60 months: height-for-age, weight-for-height, and weight-for-age. | Participation by an adult female in any of these programs does not lead to increased caloric intakes of preschool children. The cash-only program RMP, which provides transfers in amounts about 70% higher than IGVGD program (food transfer and credit for poor women) and FSVGD program (food and cash for poor women), increases the caloric intakes of school-age and older persons. The food interventions that provide rice (IGVGD program and FFA program(food and cash for public works)) have a larger effect on men's caloric intake relative to women's, whereas the converse is true for the one intervention that provides atta flour (FSVGD), which is a less preferred food. The RMP has equally large positive effects on caloric intake by men and women. Women's body mass index is higher due to FSVGD participation. There are no significant effects of households' participation in IGVGD, FSVGD, and RMP on children's (6-60 months) height-for-age, weight-for-height and weight-for-age. | Women targeted; Gender disaggregated analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B V + | *Mascie-Taylor, C. G. N., Marks, M. K., Goto, R., & Islam, R. (2010). Impact of a cash-for-work programme on food consumption and nutrition among women and children facing food insecurity in rural Bangladesh. Bulletin of the World Health Organization, 88(11), 854–860. https://doi.org/10.2471/BLT.10.080994* | Bangladesh | 2010 | Cash for work | Char dwellers (i.e. Living on river islands): men and women | Difference-in-Difference | Height, weight and mid-upper arm circumference of one woman and child aged less than 5 years; children's anthropometrics; food expenditures and consumption | By the study end, the difference in mean mid-upper arm circumference between women in the intervention and control groups had widened by 2.29 mm and the difference in mean weight, by 0.88 kg. Among children, the difference in means between the two groups had also widened in favour of the intervention group for: height (0.08 cm; P < 0.05), weight (0.22 kg; P < 0.001), mid-upper arm circumference (1.41 mm; P < 0.001) and z-scores for height-for-age (0.02; P < 0.001), weight-for-age (0.17; P < 0.001), weight-for-height (0.23; P < 0.001) and mid-upper arm circumference (0.12; P < 0.001). Intervention households spent more on food and consumed more protein-rich food. Consumption of eggs, meat, fish, pulses, green leafy vegetables, milk and fruit was significantly greater among children from intervention households. | Gender blind intervention and woman specific analysis (but not for children) | X |
| B III + | *Hoddinott, J., Ahmed, A., & Roy, S. (2018). Randomized control trials demonstrate that nutrition-sensitive social protection interventions increase the use of multiple-micronutrient powders and iron supplements in rural pre-school Bangladeshi children. Public Health Nutrition, 21(9), 1753–1761. https://doi.org/10.1017/S1368980017004232* | Bangladesh | 2018 | Cash transfers, food transfers, cash and food transfers, cash and nutrition behaviour change communication (BCC), and food and nutrition BCC | Transfer recipients were mothers living in poor households with at least one child aged less than 2 years | Two randomized controlled trials with treatment arms including cash transfers, food transfers, cash and food transfers, cash and nutrition behaviour change communication (BCC), and food and nutrition BCC were implemented over two years. Control group that received no transfer or BCC | Mothers' knowledge of Fe deficiency; awareness of multiple micronutrient powders (MMP); children 6–59 months consumed MMP or an iron supplement in preceding week | A transfer and nutrition BCC increased the share of mothers with knowledge of Fe deficiency (11.9 and 9.2 percentage points for North and South, respectively, P ≤0.01), maternal awareness of MMP (29.0 and 22.2 percentage points, P≤0·01), the likelihood that their children 6–59 months had ever consumed MMP (32 and 11.9 percentage points, P≤0.01), consumed MMP in the preceding week (16.9 and 3.9 percentage points, P≤0.01) and consumed either MMP or an Fe supplement. | Instrumental focus on women or women's empowerment ; Gender blind analysis | X |
| B V + | *Ahmed, A., Hoddinott, J., & Roy, S. (2019). Food transfers, cash transfers, behavior change communication and child nutrition: Evidence from Bangladesh. IFPRI Discussion Paper 1868. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133420* | Bangladesh | 2019 | Cash transfers, food transfers, cash and food transfers, cash and nutrition behaviour change communication (BCC), and food and nutrition BCC | Transfer recipients were mothers living in poor households with at least one child aged less than 2 years | Two randomized controlled trials with treatment arms including cash transfers, food transfers, cash and food transfers, cash and nutrition behaviour change communication (BCC), and food and nutrition BCC were implemented over two years. Control group that received no transfer or BCC | Height-for-age z score, weight-for-height z score; children's diet diversity, illness (fever; cough or cold; diarrhoea) in previous 2 weeks | Only cash plus nutrition BCC had a significant impact on nutritional status, but its effect on height-for-age z scores (HAZ) was large, 0.25SD.<br>Improved diets – including increased intake of animal source foods – along with reductions in illness in the cash plus BCC treatment arm are consistent with the improvement observed in children's HAZ. | Instrumental focus on women or women's empowerment ; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| N IV + | *USAID (2018). Review of Food for Peace Market-Based Emergency Food Assistance Programs Nigeria Case Study Report. https://reliefweb.int/sites/reliefweb.int/files/resources/pa00t2c6.pdf* | Nigeria | 2018 | Food for Peace: food assistance in emergency response: In urban/peri-urban centres World Food Program provided cash transfers via mobile phones; e-voucher card for high-nutrient foods, cash and non-food items | Households in conflict affected north east Nigeria | Review of secondary data | Food Consumption Score (food security) | In Nigeria, IDP beneficiaries in one voucher program improved from zero households with acceptable Food Consumption Score (FCS) at baseline to 57% with acceptable FCS eight months later. | Gender blind intervention and analysis | X |
| N IV + | *Nkonya, E., Bawa, D., Kato, E., Maurice, D., Murtala, N., Nuhu, H., Kwaghe, P., Bila, Y., & Sani, R. (2019). Humanitarian assistance and resilience-building: Impact of Fadama III-AF II on food security and livelihood restoration in Northeastern Nigeria. IFPRI Project Note. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133172* | Nigeria | 2019 | Humanitarian assistance plus resilience-building Food-for-work and cash-for-work programs Nutrition advisory services targeted to women through community radio, media vans, and extension services. | Conflict-affected communities in north-eastern Nigeria: internally displaced persons, returnees, or people affected by the conflict who had not migrated | Not well specified (assumed difference-in-difference: treatment and control communities and the panel household data) | Household hunger score; Household diet diversity score | The household hunger score for the Fadama III–AF II beneficiaries was 39% lower than that of the control group, suggesting that food deprivation was significantly reduced among beneficiaries. The household dietary diversity score among project beneficiaries was 22% higher than that of the control group. | Gender blind intervention and analysis | X |
| V III + | *Cuong, N. V. (2013). The Impact of Social Security on Household Welfare: Evidence from a Transition Country. European Journal of Development Research, 25(5), 737–757. https://doi.org/10.1057/ejdr.2013.11* | Vietnam | 2013 | Social protection: social security transfers including contributory pensions and social allowances mostly in cash (sometimes in kind) | Retired people; poor | Fixed effects regression assuming that unobserved variables that are correlated with the receipt of pensions and social allowances are time invariant | Consumption expenditure on food and non-food items; on rice and non-rice food consumption | The receipt of social allowances reduced rice consumption and increased the non-rice food consumption. The receipt of pensions did not have an effect on rice and non-rice food consumption. Pension increased non-food, health and education expenditures. | Gender blind intervention and analysis | X |
| | **Consumer Behaviour - Institutions** | | | | | | | | | X |
| | **I. Institutional changes - Women's empowerment** | | | | | | | | | X |
| E IV + | *Yimer, F., & Tadesse, F. (2015). Women's empowerment in agriculture and dietary diversity in Ethiopia. ESSP II Working Paper 80. Washington, D.C. and Addis Ababa, Ethiopia: International Food Policy Research Institute (IFPRI) and Ethiopian Development Research Institute (EDRI). http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/129781* | Ethiopia | 2015 | Women's empowerment | *Not an intervention - Rural Ethiopian households in Tigray, Am-Hara, Oromiya, Southern Nations Nationalities and Peoples Region (SNNP),and Somali* | Instrumental variable approach: leave-out means of social norms, group membership, autonomy production, decision over credit and production diversity instrumented | Dietary diversity for children (<72 months) (7 food groups), diet diversity for women (9 food groups) | In IV models, the aggregate 5DE women's empowerment in agriculture score has a positive effect on children's diet diversity. Children's diet diversity is positively affected by empowerment in the domain of group membership, decision-making over credit and autonomy in agricultural production. In addition to the instrumented aggregate empowerment score, group membership, decision on credit, and autonomy on production decisions all have a positive significant effect on the number of food groups that women consume. There is positive association between more balanced workload and children's and women's diet diversity. | Instrumental focus on women or women's empowerment ; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| O V +/- | ***Santoso, M. V., Kerr, R. B., Hoddinott, J., Garigipati, P., Olmos, S., & Young, S. L. (2019). Role of Women's Empowerment in Child Nutrition Outcomes: A Systematic Review. Advances in Nutrition, 10(6), 1138–1151. https://doi.org/10.1093/advances/nmz056*** | Multiple | 2019 | Women's empowerment | *Not an intervention* | Systematic review of 62 studies of association between women's empowerment and indicators of children's nutrition (of 3 repeated cross section) | Children's nutritional status: stunted, wasted, or underweight; children's diet and children's illness | Women's empowerment (we) and stunting: 461 associations in 39 studies, of which 70 associations are positively statistically significant, 12 negatively, others insignificant. Similar proportions regardless of domains i.e. Accessing resources, material resource allocation and aggregate indices. Overall small effect sizes.<br>We and wasting: 258 associations in 22 studies: 34 positively statistically significant, 7 negatively, mostly in the domain of material allocation and aggregate indices. Generally small effect sizes.<br>We and infant and young child feeding (diets as proxy for nutrition): breastfeeding outcomes: 46 associations in 7 studies, 5 positively significant (but small: gain of less than half a day of breastfeeding) and 5 negatively (mostly in the domain of accessing resources).<br>Complementary feeding outcomes: 163 associations in 10 studies: 25 positively significant, and 8 negatively (mostly multiple domains or aggregate indices). | Instrumental focus on women or women's empowerment ; Gender blind analysis | X |
| B & E V + | ***Headey, D., Hoddinott, J., & Park, S. (2017). Accounting for nutritional changes in six success stories: A regression-decomposition approach. Global Food Security, 13(February), 12–20. https://doi.org/10.1016/j.gfs.2017.02.003*** | Ethiopia / Bangladesh | 2017 | Underlying determinants of undernutrition | *Not an intervention. Children under 5* | Use multiple rounds of demographic and health surveys (DHS) data to capture long term nutritional change and trends in explanatory variables over time. Estimate marginal effects of explanatory variables on nutrition outcomes and estimate plausible changes in Nutrition due to the changes in means observed explanatory variables using decomposition techniques. | Changes in child's nutrition status (stunting) (height-for-age (haz) z-scores for preschool children aged 0–59 months) | For Bangladesh, significant correlates of reduced stunting, which explain 57% of change in stunting, include household assets, improvements in parental education (significantly greater effect of maternal education), a reduction in open defecation, prenatal and birth delivery care, family reproductive factors (birth order and birth intervals), and maternal height. For Ethiopia, significant correlates of reduced stunting, which explain 22% of change in stunting, include household assets, father's and mother's education, mother's height, a reduction in open defecation, prenatal and birth delivery care but not the number of children ever born. Overall, asset accumulation and parental education, in Bangladesh particularly of mothers, are important predictors of nutritional improvement. Improvements in maternal height and reductions in fertility rates explain modest improvements in height-for-age z-score, and improvement antenatal and neonatal care are also important. | Instrumental focus on women or women's empowerment ; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B IV + | *Quisumbing, A. R., Sproule, K., Martinez, E. M., & Malapit, H. J. (2020). Women's empowerment in agriculture and nutritional outcomes: Evidence from six countries in Africa and Asia. IFPRI Discussion Paper 1930. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133732* | Bangladesh | 2020 | Women's empowerment | *Not an intervention. Women (15-49 years) and children up to 23 months* | Correlation women empowerment and nutritional outcomes in rural households (in 6 countries exploiting consistent measurement of the Women's Empowerment in Agriculture Index (WEAI) and nutritional outcomes across countries) | Household diet diversity, women's diet diversity, women's body mass index, children's dietary diversity score (6-23 months), height-for-age z-score, weight-for-height z-score, weight-for-age z-score (children 0 – 23 months). | In Bangladesh, the Women's Empowerment in Agriculture Index (WEAI) is positively correlated with household diet diversity and women's diet diversity, and negatively correlated with women's body mass index. A larger empowerment gap between female and male household co-heads is associated with lower diet diversity (household and women) and lower height-for-age z-score of children < 2 years. Women's empowerment has differential effects for boys and girls in several child anthropometric outcomes. Women's empowerment has a negative association for girls' anthropometrics relative to boys. In Nepal, Cambodia, and Ghana women's empowerment is positively associated with children's nutritional outcomes but not significantly related to women's nutritional outcomes. In Cambodia and Ghana, a higher empowerment gap is associated with worse children's nutritional outcomes, in Tanzania with worse women's diet diversity. In Mozambique, women's empowerment is better for boy's than for girl's infant and young child feeding. In Cambodia, it is better for girl's than for boy's anthropometrics. In Ghana, girls consume more diverse diets when women are less empowered and the empowerment gap wider. | Instrumental focus on women or women's empowerment (including empowerment gap); Analysis of women's diet diversity and gender disaggregated analysis of child undernutrition | X |
| | **II. Information campaigns** | | | | | | | | | X |
| B IV 0 | *Kramer, B. (2017). Cooking contests for healthier recipes: Impacts on nutrition knowledge and behaviors in Bangladesh. IFPRI discussion papers 1661. Washington D.C.: International Food Policy Research Institute (IFPRI). http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/131357* | Bangladesh | 2017 | Nutrition education and the additional effect of subsequent cooking contests | Women 15-35 years | Difference-in-difference participants for nutrition education; endline comparison neighbourhoods for cooking contest | Nutrition knowledge; proportion of total households' intake from micronutrient-rich foods; households' adequacy of weekly and daily micronutrient intake | Participants in the nutrition training showed a difference of 12% of the average test score compared with non-participants, with improvement in knowledge of their non-trained household member. The cooking contests did not have robust effects on nutrition knowledge, the proportion of total households' intake from micronutrient-rich foods or households' adequacy of weekly and daily micronutrient intake. | Women targeted; Analysis of impact on women only | X |
| B IV + | *Davidson, K. A., Kropp, J. D., Mullally, C., & Rahman, M. W. (2021). Can Simple Nudges and Workshops Improve Diet Quality? Evidence from a Randomized Trial in Bangladesh. American Journal of Agricultural Economics, 103(1), 253–274. https://doi.org/10.1111/ajae.12099* | Bangladesh | 2021 | Plate printed with a diagram of proper meal portioning and nutrition guidelines, including messaging about dietary diversity, proper portioning, maternal nutrition, and hand sanitation With or without behavioural change communication | Adult men and women | Lab-in-the-field-experiment: cluster randomisation to one of three plate treatments: receiving the plate at the first buffet event, receiving the plate at the second buffet event, or never receiving the plate. + individual randomisation to pre-buffet behavioural change communication workshop or no workshop | Diversity of food consumed in the buffet Outcomes measured during in-home interviews: an individual dietary diversity score for the household member invited to participate in the study and the World Food Program food consumption score for the entire household. | The workshop and receiving the plate at the previous meal both increase the meal diversity score by about a quarter standard deviation. No effect of the plate is found in the lab during the same lunch event when the plate is received. The plate is effective at home, and the nudge effects of in-home exposure persist in the lab even when the plate is not being used. Receipt of the plate at the first lunch event followed by one month of subsequent in-home access to the plate improves food choice at the second event. Combining treatments (workshop and food plate) does not increase their effectiveness. | Gender aware intervention (gender component in workshop but not analysed); Gender disaggregated analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B V + | *SPRING. 2018). Trends in Homestead Food Production and Nutrition Outcomes in the Feed the Future Zone of Influence, Bangladesh: An Impact Assessment of SPRING Interventions from 2012 – 2016. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project. https://www.spring-nutrition.org/publications/reports/trends-homestead-food-production-and-nutrition-outcomes-feed-future-zone* | Bangladesh | 2018 | Nutrition-sensitive agriculture interventions, such as the USAID-funded Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING) project. Farmer nutrition school (FNS), a 9-month, 18-session training that teaches groups of women about homestead food production, while also promoting essential nutrition actions and essential hygiene actions | Primarily pregnant and lactating women and women with children under 2 years of age, focusing on the two poorest wealth quintiles in rural Bangladesh and households with children under 5 years of age | Difference-in-difference (SPRING vs other Feed the Future areas) | Women's Diet<br>Children's Diet<br>Nutritional Status of under 5 children (stunting, severe stunting, wasting) | Maternal dietary diversity Did not dramatically in either SPRING or other Feed the Future areas, increasing by 0.1 percentage point and decreasing by 0.1 percentage point respectively, but the DIFFERENCE-IN-DIFFERENCE was statistically significant. Children's dietary indicators improved significantly in SPRING areas, relative to other Feed the Future areas, for children 6–23 months of age. Dietary diversity, minimum feeding frequency, and minimum acceptable diet (MAD) all improved in SPRING supported areas, while they declined in the other Feed the Future areas. DIFFERENCE-IN-differences for dietary diversity and MAD were statistically significant. SPRING had significant impact on severe stunting: each percentage point increase in the children reached by SPRING was associated with a 10percentdecrease in severe stunting. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |
| B IV + | *Harris-Fry, H. A., Azad, K., Younes, L., Kuddus, A., Shaha, S., Nahar, T., Hossen, M., Costello, A., & Fottrell, E. (2016). Formative evaluation of a participatory women's group intervention to improve reproductive and women's health outcomes in rural Bangladesh: A controlled before and after study. Journal of Epidemiology and Community Health, 70(7), 663–670. https://doi.org/10.1136/jech-2015-205855* | Bangladesh | 2016 | Monthly women's group intervention using participatory learning and action PLA approach facilitated by locally recruited women: identify problems and implement strategies relating to women's health. | Woman of reproductive age (15–49 years) in rural Bangladesh | Difference-in-difference | Women's dietary diversity score<br>Knowledge about nutrition and anaemia prevention | Significant improvements in women's dietary diversity score (increase of 0.2 (95% CI 0.1 to 0.3)) and participation in healthcare decision-making (proportion increase (95% CI) 14.0% (10.6% to 17.4%)). There were also increases in knowledge about: contraception (4.2% (2.0% to 6.3%)), ways to treat (55.4% (52.2% to 58.5%)) and prevent (71.0% (68.0% to 74.1%)) sexually transmitted infections, nutrition (46.6% (43.6% to 49.6%)) and anaemia<br>Prevention (62.8% (60.9% to 64.6%)). | Women targeted; Analysis of impact on women only | X |
| E III + | *Yetnayet, M., Henry, C. J., Berhanu, G., Whiting, S. J., & Regassa, N. (2017). Nutrition education promoted consumption of pulse based foods among rural women of reproductive age in Sidama zone, Southern Ethiopia. African Journal of Food, Agriculture, Nutrition and Development, 17(3), 12377–12394. https://doi.org/10.18697/ajfand.79.16795* | Ethiopia | 2017 | Nutrition education focused on food-based strategies and consumption of pulse-based food products among women and their households, Recipe demonstrations and group discussions | Women of reproductive age (15 – 49 y) | Pre-test–post-test control group design (but no formal difference in difference analysis) | Mothers' perceptions of their own and their children's susceptibility to undernutrition<br>Knowledge, attitude, practice score (regarding pulse consumption)<br>Consumption pattern of pulses | Compared to control group, treated women showed a significant improvement in the mean knowledge ($p<0.001$), attitude ($p<0.001$), and practice scores ($p<0.001$). Significant ($p<.001$) improvement was seen in perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and taking health action. | Women targeted; Analysis of impact on women only | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| N I + | *Jatau, A. A. (2013). Effect of nutrition education programme on food-related-knowledge and attitudes of literate women in Pankshin community, Nigeria. Mediterranean Journal of Social Sciences, 4(15 SPEC.ISSUE), 35–41. https://doi.org/10.5901/mjss.2013.v4n15p35* | Nigeria | 2013 | Nutrition education programme on food-related- knowledge and attitudes of literate women | Literate women in Pankshin community, rural Nigeria | Comparison of pre-intervention and post-intervention nutrition knowledge and attitude test in control and treatment group (small sample of 181 women) | Nutrition knowledge and attitude test | There were statistical significant positive difference between the mean scores of the nutritional knowledge of women exposed to nutrition education programme (NEP) and those not exposed to NEP, and between the mean scores of the nutritional attitudes of the women exposed to NEP and those not exposed to NEP (post-intervention). | Women targeted; Analysis of impact on women only | X |
| V I + | *Daudt, L., Hoang, G., Pham, T. T., & Graham, S. (2018). Child Nutrition Education for Lifelong Healthy Eating Habits in Mai Dam Commune, Vietnam. Pediatrics, 142(1 MeetingAbstract), 506–506. https://pediatrics.aappublications.org/content/142/1_MeetingAbstract/506* | Vietnam | 2018 | Nutrition education program for primary school children | Primary school children and some of their parents | Before-after | Knowledge test: model the recommended amounts of food in proportion to each other | Knowledge test average increased from 59% to 63%, with the greatest improvements seen for the 1st (63% to 79%) and 5th (72% to 80%) grades. | Gender blind intervention and analysis | X |
| V II + | *Ha, D. A., & Chisholm, D. (2011). Cost-effectiveness analysis of interventions to prevent cardiovascular disease in Vietnam. Health Policy and Planning, 26(3), 210–222. https://doi.org/10.1093/heapol/czq045* | Vietnam | 2011 | Mass media to reduce salt intake | General population | Comparison with simulated expected ischemic heart disease (IHD) and stroke | Averted Disability Adjusted Life Years (DALYs)/year | Mass media salt campaign was estimated to have resulted in 45939 Disability Adjusted Life Years (DALYs)averted per year, based on simulations of expected rates of disease incidence of ischemic heart disease (IHD) and stroke that would occur in the Vietnamese population with and without the implementation of the prevention measures and calculated lifetime health gains as a result of the intervention-induced changes in disease incidence. | Gender blind intervention and analysis | X |
| V V + | *Do, H. T. P., Santos, J. A., Trieu, K., Petersen, K., Le, M. B., Lai, D. T., Bauman, A., & Webster, J. (2016). Effectiveness of a Communication for Behavioral Impact (COMBI) Intervention to Reduce Salt Intake in a Vietnamese Province Based on Estimations From Spot Urine Samples. Journal of Clinical Hypertension, 18(11), 1135–1142. https://doi.org/10.1111/jch.12884* | Vietnam | 2016 | Communication for Behavioural Impact (COMBI) (mass media communication, promotion of healthy eating behaviour in primary schools, information campaigns at community level and targeted info and follow up of high-risk and hypertension groups) | General population, primary school children, at risk groups | Before-after (different sample base and endline) | Knowledge and behaviour of salt consumption, physical measurements such as blood pressure, waist circumference, body mass index and spot urine samples | Salt excretion declined from 9.43 (3.69) g/d to 7.44 (4.09) g/d (insignificant); knowledge about adverse health effects of salt intake improved. At endline, 43.84% of respondents reportedly limited adding salt or sauces when cooking, versus 5.91% at baseline; 61.64% limited adding salt or sauces at the table at endline, versus 13.19% at baseline; at endline 35.81% limited the consumption of processed foods, 31.31% the consumption of dishes high in salt versus respectively 3.54% and 2.95% at baseline. Average systolic and diastolic blood pressure were significantly lower at endline versus baseline, respectively a 5.93 mm hg and 4.86 mm hg reduction and the proportion of respondents with hypertension dropped from 26.13% to 21.14%. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| V III + | *Nguyen, T., de Brauw, A., van den Berg, M., & Phuong Ha, D. T. (2020). Testing methods to increase consumption of healthy foods: Evidence from a school-based field experiment in Viet Nam. IFPRI Discussion Paper 1939. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133777* | /Vietnam | 2020 | Nutrition education and access to healthy foods, fruits more in particular | Children in primary schools in a relative poor district in peri-urban Hanoi | Cluster-randomized trial at the level of schools; for the nutrition education treatment: per school some grades were assigned to treatment and other grades to control; one out of 6 pairs of schools was selected for the fruit snack treatment | Nutrition knowledge index score at short term and after 6 months; children's daily fruit consumption; nutrition knowledge among parents | At the end of the 5 weeks, on average, the children who were offered the nutrition lessons gained 0.33 standard deviations in the nutrition knowledge index score. There were no significant changes in knowledge and attitude among parents. There was no additional effect on knowledge when the nutrition lessons were combined with the fruit intervention. Neither the nutrition lessons nor fruit provision led to a significant change in children's attitudes about FAV consumption. Education lessons Did not influence the FAV consumption by children. Access to free fruit increased children's fruit consumption but by half the portion than was provided, doubling the daily fruit consumption vis-a-vis the control group. After 6 months, the nutrition lessons Did not have an effect anymore on children's nutrition knowledge and attitude. | Gender blind intervention and analysis | X |
| O V / | *Ayisi Addo, S., & Steiner-Asiedu, M. (2019). Telephone based weight loss intervention: Relevance for developing countries. Critical Reviews in Food Science and Nutrition, 59(13), 2095–2101. https://doi.org/10.1080/10408398.2018.1437536* | Multiple | 2019 | Telephone based weight loss intervention for overweight/obese individuals with obesity related diseases | Overweight/obese Individuals with obesity related diseases | Reviews efficacy studies of telephone based weight loss interventions and discusses potential of telephone based weight loss interventions for developing countries with increasing obesity rates | % weight loss (efficacy studies of telephone based weight loss interventions) Opportunities and challenges for telephone based weight loss interventions in developing countries | Telephone based weight loss interventions for overweight/obese individuals with obesity related diseases show they are effective for weight loss and reduction of hypertension and glycosylated haemoglobin, relatively cheap compared to face-to-face interventions. Follow up through continued regular telephone contact is helpful to sustain effects.<br>Because of the high subscriptions of mobile phones in developing countries, mobile phone based weight loss intervention have the potential to deliver services at large scale and in a relatively cheap way. They can overcome health service delivery and utilisation barriers. | Gender blind intervention and analysis | X |
| | **III. Child nutrition** | | | | | | | | | X |
| | ***a) Child nutrition: Information campaigns*** | | | | | | | | | X |
| E V + | *White, J., & Mason, J. (2012). Assessing the impact on child nutrition of the Ethiopia Community-based Nutrition Program. New Orleans: Tulane University School of Public Health and Tropical Medicine. https://www.exemplars.health/-/media/files/egh/resources/stunting/ethiopia/assessing-the-impact-on-child-nutrition-of-the-ethiopia-communitybased-nutrition-program.pdf* | Ethiopia | 2012 | Community-based Nutrition (CBN) Program linked to Health Extension via Community Health Workers: weighing children under two + counselling mothers + community meetings care and hygiene practices+ follow up malnourished and sick children | Children under two; mothers | Change between baseline and midline (different sample); anthropometrics (compare with DHS trend) | Minimum diet diversity (4 food groups); minimum meal frequency; anthropometrics (compared with DHS trend) | Community-based Nutrition (CBN) Program significantly increased the percentage of children between 6 and 23 months reaching minimum diet diversity (four food groups or more) by 15 to 20 percentage points, raising the percentage of children meeting minimum dietary diversity at midline to around 50%. Minimum meal frequency significantly increased with 8 percentage points to 66%.<br>Rates of stunting in children under the age of three decrease as a result of CBN are between 4.3 pp/year and 5.3 pp/year, whereas trends estimated based on the DHS are at around 1.3 pp reduction in stunting per year between 2000 and 2011. Changes in prevalence of underweight children between baseline and midline as a result of CBN were not significant, DHS based estimates pointed to a decrease between 0.7 and 1.9 pp/year in underweight between 2000 and 2011. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| E V + | ***Moss, C., Bekele, T. H., Salasibew, M. M., Sturgess, J., Ayana, G., Kuche, D., Eshetu, S., Abera, A., Allen, E., & Dangour, A. D. (2018). Sustainable Undernutrition Reduction in Ethiopia (SURE) evaluation study: A protocol to evaluate impact, process and context of a large-scale integrated health and agriculture programme to improve complementary feeding in Ethiopia. BMJ Open, 8(7), 1–11. https://doi.org/10.1136/bmjopen-2018-022028***<br>***T., Gonete, K. A., Muhammad, E. A., & Atnafu, A. (2020). Sustainable under nutrition reduction program and dietary diversity among children's aged 6-23 months, Northwest Ethiopia: Comparative cross-sectional study. International Journal for Equity in Health, 19(1), 1–11. https://doi.org/10.1186/s12939-019-1120-1***<br><br>***Kuche, D. (2019). Sustainable Undernutrition Reduction in Ethiopia (SURE): Evaluation studies. Presented at the National Nutrition Conference in Ethiopia. https://www.slideshare.net/essp2/sustainable-undernutrition-reduction-in-ethiopia-sure-evaluation-studies*** | Ethiopia | 2019 | Integrated health and agriculture programme to improve complementary feeding | Mother-father pairs; infants and young children | Quasi-experimental theory-based evaluation (mixed methods + difference-in-difference)<br>Worku et al. (2020): with-without study | Intended: Stunting and wasting of children 24-47 months, anaemia of children 6-47 months, minimum acceptable diet (mad) of children 6-23 months, women's minimum dietary diversity (w-mdd)<br>Worku et al. (2020): Children's diet diversity (at least four out of seven food groups) | Preliminary results in Worku et al. 2020 shows that 33.4% of children had adequate diet diversity in areas covered by sure, significantly higher than 26.6% in areas not covered by sure. | Gender accommodating intervention (addresses gender-based roles relevant for child feeding practices); Analysis of impact for women's diet diversity and gender blind analysis of child nutrition outcomes | X |
| E V + | ***Fenn, B., Bulti, A. T., Nduna, T., Duffield, A., & Watson, F. (2012). An evaluation of an operations research project to reduce childhood stunting in a food-insecure area in Ethiopia. Public Health Nutrition, 15(9), 1746–1754. https://doi.org/10.1017/S1368980012001115*** | Ethiopia | 2012 | Wash, nutrition education, health, combined interventions | Pregnant mothers and carers of children below 2 years; children 6 to 36 months | Difference-in-difference | Height-for-age z-score (haz) children aged 6 to 36 months; knowledge about causes and treatment of diarrhoea; mothers' knowledge about complementary feeding of children and breastfeeding; mean dietary diversity (adjusted to age of children) | Wash intervention had a positive effect of 0.33 of on the height-for-age z-score of children aged 6 to 36 months; other interventions had no effects on height-for-age z-score.<br>Each of the interventions had a positive significant effect on knowledge about causes and treatment of diarrhoea (negative of wash on treatment of diarrhoea) and mothers' knowledge about complementary feeding of children and breastfeeding and treatment of diarrhoea.<br>Nutrition and integrated intervention had a positive significant effect on knowledge about complementary feeding of children and breastfeeding.<br>Wash intervention had negative effect on knowledge about complementary feeding of children and breastfeeding and mean dietary diversity of children. | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| E V + | *Kang, Y., Suh, Y. K., Debele, L., Juon, H. S., & Christian, P. (2017a). Effects of a community-based nutrition promotion programme on child feeding and hygiene practices among caregivers in rural Eastern Ethiopia. Public Health Nutrition, 20(8), 1461–1472. https://doi.org/10.1017/S1368980016003347*<br>*Kang, Y., Kim, S., Sinamo, S., & Christian, P. (2017b). Effectiveness of a community-based nutrition programme to improve child growth in rural Ethiopia: a cluster randomized trial. Maternal and Child Nutrition, 13(1), 1–15. https://doi.org/10.1111/mcn.12349* | Ethiopia | 2017 | Community-based nutrition promotion | Underweight children between 6 to 24 months and their mothers | Randomised control trial (paired geographical clusters) | Kang et al. (2017a): score used for measuring meal frequency for children between 6 and 24 months (adjusted to age of children); a first composite feeding score based on scores of breast-feeding, dietary diversity and meal frequency; a second composite feeding score based on scores of dietary diversity and meal frequency<br>Kang et al. (2017b): height-for-age (haz), weight-for-height (whz) prevalence of stunting, underweight. | Kang et al. (2017a): score used for measuring meal frequency for children between 6 and 24 months was significantly higher in the treatment areas, as was first composite feeding score and second composite feeding score. No effect was detected on scores measuring diet diversity and breastfeeding practices for children between 6 and 24 months and the hand washing score.<br>Kang et al. (2017b): compared with control children 6 to 24 months of age, treated children had a greater increase in height-for-age z-score [difference (diff): 0.021 z score/month, 95% ci: 0.008, 0.034] and weight-for-height z-score (diff: 0.042 z score/month, 95%ci: 0.024, 0.059). At the end of the 12-month follow-up, treated children showed an 8.1% (p= 0.02) and 6.3% (p= 0.046) lower prevalence of stunting and underweight, respectively, after controlling for differences in the prevalence at enrolment, compared with the control group. | Kang et al. (2017a) Mothers targeted; Gender blind analysis<br>Kang et al. (2017b) Mothers targeted; Gender aware analysis (controlled for sex of child) | X |
| E IV + | *Tariku, B., Whiting, S. J., Mulualem, D., & Singh, P. (2015). Application of the Health Belief Model to Teach Complementary Feeding Messages in Ethiopia. Ecology of Food and Nutrition, 54(5), 572–582. https://doi.org/10.1080/03670244.2015.1049344* | Ethiopia | 2015 | Health belief model for complementary feeding messages | Children 6–18 months and their mothers | Cluster-randomized trial: 21 matched trios of communities (kebeles); one of the matched communities per trio assigned to receive the health belief model intervention, one the traditional education and one to control group. | Breastfeeding duration, frequency of breastfeeding, meal frequency, children's diet diversity | There was no effect of the health belief model (HBM) nor traditional education on breastfeeding duration, frequency of breastfeeding and handwashing practices.<br>Meal frequency of infants and young children was higher in the HBM communities than communities with traditional education and control communities. In HBM communities, there was also a larger proportion of children who achieved minimum diet diversity (min four food groups) than in the control community; the traditional education had no effect. | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| E V + | *Kim, S. S., Rawat, R., Mwangi, E. M., Tesfaye, R., Abebe, Y., Baker, J., Frongillo, E. A., Ruel, M. T., & Menon, P. (2016). Exposure to large-scale social and behavior change communication interventions is associated with improvements in infant and young child feeding practices in Ethiopia. PLoS ONE, 11(10), 1–18. https://doi.org/10.1371/journal.pone.0164800* | Ethiopia | 2016 | Social and behaviour change communication infant and young child feeding (IYCF) | Children up to 60 months; their mothers and general population | Before and after comparisons based on repeated cross-sectional data (adequacy design) | Child height-for-age z-scores (haz), weight-for-age z-scores (waz), and weight-for-height z-scores (whz) and prevalence of underweight and wasting<br>Early initiated and exclusive breastfeeding, complementary feeding, minimum meal frequency, minimum diet diversity, minimum acceptable diet and likelihood of having consumed iron-rich food | height-for-age z-scores (haz), weight-for-age z-scores (waz), and weight-for-height z-scores (whz) and prevalence of underweight and wasting were not different at endline as compared to baseline.<br>At endline compared to baseline: increased early initiated and exclusive breastfeeding, improved complementary feeding, increased attainment of minimum meal frequency, minimum diet diversity, minimum acceptable diet and likelihood of having consumed iron-rich food. There was a positive dose-response association for a number of outcomes. | Mothers and general population targeted; Gender blind analysis | X |
| E V + | *Kim, S. S., Nguyen, P. H., Yohannes, Y., Abebe, Y., Tharaney, M., Drummond, E., Frongillo, E. A., Ruel, M. T., & Menon, P. (2019). Behavior change interventions delivered through interpersonal communication, agricultural activities, community mobilization, and mass media increase complementary feeding practices and reduce child stunting in Ethiopia. Journal of Nutrition, 149(8), 1470–1481. https://doi.org/10.1093/jn/nxz087* | Ethiopia | 2019 | Alive & Thrive (A&T) provided intensive behaviour change interventions through 4 platforms: interpersonal communication (IPC), nutrition-sensitive agricultural activities (AG), community mobilization (CM), and mass media (MM).<br>Intensive=nutrition-sensitive agricultural activities+ interpersonal communication, community mobilisation, mass media<br>Non-intensive=nutrition-sensitive agricultural activities+ interpersonal communication, mass media | Mothers of children aged 6–23.9mo | Clustered randomised control trial (intensive and non-intensive randomised over districts)<br>Intensive intervention package compared to a non-intensive program.: difference-in-difference impact estimates and conducted dose–response and path analyses | Children's minimum dietary diversity, minimum acceptable diet, minimum meal frequency<br>Complementary feeding practices in children aged 6–23.9 months, maternal complementary feeding knowledge and<br>Prevalence of stunting among children aged 6–23.9 months | Minimum dietary diversity (MDD) and minimum acceptable diet increased significantly in the intensive group but remained low at endline (24.9% and 18.2%, respectively). Significant differential declines in stunting prevalence were observed (difference-in-difference impact estimates: −5.6 percentage points; $p < 0.05$) in children aged 6–23.9 months, decreasing from 36.3% to 22.8% in the intensive group. Dose–response analyses showed higher odds of MDD (or: 3.3; 95% ci: 2.2, 4.8) and minimum meal frequency (or: 1.9; 95% ci: 1.4, 2.6) and higher child height-for-age z-scores (β: 0.24; 95% ci: 0.04, 0.4) among women exposed to 3 or 4 platforms. There was a strong relation between nutrition-sensitive agricultural activities and egg consumption, leading to increased child dietary diversity and height-for-age z-scores. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B V 0 | ***Moazzem Hossain, S. M., Duffield, A., & Taylor, A. (2005). An evaluation of the impact of a US$60 million nutrition programme in Bangladesh. Health Policy and Planning, 20(1), 35–40. https://doi.org/10.1093/heapol/czi004***<br><br>***Responses by:***<br><br>***Levinson, F. J., Rohde, J. E., Sack, D. A., Roy, S. K., Ahmed, T., & Fuchs, G. (2005). Responses to: "An evaluation of the impact of a US$60 million nutrition programme in Bangladesh." Health Policy and Planning, 20(6), 405–407. https://doi.org/10.1093/heapol/czi049***<br><br>***Sack, D. A., Roy, S., Ahmed, T., & Fuchs, G. (2005). Responses to: 'An evaluation of the impact of a US$60 million nutrition programme in Bangladesh.' Health Policy and Planning, 20(6), 406–407. https://doi.org/10.1093/heapol/czi060***<br><br>***White, H., & Masset, E. (2007). Assessing interventions to improve child nutrition: a theory-based impact evaluation of the Bangladesh Integrated Nutrition Project. Journal of International Development, 19(5), 627–652. https://doi.org/10.1002/jid.1344*** | Bangladesh | 2005 | National nutrition programme | Children 6-23 months and children 6-59 months and their carers | With/without comparison (ex-post single difference evaluation) | Prevalence of severe nor moderate underweight, stunting (low height-for-age) nor wasting (low weight-for-height) in children aged 6–23 months and 6-59 months; carers' knowledge of prenatal care and nutrition and infant and young children feeding practices; iron tablets during pregnancy and antenatal check-ups | There were no differences between project area and non-project area in the prevalence of severe nor moderate underweight, stunting nor wasting in children aged 6–23 months; and in the prevalence of severe and moderate underweight, stunting and wasting in children aged 6–59 months.<br>Compared with those in non-project areas, project-area-carers were more likely to take iron tablets during pregnancy and attend at least 3 antenatal check-ups. Their knowledge and practices of prenatal care and nutrition and infant and young children feeding practices were better.<br>There were limited effects on better nutrition outcomes for children partly through ineffective targeting and limited practice change on the part of mothers (White and Masset 2007). | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B IV + | *Shi, L., & Zhang, J. (2011). Recent evidence of the effectiveness of educational interventions for improving complementary feeding practices in developing countries. Journal of Tropical Pediatrics, 57(2), 91–98. https://doi.org/10.1093/tropej/fmq053* | Bangladesh | 2011 | Nutrition education or counselling about complementary feeding practices: Aboud et al. (2008) weekly education sessions for the children's carers on child nutrition, child self-feeding and parent's responsive feeding | Aboud et al. (2008): Children aged 12–24 months | Review of epidemiological Studies (cross-sectional and cohort studies, randomised control trials) that used nutrition education or counselling as intervention strategy aimed at improving complementary feeding practices. (Zooming in on Aboud et al. (2008)Bangladesh, difference-in-difference analysis) | Aboud et al. (2008): Children's weight, child self-feeding behaviour, diet variety, and mother's knowledge | Generally, the review concluded that educational interventions can effectively improve complementary feeding practices and child nutrition and growth. Such interventions should be culturally sensitive, accessible and integrated with local resources. The study by Aboud et al. (2008) for Bangladesh showed that children in the intervention group with weekly education sessions for the children's carers on child nutrition, child self-feeding and parent's responsive feeding gained 0.34 kg more weight than in the control group. At endline, child self-feeding behaviour, diet variety and mother's knowledge were better in the intervention than in the control group. | Mothers targeted; Gender blind analysis | X |
| B III + | *Warren, A. M., Frongillo, E. A., Nguyen, P. H., & Menon, P. (2020). Nutrition intervention using behavioral change communication without additional material inputs increased expenditures on key food groups in bangladesh. Journal of Nutrition, 150(5), 1284–1290. https://doi.org/10.1093/jn/nxz339* | Bangladesh | 2020 | Behavioural Change Communication including interpersonal counselling, community mobilization, and mass Media campaigns to promote breastfeeding and complementary feeding versus non-intensive infant and young children feeding services through home visits and interpersonal counselling | (Mothers of) children under 2 years of age | Non-blinded clustered randomised trial with two treatment arms: a) Intensive interpersonal counselling (IPC), Community mobilization (CM), and mass media (MM) (Alive & Thrive), b) standard nutrition counselling with less intensive CM and MM Difference-in-difference analysis | Food and non-food expenditures Children's and women's dietary diversity Women's economic resources | Expenditures on eggs and flesh foods increased more, by 0.65 and 5.5 US $/month respectively, in areas with intensive interpersonal counselling combined with intensive community mobilisation and mass media than in areas with non-intensive nutrition counselling, community mobilisation and mass media. Household food expenditures increased more in intensive areas by 9.8 US $/month, whereas changes in non-food expenditures Did not differ. Women's employment and control of income increased more in intensive areas, by 12 and 13 percentage points respectively, while jewellery ownership decreased more by 23 percentage points. The intensive treatment increased women's diet diversity with 4.44 food groups. Higher expenditures on food groups were reflected in higher consumption of eggs and flesh foods by women and children. This shows recipients in the intensive intervention mobilized additional resources to improve diets, reflected in increased expenditures and consumption of promoted foods. | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B V 0 | *Menon, P., Nguyen, P. H., Saha, K. K., Khaled, A., Sanghvi, T., Baker, J., Afsana, K., Haque, R., Frongillo, E. A., Ruel, M. T., & Rawat, R. (2016). Combining intensive counseling by frontline workers with a nationwide mass media campaign has large differential impacts on complementary feeding practices but not on child growth: Results of a cluster-randomized program evaluation in Bangladesh1-3. Journal of Nutrition, 146(10), 2075–2084. https://doi.org/10.3945/JN.116.232314* | Bangladesh | 2016 | Behavioural Change Communication including interpersonal counselling, community mobilization, and mass Media campaigns to promote breastfeeding and complementary feeding versus non-intensive infant and young children feeding services through home visits and interpersonal counselling | (Mothers of) children under 2 years of age | Non-blinded clustered randomised trial with two treatment arms: a) Intensive interpersonal counselling (IPC), Community mobilization (CM), and mass media (MM) (Alive & Thrive), b) standard nutrition counselling with less intensive CM and MM Difference-in-difference analysis | Complementary feeding practices in children aged 6–24 months: a) Minimum dietary diversity; b) minimum meal frequency as appropriate for age and breastfeeding status; c) minimum acceptable diet ; d) consumption of iron-rich or iron-fortified food; and e) timely introduction of solid, semisolid or soft foods Anthropometrics: Height-for-age, weight-for-age, weight-for-height z-scores, prevalence of stunting in children aged 24–48 months | Four years after the start of the intervention, the difference-in-difference impact estimates of the treatment with intensive interpersonal counselling combined with intensive community mobilisation and mass media versus non-intensive nutrition counselling, community mobilisation and mass media were 16.3 percentage points (pp) for minimum dietary diversity, 14.7 p for minimum meal frequency, 22.0 pp for minimum acceptable diet, and 24.6 pp for consumption of iron-rich foods. Stunting in children aged 24-48 months declined by 6.3 pp in the intensive group and by 5.2 pp in the non-intensive group. The reductions are not significantly different. Similar patterns were observed among children aged 6-24 months. Improvements in mean height-for-age, weight-for-age, weight-for-height z-scores Did not differ between groups in either age group of children. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |
| B IV + | *Kim, S. S., Nguyen, P. H., Tran, L. M., Sanghvi, T., Mahmud, Z., Haque, M. R., Afsana, K., Frongillo, E. A., Ruel, M. T., & Menon, P. (2018). Large-Scale Social and Behavior Change Communication Interventions Have Sustained Impacts on Infant and Young Child Feeding Knowledge and Practices: Results of a 2-Year Follow-Up Study in Bangladesh. Journal of Nutrition, 148(10), 1605–1614. https://doi.org/10.1093/jn/nxy147* | Bangladesh | 2018 | Behavioural Change Communication including interpersonal counselling, community mobilization, and mass Media campaigns to promote breastfeeding and complementary feeding versus non-intensive infant and young children feeding services through home visits and interpersonal counselling | (Mothers of) children under 2 years of age | Non-blinded clustered randomised trial with two treatment arms: a) Intensive interpersonal counselling (IPC), Community mobilization (CM), and mass media (MM) (Alive & Thrive), b) standard nutrition counselling with less intensive CM and MM Difference-in-difference analysis | Complementary feeding practices in children aged 6–24 months: a) Minimum dietary diversity; b) minimum meal frequency as appropriate for age and breastfeeding status; c) minimum acceptable diet ; d) consumption of iron-rich or iron-fortified food; and e) timely introduction of solid, semisolid or soft foods Mother's knowledge of complementary feeding practices | In intensive areas, exposure to intensive interpersonal counselling decreased slightly between endline 4 years after start of intervention and follow-up 2 years after endline, exposure to community mobilisation activities decreased significantly and mass media exposure was unchanged. Mothers' complementary feeding knowledge score remained the same between endline and follow-up in intensive areas and increased in non-intensive areas. In areas with intensive treatment, timely introduction of solid, semisolid or soft foods, minimum dietary diversity, and consumption of iron-rich foods decreased significantly between endline and follow-up but remained higher than at baseline. In non-intensive areas, timely introduction of solid, semisolid or soft foods decreased, whereas minimum dietary diversity and consumption of iron-rich foods remained unchanged. Minimum meal frequency increased in both intensive and non-intensive areas. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B V + | *Ara, G., Khanam, M., Papri, N., Nahar, B., Kabir, I., Sanin, K. I., Khan, S. S., Sarker, M. S. A., & Dibley, M. J. (2019). Peer Counseling Promotes Appropriate Infant Feeding Practices and Improves Infant Growth and Development in an Urban Slum in Bangladesh: A Community-Based Cluster Randomized Controlled Trial. Current Developments in Nutrition, 3(7), 1–10. https://doi.org/10.1093/cdn/nzz072* | Bangladesh | 2019 | Peer counselling combined with psychosocial stimulation targeting mother-infant pairs | Children aged 0-12 months in urban slums in Bangladesh | Clustered (community) randomised control trial with two treatment arms: a)Peer counselling to mother–infant pairs on feeding practices plus psychosocial stimulation, b)usual health messages | Infant and young child (breastfeeding and) complementary feeding practices: 1) Minimum dietary diversity; b) minimum meal frequency as appropriate for age and breastfeeding status; c) minimum acceptable diet ; d) consumption of eggs, flesh foods, animal sourced protein Anthropometrics: height-for-age z score from birth until 12 months of age by sex of child, prevalence of stunting | Mothers in the intervention group, who received peer counselling combined with psychosocial stimulation, were more likely to report recommended feeding practices compared with the control group when their infants were ages 1, 3, 5, 7, 9, and 12 months of age. Children aged 7–12 months in the intervention group had higher likelihood of achieving minimum dietary diversity and consuming fleshly foods as compared with the control group. Frequency of egg and protein consumption (egg, flesh food, and organs) was significantly higher among infants in the intervention group than in the control group. The peer counselling intervention was positively associated with change in the height of the infants (adjusted for age and sex). Girls' height increased less than that of boys. | Mothers targeted; Gender disaggregated analysis | X |
| B V + | *Roy, Swapan Kumar, Jolly, S. P., Shafique, S., Fuchs, G. J., Mahmud, Z., Chakraborty, B., & Roy, S. (2007). Prevention of malnutrition among young children in rural Bangladesh by a food-health-care educational intervention: A randomized, controlled trial. Food and Nutrition Bulletin, 28(4), 375–383. https://doi.org/10.1177/15648265070 2800401* | Bangladesh | 2007 | Weekly nutrition education based on the nutrition triangle concept of UNICEF supported with behavioural change communication materials, demonstration of preparation of energy-, protein-, and micronutrient rich local complementary foods, counselling with mothers, and community mobilisation involving men and older household members | (Mothers of) normal and mildly malnourished children aged 6-9 months in rural Bangladesh | Randomised control trial with two treatment arms a) weekly nutrition education, and b) regular Bangladesh Integrated Nutrition Project services, randomised by Community Nutrition Centres Difference-in-difference analysis | Qualitatively: Mothers' perceptions of child feeding, food taboos, caring practices, immunisation, and health care-seeking behaviour Quantitatively: Infant feeding practices, changes in weight and height Cost-effectiveness | A significant increase in the frequency of complementary feeding was observed in the intervention group that received weekly nutrition education for 6 months as compared with the control group that received regular Bangladesh Integrated Nutrition Project services, and the increase was sustained over a 6-month period after intervention. Both mean weight-for-age z-score and the mean height-for-age z-score of children in the intervention group increased significantly compared with those of the control group immediately after and 6 months after intervention. Changes in weight-for-height z-scores and mean mid-upper-arm circumference were not significantly different. The proportion of normal and mildly malnourished children was greater and proportion of severely malnourished children lower in the intervention group than in the control group at the end of the intervention. Findings from the cost-effectiveness study showed that the total cost of preventing malnutrition in one child ranged between US$ 19 and 37 depending on the intervention area. | Mothers targeted (men involved); Gender blind analysis | X |
| B V 0 | *Aboud, F. E., Singla, D. R., Nahil, M. I., & Borisova, I. (2013). Effectiveness of a parenting program in Bangladesh to address early childhood health, growth and development. Social Science and Medicine, 97, 250–258. https://doi.org/10.1016/j.socscimed.20 13.06.020* | Bangladesh | 2013 | Group meetings, home visits and behaviour change communication about parenting practices related to health, nutrition, communication and play targeted at mothers | Children aged 6-12 months and children aged 12-24 months in rural and peri-urban Bangladesh | Difference-in-difference analysis | Children's height-for-age Children's diet diversity | There were no differences in length-for-age in the treatment group who participated in a 10-month parenting program and the non-participating control group. Children in both groups became more stunted over time. Among the parenting practices expected to improve among intervention caregivers, children's dietary Diversity, HOME stimulation and knowledge about developmental milestones yielded significantly better scores for intervention caregivers compared to controls. Children's diet diversity was significantly improved for younger but not older intervention children. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B III + | *Jannat, K., Luby, S. P., Unicomb, L., Rahman, M., Winch, P. J., Hossain, M. I., & Stewart, C. P. (2020). Snack food consumption among Bangladeshi children, supplementary data from a large RCT. Maternal and Child Nutrition, 16(4), 1–11. https://doi.org/10.1111/mcn.12994* | Bangladesh | 2020 | Nutrition intervention messages included four promotional components: maternal Nutrition, breastfeeding, complementary feeding, and lipid-based nutrient supplements | (Mothers of) children under 3 years of age in rural Bangladesh | Clustered randomised control trial with seven treatment arms: a) single nutrition (N), b) water (W), c) sanitation (S), d)hygiene (H), e) combined water, sanitation, and hygiene (WSH), f) combined WSH and nutrition (N + WSH), and g) a double sized control (C). | Snack food and packaged food consumption patterns (last 7 days) among children under 3 years of age (follow-up at year 1 when children were less than 1 year of age and follow-up at year 2) | The likelihood of any snack food consumption was significantly lower (odds ratio 0.37: 95% confidence interval [0.28, 0.49]) in the nutrition intervention arms<br>Compared to the control arm in Year 2 follow-up. In addition, in the water intervention arm, fewer children (about 50% less) consumed soft drinks, but not the other sugar-sweetened beverages, compared with control in Year 2. There were no other differences between groups. Simple messages about balanced diet and feeding family foods were effective in lowering commercially produced snack food consumption of the young children in low-income rural communities of Bangladesh. Provision of safe water apparently encouraged mothers to reduce offering unhealthy beverages to the young children. | Mothers targeted; Gender blind analysis | X |
| N V + | *Lawal, B. O., & Jibowo, A. A. (2006). Impact of household food security and nutrition programme on the nutritional status of children in Oyo state, Nigeria. Nutrition and Food Science, 36(5), 327–336. https://doi.org/10.1108/00346650610703171* | Nigeria | 2006 | Household food security and nutrition programme including nutrition education and training on (staple crop) farming technologies targeted at women | Children aged 0-5 years | With-without comparison | Children's anthropometrics: height-for-age index, weight-for-height index | In communities participating in the household food security and nutrition program lower incidence of stunting, wasting and underweight in children was observed than in non-participating communities. Mean weight-for-age and height-for-age z-scores of children in participating communities is significantly higher than in in non-participating communities. | Mothers targeted; Gender blind analysis | X |
| V I + | *Rana, M. M., Van, H. N., & Ngoc, T. N. (2018). Effectiveness of a community-based IYCF support group programme among ethnic minorities in Vietnam. Field Exchange - Emergency Nutrition Network ENN, 58, 71–74. https://www.ennonline.net/attachments/2933/FEX_58_Vietnam_p71.pdf* | Vietnam | 2018 | Community-based infant and young child feeding (IYCF) support groups including groups providing support on breastfeeding, infant and young children feeding practices with mothers; groups providing support on infant and young children feeding practices with fathers, grandfathers and village leaders | Infants and young children under two, mothers, fathers, grandfathers, and village leaders | Propensity score matching | Mothers' knowledge on breastfeeding and complementary feeding (knowledge scores) | Mothers' knowledge of complementary feeding was significantly higher in the treatment group with community-based infant and young child feeding (IYCF) support groups than in the control group. There was a significant positive treatment effect of over 30 percentage points on the likelihood of boys up to two years old reaching minimum diet diversity (four food groups), but no effect on the likelihood of consuming iron-rich or fortified food. Minimum diet diversity of girls was not significantly different but the likelihood of consuming iron-rich or fortified food was 20 percentage points higher in the treatment than in the control group. There were no significant differences in the likelihood of stunting, wasting or underweight of the youngest child in the household between treatment and control group. Among children aged 0-5 months, the likelihood of stunting in the intervention group was 0 percent which is significantly lower than the 17 percent likelihood in the control group. | Gender transformative intervention (mothers and men targeted); Gender disaggregated analysis (except child anthropometrics) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| V III + | *Nguyen, P. H., Menon, P., Keithly, S. C., Kim, S. S., Hajeebhoy, N., Tran, L. M., Ruel, M. T., & Rawat, R. (2014). Program impact pathway analysis of a social franchise model shows potential to improve infant and young child feeding practices in Vietnam. Journal of Nutrition, 144(10), 1627–1636. https://doi.org/10.3945/jn.114.194464* | Vietnam | 2014 | Behaviour change interventions in the framework of Alive & Thrive through intensive or non-intensive interpersonal communication in addition to community mobilization and mass media | Children aged 6–24 months Children aged 24–60 months | Program impact pathway analysis using mixed methods including qualitative interviews in areas with intensive and non-intensive treatment | Program impact pathway components: 1) franchise management, 2) training and infant and young children feeding knowledge of health providers, 3) service delivery, 4) program exposure and utilization, 5) maternal behavioural determinants (knowledge, beliefs, and intentions) toward optimal infant and young children feeding practices, and 6) infant and young children feeding practices. | Mechanisms are in place for effective management of the social franchise system through which behaviour change interventions in the framework of Alive & Thrive were implemented, despite challenges to routine monitoring. Both in areas were behaviour change interventions combined community mobilization and mass media with intensive and with non-intensive interpersonal communication, health providers' knowledge of infant and young children feeding improved further but more so in areas with intensive treatment. Health providers showed greater technical knowledge and communication skills during counselling. Franchise utilization increased from 10% in 2012 to 45% in 2013 but fell below the expected frequency of 9–15 contacts per mother-child pair. Improvements in breastfeeding knowledge, beliefs and attitudes in support of optimal infant and young children feeding practices, intentions, and practices were greater among mothers in areas with intensive treatment as compared to non-intensive treatment. | Mothers targeted; Gender blind analysis | X |
| V V 0 | *Rawat, R., Nguyen, P. H., Tran, L. M., Hajeebhoy, N., Van Nguyen, H., Baker, J., Frongillo, E. A., Ruel, M. T., & Menon, P. (2017). Social franchising and a nationwide mass media campaign increased the prevalence of adequate complementary feeding in Vietnam: A cluster-randomized program evaluation. Journal of Nutrition, 147(4), 670–679. https://doi.org/10.3945/jn.116.243907* | Vietnam | 2017 | Behaviour change interventions in the framework of Alive & Thrive through intensive or non-intensive interpersonal communication in addition to community mobilization and mass media | Children aged 6–24 months Children aged 24–60 months | Non-blinded clustered randomised control trial with two treatment arms: a)intensive interpersonal communication in addition to community mobilization (CM), and mass media (MM), b) less intensive interpersonal communication in addition to CM and MM Difference-in-difference approach for intent-to-treat (ITT) estimates | Child feeding practices among children aged 6–24 months : 1) minimum dietary diversity 2) minimum meal frequency as appropriate for age, 3) minimum acceptable diet , 4) consumption of iron-rich or iron-fortified foods, and 5) timely introduction of solid, semisolid, or soft foods Prevalence of stunting, wasting and underweight among children aged 6–24 months and 24–60 months | There was a significant and substantial differential shift from early to timely introduction for water and rice and from late to timely introduction for vegetables and other milk between the ages of 6 and 9 months of age between the groups assigned to non-intensive and intensive interpersonal communication as part of behaviour change interventions in an Alive & Thrive program. Minimum diet diversity, minimum meal frequency, minimum acceptable diet, and consumption of iron-rich foods by children aged 6–24 months improved in both groups to similar extents. If mothers attended behaviour change interventions at least once, increases in children's minimum dietary diversity and minimum acceptable diet were significantly higher in the group with intensive as compared with non-intensive interpersonal communication.<br>The prevalence of stunting, wasting and underweight in children aged 24-60 months, and in children aged 6–24 months, declined in a non-differential way in both assigned groups. Mothers attending at least once Did not make a difference. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| O I + | *Kerr, R. B., Chilanga, E., Nyantakyi-Frimpong, H., Luginaah, I., & Lupafya, E. (2016). Integrated agriculture programs to address malnutrition in northern Malawi. BMC Public Health, 16(1), 1–14. https://doi.org/10.1186/s12889-016-3840-0* | Malawi | 2016 | Recipe days for men and women, a community-based participatory nutritional education intervention to promote healthy feeding of complementary foods for under-five children | Children under 5 by targeting men and women in rural households in northern Malawi | Qualitative before-after analysis | Reported experiences and perceptions on childcare and domestic work before and after the recipe day interventions (Separate interviews with husbands and wives) | Prior to recipe days, a participatory nutritional education intervention to promote healthy complementary feeding for under-five children as part of an integrated sustainable agriculture and nutrition project, hegemonic masculinity Did not foresee a role for men in child care and domestic work. Shame and negative peer pressure prevented men to engage in child care even if they showed some willingness. After the recipe days, respondents reported changes in gender roles and childcare responsibilities. Men reported to have understood the importance of childcare. They reported to feel an increased sense of responsibility for childcare and child nutrition and pride when contributing to childcare. Negative peer pressure is perceived to have reduced, which men appreciate. Women are perceived to have gained decision making and control of household resources, including food stocks, because men understood the importance for the family's nutrition. | Gender transformative intervention; Gender disaggregated analysis | X |
| | ***b) Child nutrition: Combined information and fortification campaigns*** | | | | | | | | | X |
| B V + | *Stewart, C. P., Dewey, K. G., Lin, A., Pickering, A. J., Byrd, K. A., Jannat, K., Ali, S., Rao, G., Dentz, H. N., Kiprotich, M., Arnold, C. D., Arnold, B. F., Allen, L. H., Shahab-Ferdows, S., Ercumen, A., Grembi, J. A., Naser, A. M., Rahman, M., Unicomb, L., … Null, C. (2019). Effects of lipid-based nutrient supplements and infant and young child feeding counseling with or without improved water, sanitation, and hygiene (WASH) on anemia and micronutrient status: Results from 2 cluster-randomized trials in Kenya and Bangladesh. American Journal of Clinical Nutrition, 109(1), 148–164. https://doi.org/10.1093/ajcn/nqy239* | Bangladesh | 2019 | Infant and young child feeding behaviour change messaging plus lipid-based nutrient supplements with/without Water, Sanitation and Hygiene (WASH) intervention | Infants and young children born from pregnant mothers selected into the study (aged 6-24 months) | Clustered (villages) randomised control trial with four treatment arms: a) Control; b) Nutrition intervention comprising infant and young child feeding behaviour change messaging plus lipid-based nutrient supplements ; c) Water, Sanitation and Hygiene (WASH); d) WASH plus nutrition intervention | Prevalence of anaemia, prevalence of iron deficiency anaemia Haemoglobin, ferritin, hepcidin, and vitamin B-12 concentrations in children's blood | As compared to the control group, children in both the treatment group with the nutrition intervention comprising infant and young child feeding behaviour change messaging plus lipid-based nutrient supplements and the treatment group with water, sanitation and hygiene (WASH) combined with the nutrition intervention had higher haemoglobin, ferritin, hepcidin, and vitamin B-12 concentrations in their blood. Soluble transferrin receptor was significantly lower. The WASH intervention Did not make a difference for these indicators versus the control group. As compared to the control group, children in treatment groups with WASH and WASH and nutrition combined had lower folate concentrations. As compared to the control group, the treatment groups with nutrition and WASH and nutrition combined had lower prevalence of anaemia and iron deficiency anaemia, almost eliminated. The evidence on vitamin A, vitamin B-12 and folate deficiencies is mixed. Child sex Did not make a difference for effects. | Gender accommodating intervention (targets household); Gender disaggregated analysis | X |
| B V + | *Roy, S. K., Fuchs, G. J., Mahmud, Z., Ara, G., Islam, S., Shafique, S., Akter, S. S., & Chakraborty, B. (2005). Intensive nutrition education with or without supplementary feeding improves the nutritional status of moderately-malnourished children in Bangladesh. Journal of Health, Population and Nutrition, 23(4), 320–330. https://pubmed.ncbi.nlm.nih.gov/16599102/* | Bangladesh | 2005 | Nutrition education with or without supplementary feeding | Moderately-malnourished (weight-for- age between 61% and 75% of median of the National Center for Health statistics standard) children aged 6-24 months | Clustered randomised control trial with three treatment arms: a) weekly intensive nutrition education for three months, b) nutrition education plus additional supplementary feeding, c) comparison group receiving nutrition education from community nutrition promoters twice a month | Ability of mothers to identify malnutrition Frequency of child feeding and home-based complementary feeding Anthropometrics: Weight, height-for-age, weight-for-height, weight-for-age z-scores | The frequency of child feeding and home-based complementary feeding improved significantly in the treatment groups with weekly intensive nutrition education and with nutrition education combined with supplementary feeding improved. Ability of mothers to identify malnutrition improved from 15% to nearly 100% in the treatment groups, but slightly reduced in the comparison group. After three months interventions, a significantly higher proportion of children in the treatment groups with weekly intensive nutrition education and with nutrition education combined with supplementary feeding improved (37% and 47% respectively) from moderate to mild malnutrition or normal nutrition compared to the comparison group (18%) (based on weight-for-age z-score). At the end of six months of observation, the nutritional status of children both treatment groups improved further from moderate to mild malnutrition or normal nutrition compared to the comparison group (59% and 86% vs 30%). | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B V + | *Smith, L. C., Khan, F., Frankenberger, T. R., & Wadud, A. K. M. A. (2013). Admissible Evidence in the Court of Development Evaluation? The Impact of CARE's SHOUHARDO Project on Child Stunting in Bangladesh. World Development, 41(1), 196–216. https://doi.org/10.1016/j.worlddev.2012.06.018* | Bangladesh | 2013 | Integrated child malnutrition project SHOUHARDO which includes: Food rations to children aged 6-24 months (and to pregnant and lactating mothers), monthly health and nutrition education for mothers, child growth monitoring and micronutrient supplementation for children (and mothers); Sanitation interventions; Women's empowerment interventions; Agronomic training | Children aged 6-24 months in poorest households in poor villages in four regions that are populated by marginalized groups because of adverse agro-climatic conditions that inhibit food production and economic activity (North Char, Mid Char, Haor, and Coast) | Comparison of change in stunting in children aged 6-24 months and comparison of age trajectory of stunting prevalence between age 6-24 months to 48-60 months in project areas versus national trend in rural Bangladesh. Propensity score matching to analyse effect on mean height-for-age z-score of participation in a) maternal and child health and Nutrition (MCHN) only, b) other interventions only, c) MCHN and other interventions, d) no participation. | Anthropometrics: Height-for-age z-score, prevalence of stunting | Stunting prevalence among children of households participating in the SHOUHARDO project reduced by 16 percentage points over a three-and-a-half year period while at a national level stunting was stagnant in rural Bangladesh. While at a national level in rural Bangladesh stunting prevalence sharply generally increased between age of 6-18 months to age 48-60 months, it Did not in project areas.<br>Based on propensity score matching, the project's women's empowerment interventions were found to have a strong independent impact on height-for-age z-scores of 6–24 month old children. Sanitation, women's empowerment, and crop production/fisheries promotion interventions in combination with maternal and child health and nutrition interventions had relatively strong impact on height-for-age z-scores. These findings confirm the relevance of addressing nutrition challenges together with structural causes of malnutrition.<br>The authors argue that each of these pieces of evidence alone would be entirely convincing, together they provide solid evidence of the project's impact. | Gender transformative intervention; Gender blind analysis of children's outcomes | X |
| B V + | *Aboud, F. E., & Akhter, S. (2011). A cluster-randomized evaluation of a responsive stimulation and feeding intervention in Bangladesh. Pediatrics, 127(5), 1191–1197. https://doi.org/10.1542/peds.2010-2160* | Bangladesh | 2011 | Sessions on responsive feeding and stimulation (RFS) albeit combined with a 6-month supply of Sprinkles (a commercially available fortified food powder) | Children aged 8 to 20 months and their mothers in rural Bangladesh | Clustered (villages) randomised control trial with three treatment arms: a) Sessions on responsive feeding and stimulation (RFS) b) RFS sessions plus a 6-month supply of Sprinkles (commercially available fortified Food powder), c) No intervention | Child developmental outcomes: Home Observation for Measurement Of the Environment (HOME) Inventory, mother-child responsive talk, And language development. Nutritional outcomes: Self-feeding, and mouthfuls eaten Anthropometrics: Weight, and height | Child developmental outcomes (Home Observation for Measurement of the Environment (HOME) Inventory, mother-child responsive talk, and language development) were better in the intervention groups, that received responsive feeding and stimulation sessions (RFS) albeit combined with Sprinkles (a commercially available fortified food powder), than in the control group. Mothers in the intervention groups recalled more messages at follow-up, especially pertaining to hygiene, self-feeding, responding, stimulating, and foods to feed. The number of mouthfuls ingested and self-fed mouthfuls were higher for children in the intervention groups than in the control group. Children in the intervention groups refused fewer mouthfuls. Control children ate a mean of 2.96 foods and the children in the intervention groups ate 3.07 foods but group differences were nonsignificant. Weight gain and weight-for-age z-scores were higher in the intervention group that RFS combined with Sprinkles than in the intervention group with only RFS and the control group. Height-for-age Did not significantly differ between groups. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B V + | *Christian, P., Shaikh, S., Shamim, A. A., Mehra, S., Wu, L., Mitra, M., Ali, H., Merrill, R. D., Choudhury, N., Parveen, M., Fuli, R. D., Hossain, M. I., Islam, M. M., Klemm, R., Schulze, K., Labrique, A., De Pee, S., Ahmed, T., & West, K. P. (2015). Effect of fortified complementary food supplementation on child growth in rural Bangladesh: A cluster-randomized trial. International Journal of Epidemiology, 44(6), 1862–1876. https://doi.org/10.1093/ije/dyv155* | Bangladesh | 2015 | Nutrition counselling combined with ready-to-use foods, or with fortified Blended food, or with Plumpy'doz (commercial medium quantity lipid-based nutritional supplement) | Children aged 6 months | Unblinded, clustered (community) randomised control trial with5 treatment arms: a) only nutrition counselling (control); b) nutrition counselling plus lipid-based ready-to-use foods (RUFS) with rice-lentil; 3) nutrition counselling plus RUFS with chickpea; 4) nutrition counselling plus fortified Blended food (wheat-soy-blend); 5) nutrition counselling plus Plumpy'doz Intention-to-treat analysis | Anthropometrics: height-for-age z-score, height-for-age z-score change between age of 6 and 18 months; height-for-age z-score, height and prevalence of stunting at 18 months; weight-for-height z-score and prevalence of wasting at 18 months | Overall, there was growth deceleration (low growth gain) in children between the age of 6 to 18 months. Growth deceleration in height-for-age z-score, however, was lower (by 0.02–0.04/month) in the treatment groups with nutrition counselling combined with Plumpy'doz (a lipid-based nutritional supplement), with ready-to-use foods (RUFS) with rice-lentil, and with chickpea-based RUFS relative to the control group with only nutrition counselling. The decline in weight-for-height z-scores was lower in the Plumpy'doz and chickpea groups than in the control group. Nutrition counselling plus fortified blended food (wheat-soy-blend) Did not impact (change in) height-for-age nor weight-for-height z-scores. The prevalence of stunting was significantly lower in treatment groups receiving Plumpy'doz and chickpea-based RUFS than in the control group. Mean height and height-for-age z-score at 18 months were significantly higher by 0.27–0.30 cm and 0.07–0.10, respectively, in all four treatment groups relative to the control. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |
| E V + | *Passarelli, S., Ambikapathi, R., Gunaratna, N. S., Madzorera, I., Canavan, C. R., Noor, A. R., Worku, A., Berhane, Y., Abdelmenan, S., Sibanda, S., Munthali, B., Madzivhandila, T., Sibanda, L. M., Geremew, K., Dessie, T., Abegaz, S., Assefa, G., Sudfeld, C., McConnell, M., … Fawzi, W. (2020). A chicken production intervention and additional nutrition behavior change component increased child growth in Ethiopia: A cluster-Randomized trial. Journal of Nutrition, 150(10), 2806–2817. https://doi.org/10.1093/jn/nxaa181* | Ethiopia | 2020 | Chicken production intervention with offered chicken and animal husbandry guidance combined with nutrition-sensitive behaviour change and home gardening intervention | Children aged 0–36 months | Clustered (villages) randomised control trial with three arms: a) Chicken production intervention, b) Chicken production intervention combined with nutrition-sensitive behaviour change, c) No intervention | Anthropometrics: Height-for-age z-score, weight-for-age z-score, weight-for-height z-score at 9 months (midline) and 18 months (endline) Intermediary outcomes: Chicken management practices, egg production and consumption, women's empowerment, income, child dietary diversity, child anaemia | Children in the treatment group with chicken production intervention combined with nutrition-sensitive behaviour change had higher height-for-age z-scores at midline (9 months intervention period) children in the control group without intervention, but lower weight-for-height z-scores. There were no significant differences between this treatment group's height-for-age, weight-for-age, nor weight-for-height z-scores and the control group at endline (18 months intervention period). At endline, in the treatment group with chicken production intervention combined with nutrition-sensitive behaviour change, women decision-making related to chicken and household income from chicken was higher, and children had higher egg consumption than in the control group. As compared to children in the treatment group with only chicken production intervention, when combined with nutrition-sensitive behaviour change, children had higher dietary diversity and egg consumption. | Mothers targeted; Gender aware analysis (controlled for sex of child) | X |
| E IV + | *Omer, A., Mulualem, D., Classen, H., Vatanparast, H., & Whiting, S. J. (2018). A Community Poultry Intervention to Promote Egg and Eggshell Powder Consumption by Young Children in Halaba Special Woreda, SNNPR, Ethiopia. Journal of Agricultural Science, 10(5), 1. https://doi.org/10.5539/jas.v10n5p1* | Ethiopia | 2018 | Complementary feeding with egg and eggshell powder supported with chickens as gift to families, education on poultry production and children's nutrition | (Mothers (or caregivers) of) children aged 6-12 months | Before-after comparison in with-without groups (Not a formal difference-in-difference analysis and limited sample size) | Egg and eggshell powder consumption by children aged 6-12 months | Mean egg consumption by children increased significantly to 17 eggs/month in the intervention group ($P < 0.001$), which accounts for more than 90% of the eggs produced, eggshell powder consumption increased as well. In contrast, in the control group, only a slight increase of 1 egg/month was observed and no change in eggshell powder consumption. After 6 months of intervention, dietary assessment showed significantly different egg and ESP consumption frequency in the intervention group. About 70% of the children had an intake of three or more eggs/week and eggshell powder for at least three days/week. More than 40% of the children ate five or more eggs/week and eggshell powder for at least five days/week and 20% of them consumed eggs and eggshell powder every day. | Mothers targeted; Gender blind analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| E V + | *Teshome, G. B., Whiting, S. J., Green, T. J., Mulualem, D., & Henry, C. J. (2020). Scaled-up nutrition education on pulse-cereal complementary food practice in Ethiopia: A cluster-randomized trial. BMC Public Health, 20(1), 1–12. https://doi.org/10.1186/s12889-020-09262-8* | Ethiopia | 2020 | Recipe-based complementary Feeding education including demonstration pulse supplemented complementary feeding in addition to nutrition education through health extension workers | (Mothers of) children aged 6–15 months | Cluster (sub-village level) randomised trial | Mothers' knowledge, attitude, and practices (KAP) towards pulses<br>Children's pulse consumption, children's dietary diversity score<br>Anthropometrics: Prevalence of stunting, wasting, and underweight | Mothers' knowledge, attitude, and practices (KAP) towards pulses among treatment group improved ($p < 0.001$) at midpoint (4 months) and end point (9months) compared to that of the control group, as Difference-in-Difference frequency of pulse consumption and dietary diversity score (DDS) among children. At 9 months, the prevalence of stunting, wasting, and underweight was significantly reduced in the intervention group compared to the control group. | Mothers targeted; Gender blind analysis | X |
| E IV + | *Negash, C., Belachew, T., Henry, C. J., Kebebu, A., Abegaz, K., & Whiting, S. J. (2014). Nutrition education and introduction of broad bean-based complementary food improves knowledge and dietary practices of caregivers and nutritional status of their young children in Hula, Ethiopia. Food and Nutrition Bulletin, 35(4), 480–486. https://doi.org/10.1177/15648265140 3500409* | Ethiopia | 2014 | Recipe-based complementary Feeding education including demonstration of a broad bean supplemented maize–barley porridge in addition to nutrition education supported by Alive & Thrive behavioural change communication material | Mothers of children aged 6-23 months in rural Ethiopia | Before-after comparison in with-without groups (Not a formal difference-in-difference analysis and limited sample size) | Mothers' knowledge and practice scores regarding complementary feeding<br>Children's dietary diversity<br>Children's height and weight | Mother's knowledge of complementary feeding in the intervention group increased in the intervention group while it remained unchanged in the no-intervention group. Practise of complementary feeding, more particularly applying correct steps used to prepare broad bean-based complementary food, preparing complementary food from at least four groups, and feeding frequency, was improved in the intervention group but Did not change in the no-intervention group.<br>At the end of the intervention, children in the intervention group consumed more pulses, meat, vegetables, roots, fruits, and milk. Pulses were regularly consumed by 45% of intervention children and 7% of control children. The increase in protein intake was higher in the intervention than in the no-intervention group. After 6 months of intervention, control and intervention children had similar gains in weight and height. | Mothers targeted; Gender blind analysis | X |
| N V 0 | *Hansford, F., Visram, A., Jones, E., & Ward, P. (2017). Integrated Evaluation Report of the WINNN Programme Operations Research and Impact Evaluation Integrated Evaluation Report of the WINNN Programme: Operations Research and Impact Evaluation. https://iati.fcdo.gov.uk/iati_documents/22257745.pdf* | Nigeria | 2007 | Working to Improve Nutrition in Northern Nigeria (WINNN) program: Micronutrient supplementation, community-based management of acute malnutrition (CMAM), infant and young child feeding interventions, and routine health care | (Mothers of) children aged 0–36 months in rural Northern Nigeria | Difference-in-difference analysis | Knowledge and infant and young child feeding practices among mothers/caregivers<br>Anthropometrics: Prevalence of stunting, wasting, and underweight | The intervention Working to Improve Nutrition in Northern Nigeria (WINNN) caused significant improvements in mothers' knowledge and practices regarding breastfeeding and complementary feeding from baseline to endline in the treatment areas. Some but not all of the improvements were attributable to WINNN's work in the treatment areas. Qualitative evidence also suggested positive changes in attitudes and knowledge among some fathers. The proportion of children appropriately fed nevertheless remained low at endline in treatment areas.<br>There were no statistically significant changes in the anthropometric status of children under three years from baseline to endline in the treatment areas. The prevalence of stunting, wasting and underweight Did not change and remained very high. This may be due to the lack of complementary nutrition-sensitive interventions in the areas, low coverage of the WINNN-supported interventions, insufficient time and contextual barriers, including high levels of poverty and infectious disease, poor maternal healthcare and nutrition, poor environmental health, low levels of formal education, and conservative gender roles and norms. | Gender transformative intervention; Gender blind analysis of children's outcomes | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B & E & V V + | *Panjwani, A., & Heidkamp, R. (2017). Complementary feeding interventions have a small but significant impact on linear and ponderal growth of children in low- and middle-income countries: A systematic review and meta-analysis. Journal of Nutrition, 147(11), 2169S-2178S. https://doi.org/10.3945/jn.116.243857* | Multiple (including Bangladesh, Ethiopia, & Vietnam) | 2017 | Complementary feeding interventions: Nutrition education or counselling alone, or complementary food supplementation interventions with or without nutrition education or counselling | (Mothers of) children aged 6–23 months | Systematic review including randomized controlled trials and controlled before-and-after studies in intervention and no-intervention groups | Anthropometrics: Height-for-age z score, weight-for-height z score, change in height-for-age and weight-for-height z-scores, height and weight gain | Nutrition education or counselling alone have small positive effects on height-for-age z-scores in food-secure settings, but no effect in food-insecure settings. They have no effect on weight-for-height z-scores. Overall, nutrition education or counselling is found to have an effect on height gain, but results are driven by effects in food-secure settings. There was no significant impact on weight gain.<br>All studies of interventions that provided food or nutritional supplementation, with or without nutrition education, included in the review were from food-insecure settings. Complementary food supplementation interventions with or without nutrition education have small but significant impact on height-for-age and weight-for-height z-scores, as well as on weight and height gain. | Mothers targeted; Gender blind analysis | X |
| | **(Consumer Behaviour – Technology)** | | | | | | | | | X |
| | ***c) Child nutrition: Programs offering fortification*** | | | | | | | | | X |
| E V + | *Samuel, A., Brouwer, I. D., Feskens, E. J. M., Adish, A., Kebede, A., De-Regil, L. M., & Osendarp, S. J. M. (2018). Effectiveness of a program intervention with reduced-iron multiple micronutrient powders on iron status, morbidity and growth in young children in Ethiopia. Nutrients, 10(10). https://doi.org/10.3390/nu10101508* | Ethiopia | 2018 | Low dose iron micronutrient powders in a local complementary feeding program | Children 6-11 months at baseline | Matching by districts combined with difference-in-difference analysis | Haemoglobin, anaemia, serum ferritin, iron deficiency, and iron deficiency anaemia Anthropometrics: height-for-age z-score, weight-for-height z-score, weight-for-age z-score, and height-for-age difference | Prevalence of anaemia and iron deficiency anaemia reduced in intervention children, who were given low iron dose micronutrient powder every other day for eight months, while they increased slightly in non-intervention children. Iron deficiency, however, increased in intervention children, decreased in non-intervention children. Adjusting for baseline prevalence, end line prevalence of anaemia and iron deficiency anaemia were not significantly different between the intervention and non-intervention groups.<br>A difference-in-difference analysis showed that mean height-for-age z-score and height-for-age difference were higher in the intervention than in the non-intervention group. Weight-for-height and weight-for-age z-scores did not differ.<br>The prevalence of stunting, wasting and underweight increased over time in both groups. The increase in stunting and underweight was smaller in the intervention than in the non-intervention group. The increase in wasting was similar in both groups. | Mothers targeted; Gender blind analysis | X |
| E III / | *Segrè, J., Winnard, K., Abrha, T. H., Abebe, Y., Shilane, D., & Lapping, K. (2015). Willingness to pay for lipid-based nutrient supplements for young children in four urban sites of Ethiopia. Maternal and Child Nutrition, 11, 16–30. https://doi.org/10.1111/mcn.12022* | Ethiopia | 2015 | Nutributter, a lipid-based nutrient supplement available in urban retail shops | Men and women with children aged 6–24 months in urban Ethiopia | Willingness to pay study | Willingness to pay | The estimated willingness to pay, measured with a Becker–Degroot–Marschak experiment, is about 0.80 USD for a week supply of Nutributter, a lipid-based nutrient supplement, which is lower than the potential retail price. At a realistic potential retail price, 25 % of respondents of the willingness to pay experiment would buy the product. A subsidy of 0.30 USD would be needed to convince 50 % of respondents, a subsidy of 0.70 USD to convince 90% of respondents. Full or part time employed parents had a willingness to pay that was 0.23 USD lower (P = 0.02) than unemployed parents. Parents with full grocery decision-making power had a willingness to pay 0.19 USD lower (P = 0.10) than parents who shared decision making. The wealthiest respondents had a median willingness to pay 0.18 USD higher than the least wealthy respondents. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
|---|---|---|---|---|---|---|---|---|---|---|
| B & E & V V + | *Tam, E., Keats, E., Rind, F., Das, J., & Bhutta, A. (2020). Micronutrient Supplementation and Fortification among Children Under-Five in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. Nutrients, 12(2), 1–30. https://doi.org/10.3390/nu12020289* | Multiple (including Bangladesh, Ethiopia, Vietnam) | 2020 | Single and multiple micronutrient Supplementation, lipid-based nutrient supplementation, fortification, and point-of-use-fortification with micronutrient powders | Children under five years of age in low- and middle-income countries | Systematic review of (quasi-experimental) non-randomised or randomised controlled trials, Controlled before-after studies, or interrupted time series studies | Anthropometrics: Body mass index, height, weight, height-for-age, weight-for-age, weight-for-height z-scores, head circumference, mid-upper arm circumference Anaemia, stunting, wasting, and underweight Micronutrient concentrations/deficiencies (folate, iron, haemoglobin concentration, vitamin A, vitamin D, and zinc) | Vitamin A significantly increased plasma retinol concentration. Zinc supplementation decreased the risk of zinc deficiency. Iron supplementation decreased risk of iron deficiency, iron deficiency anaemia, and anaemia, increased haemoglobin concentration and plasma/serum ferritin concentrations. Iron-folic acid supplementation significantly reduced risk of anaemia and increased haemoglobin concentrations.<br>Multiple micronutrient supplementation reduced risk of anaemia and iron deficiency, increased height, height-for-age z-score, and increased haemoglobin, plasma/serum ferritin, retinol, and zinc concentrations. Micronutrient powder supplementation is associated with lower risk of anaemia and iron-deficiency anaemia. It increased haemoglobin and plasma/serum ferritin concentrations. Lipid-based nutrient supplementation reduced risk of anaemia, stunting and underweight. It increased height-for-age z-score and weight-for-height z-score.<br>In sum, the risk of anaemia was reduced with iron alone, iron-folic acid, multiple micronutrient supplementation, fortification with micronutrient powders, targeted fortification, and large-scale fortification. Stunting and underweight were improved only among children who were provided with lipid-based nutrient supplementation. Multiple micronutrient supplementation slightly improved height-for-age z-scores. | Gender blind intervention; Some consideration of sex specific outcomes | X |
| B V + | *Pimpin, L., Kranz, S., Liu, E., Shulkin, M., Karageorgou, D., Miller, V., Fawzi, W., Duggan, C., Webb, P., & Mozaffarian, D. (2019). Effects of animal protein supplementation of mothers, preterm infants, and term infants on growth outcomes in childhood: A systematic review and meta-analysis of randomized trials. American Journal of Clinical Nutrition, 110(2), 410–429. https://doi.org/10.1093/ajcn/nqy348* | Multiple (including Bangladesh) | 2019 | Formula and food based animal protein supplementation | Infants and children under 5 years of age | Systematic review of randomised controlled trials | Height, height-for-age, weight, weight-for-age, weight-for-length, stunting, and wasting | Neither formula-based supplementation nor supplementation with food-based animal protein increased height in infants and young children under five. Height-for-age z-score increased through the food-based supplementation (+0.06 z-score) but decreased through formula-based supplementation (−0.11 z-score). Formula-based supplementation increased weight and weight-for-height, but Did not affect weight-for-age z-score. Food-based supplementation increased weight and a tendency to increase weight-for-height and weight-for-age was observed. Food-based supplementation reduced risk of stunting but not of wasting.<br>Children below the median age at follow-up showed stronger effects in the association of formula-based supplementation and weight and the association of food-based supplementation and weight-for-height. Above the median age food-based supplementation was associated with stronger effects on height and weight-for-age z-score. Studies from low and middle-income countries showed larger increases in weight and height than studies from high-income countries. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B V + | *Das, J. K., Salam, R. A., Hadi, Y. B., Sheikh, S. S., Bhutta, A. Z., Prinzo, Z. W., & Bhutta, Z. A. (2019). Preventive lipid-based nutrient supplements given with complementary foods to infants and young children 6 to 23 months of age for health, nutrition, and developmental outcomes. Cochrane Database of Systematic Reviews, 2019(5), 012611. https://doi.org/10.1002/14651858.CD012611.pub3* | Multiple (including Bangladesh) | 2019 | Lipid-based nutrient supplements given with complementary foods | Infants and young children aged 6-23 months in low and middle income countries including Bangladesh | Systematic review including randomised control trials and quasi-experimental studies | Prevalence of severe and moderate stunting, underweight, and wasting | As compared with no intervention, lipid-based nutrient supplements offered with complementary feeding reduce the prevalence of moderate stunting by 7% (Risk ratio (RR) 0.93, 95% confidence interval (CI) 0.88-0.98), severe stunting by 15% (RR 0.85, CI 0.74-0.98), moderate wasting by 18% (RR 0.82, CI 0.74-0.91), moderate underweight by 15% (RR 0.85, CI 0.80-0.91), and anaemia by 21% (RR 0.79, CI 0.69-0.90). There was no impact on severe wasting nor severe underweight.<br>As compared with fortified blended foods, lipid-based nutrient supplements with complementary feeding reduce the prevalence of moderate stunting (RR 0.89, CI 0.82-0.97), moderate wasting (RR 0.79, CI 0.65-0.97), and moderate underweight (RR 0.81, CI 0.73-0.91). There is no difference in severe stunting, severe wasting, nor severe underweight.<br>As compared with micronutrient powders, lipid-based nutrient supplements with complementary feeding reduce the prevalence of moderate underweight (RR 0.88, CI 0.78-0.99) and anaemia (RR 0.38, CI 0.21-0.68). There is no difference in moderate stunting nor moderate wasting. | Gender blind intervention and analysis | X |
| B V + | *Rah, J. H., De Pee, S., Halati, S., Parveen, M., Mehjabeen, S. S., Steiger, G., Bloem, M. W., & Kraemer, K. (2011). Provision of micronutrient powder in response to the cyclone sidr emergency in Bangladesh: Crosssectional assessment at the end of the intervention. Food and Nutrition Bulletin, 32(3), 277–285. https://doi.org/10.1177/156482651103200313* | Bangladesh | 2011 | Micronutrient powder (Pushtika, a multi-nutrient powder developed and marketed in a partnership between private sector and BRAC) backed with social marketing campaign | Children under 5 years of age (and pregnant or lactating women) severely affected by Cyclone Sidr in Bangladesh | With-without comparison within target groups, and with-without comparison within a non-targeted group of adolescent girls | Anthropometrics: Body mass index, height-for-age and weight-for-height z-scores<br>Anaemia based on haemoglobin levels | Pushtika, a multi-nutrient powder developed and marketed in a partnership between private sector and BRAC, sufficient for a period of 6 or 7 months, was distributed to children under 5 years of age (and pregnant or lactating women) severely affected by Cyclone Sidr in Bangladesh. The micronutrient<br>Powder was reported to be well accepted by children, with 78% having consumed more than 75% of the distributed sachets. There were no differences in anthropometrics of children nor in the prevalence of undernutrition between children who received micronutrient powder and those who Did not. There were no differences in haemoglobin levels and anaemia prevalence between children who received micronutrient powder and those who Did not. In the non-targeted group of adolescent girls anaemia prevalence was higher in the intervention areas than in the control areas. Possibly, the intervention has reduced initially higher anaemia prevalence in the target group as well. | Gender blind intervention and analysis | X |
| B V + | *Mahfuz, M., Alam, M. A., Das, S., Fahim, S. M., Hossain, M. S., Petri, W. A., Ashorn, P., Ashorn, U., & Ahmed, T. (2020). Daily supplementation with egg, cow milk, and multiple micronutrients increases linear growth of young children with short stature. Journal of Nutrition, 150(2), 394–403. https://doi.org/10.1093/jn/nxz253* | Bangladesh | 2020 | Food supplementation with daily egg, cow milk, and multiple micronutrient powder for 90 days | Children aged 12–18 months with short stature (height-for-age z-score (HAZ <1) in outskirts and slum areas of Dhaka | Difference-in-difference analysis | Compliance of daily milk and egg consumption, nutrient content and percentage of recommended dietary allowance in the intervention group<br>Height-for-age z-score | The offered supplementation of one egg, 150 ml of milk, and one sachet of micronutrient powder provided 33% of the required kcal of energy,92% recommended dietary allowance (RDA) of protein, 6% RDA of carbohydrate, 40% RDA of calcium, 188% RDA of iron, and 206% RDA of zinc. Compliance of egg consumption and milk consumption was nearly one hundred percent in the intervention group. 24-hour recall dietary intake data collected during nutrition intervention showed in improvement of intakes for energy, protein, iron, zinc, vitamins, and other trace elements in the intervention group. The intervention had a positive effect of 0.23 (CI 0.17,0.28, P<0.001) on children's height-for-age z-score. The effect was some stronger among children stunted at baseline, than among children at risk of stunting. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B II - | *Ahmed, T., Choudhury, N., Hossain, M. I., Tangsuphoom, N., Islam, M. M., de Pee, S., Steiger, G., Fuli, R., Sarker, S. A. M., Parveen, M., West, K. P., & Christian, P. (2014). Development and acceptability testing of ready-to-use supplementary food made from locally available food ingredients in Bangladesh. BMC Pediatrics, 14(1), 1–8. https://doi.org/10.1186/1471-2431-14-164*<br>*Sarma, H., Uddin, M. F., Harbour, C., & Ahmed, T. (2016). Factors Influencing Child Feeding Practices Related to Home Fortification with Micronutrient Powder among Caregivers of Under-5 Children in Bangladesh. Food and Nutrition Bulletin, 37(3), 340–352. https://doi.org/10.1177/0379572116645916*<br>*Afsana, K., Haque, M. R., Sobhan, S., & Shahin, S. A. (2014). BRAC's experience in scaling-up MNP in Bangladesh. Asia Pacific Journal of Clinical Nutrition, 23(3), 377–384. http://apjcn.nhri.org.tw/server/APJCN/23/3/377.pdf (https://doi.org/10.6133/apjcn.2014.23.3.22)* | Bangladesh | 2014 / 2016 | Ready-to-use supplementary food (RUSF) or multi-nutrient powder (Pushtikona, a multi-nutrient powder developed and marketed in a partnership between private sector and BRAC) | Infants and young children aged 6-24 months, and their caregivers | Ahmed et al. (2014): Randomised trial offering children: a) Ready-to-use supplementary food (RUSF) with rice-lentil, b) chickpea-based RUSF, c) packet of rice/lentil/oil/molasses with added multi-nutrient powder Pushtikona<br>Sarma et al. (2016): Qualitative in-depth interviews and focus group discussions with Caregivers, grandmothers, and fathers of under-5 children in areas where multi-nutrient powder Pushtikona is available<br>Afasana et al. (2014): Process evaluation | Ahmed et al. (2014):Acceptability of ready-to-use supplementary food (RUSF) or RUSF with added multi-nutrient powder Pushtikona by measuring the amount of food consumed by children, children's mothers' opinion on the food's colour, flavour, mouth feel, and overall acceptability (seven point hedonic scale)<br>Sarma et al. (2016): Use, regularity of use, and acceptability of multi-nutrient powder Pushtikona<br>Afasana et al. (2014): Knowledge and purchasing patterns of Pushtikona among mothers | Ahmed et al. (2014) found that children consumed on average about half of offered ready-to-use supplementary food (RUSF) and about one third of RUSF with added multi-nutrient powder Pushtikona. Mother's rated colour, flavour, mouth feel, and overall liking (seven point Hedonic Scale) high for all foods. Rice-lentil, and chickpea-based RUSF scored better compared to RUSF with Pushtikona in terms of overall liking (according to mothers).<br>Sarma et al. (2016) observed that both regular and irregular users of multi-nutrient powder Pushtikona initially bought very limited number of one to three sachets. With perceived increase in the child's appetite and health they continued buying it even if they faced financial constraints, else they stopped. Some never used Pushtikona because their husbands, or grandmothers, Did not support it due to lack of information, others because they suspected commercial motives of BRAC health workers induced by varying prices of Pushtikona. Neighbours' positive experiences and advice from health workers stimulate use. Irregular and limited availability impaired regular use.<br>A process evaluation by Afasana et al. (2014) showed that in areas where availability of Pushtikona was combined with intensive awareness raising and capacity building for infant and young children feeding practices (Alive & Thrive program), knowledge and purchasing patterns of Pushtikona among mothers were better. | Mothers targeted; Gender blind analysis | X |
| B III / | *Cummins, J., Gunadi, C., Vosti, S. A., Mridha, M. K., Matias, S. L., Maalouf-manasseh, Z., & Dewey, K. G. (2018). Hypothetical Willingness-to-Pay for Lipid-Based Nutrient Supplements and Micronutrient Powders for Children in Bangladesh. Fhi 360/ Fanta. Washington D.C.: U.S. Agency for International Development (USAID). Food and Nutrition Technical Assistance III Project. https://www.fantaproject.org/sites/default/files/resources/FANTA-Bangladesh-LNS-Pay-Apr2018.pdf* | Bangladesh | 2018 | Home fortification with lipid-based nutrient supplements (LNS) or micronutrient powder (Rang-Din Nutrition Study) | Children aged 6-24 months, women during pregnancy and the first 6 months postpartum | Hypothetical willingness-to-pay study Researcher-blind, longitudinal, cluster-randomized effectiveness trial with four arms: a) both children and pregnant or lactating women receive lipid-based nutrient supplements, b) children receive lipid-based nutrient supplements, c) children receive micronutrient powder, and d) control group | Levels of hypothetical willingness-to-pay for lipid-based nutrient supplements and micronutrient powder at given points in a child's development Effects on stated hypothetical willingness-to-pay of the random assignment to treatment | Most households have some positive valuation for both lipid-based nutrient supplements and micronutrient powder products. Yet, average household valuation of lipid-based nutrient supplements products is below the actual cost of production and the price paid by the Rang-Din Nutrition Study (US$0.11/sachet). Household experience with lipid-based nutrient supplements and micronutrient powder via randomised treatment arm assignment does not detectably alter the valuation of these products. | Gender blind intervention and analysis | X |

| | Reference | Country | Year | Innovation | Target group | Identification | Outcome indicators | Results | Gender | Return |
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| B V+ | *Dewey, K. G., Mridha, M. K., Matias, S. L., Cummins, J. R., Arnold, C. D., Young, R. T., Maalouf-Manasseh, Z., & Vosti, S. A. (2018). Effectiveness of Home Fortification with Lipid-Based Nutrient Supplements (LNS) or Micronutrient Powder on Child Growth, Development, Micronutrient Status, and Health Expenditures in Bangladesh. Washington D.C.: U.S. Agency for International Development (USAID). Food and Nutrition Technical Assistance III Project. https://www.fantaproject.org/sites/default/files/resources/RDNS-Child-Outcomes-Report-Dec2017.pdf* | Bangladesh | 2018 | Home fortification with lipid-based nutrient supplements (LNS) or micronutrient powder (Rang-Din Nutrition Study) | Children aged 6-24 months, women during pregnancy and the first 6 months postpartum | Researcher-blind, longitudinal, cluster-randomized effectiveness trial with four arms: a) both children and pregnant or lactating women receive lipid-based nutrient supplements, b) children receive lipid-based nutrient supplements, c) children receive micronutrient powder, and d) control group | Child anaemia and micronutrient status including haemoglobin, anaemia, iron status (ferritin and stfr), iron deficiency, iron-deficiency anaemia, and vitamin A status (RBP)<br>Children's weight-for-age z-score (WAZ), height-for-age z-score (HAZ), weight-for-height z-score (WHZ), head circumference-for-age z-score (HCZ), and mid-upper arm circumference-for-age z-score (MUACZ), prevalence of stunting, underweight and wasting | Lipid-based nutrient supplements had significant positive effects on height-for-age z-scores at 24 months intervention period. The difference was largest between treatment groups where both mothers and children received lipid-based nutrient supplements and where children received micronutrient powders. There was a reduction in stunting of about 20 % in the treatment group where both mothers and children received lipid-based nutrient supplements, which was 7.8 percentage points larger than in the group where children received micronutrient powders. There were also positive effects of lipid-based nutrient supplements on head circumference-for-age z-score at 24 months intervention period, with a significant difference of 0.15 between the group where both mothers and children received lipid-based nutrient supplements and the control group. The differences were marginally significant overall, but highly significant among girls. At 18 months intervention period, as compared to the control group, prevalence of wasting was reduced by 27% in the group where children received lipid-based nutrient supplements. | Mothers targeted; Gender disaggregated analysis | X |
| N II / | *Korenromp, E. L., Adeosun, O., Adegoke, F., Akerele, A., Anger, C., Ohajinwa, C., Hotz, C., Umunna, L., & Aminu, F. (2016). Micronutrient powder distribution through Maternal, Neonatal and Child Health Weeks in Nigeria: Process evaluation of feasibility and use. Public Health Nutrition, 19(10), 1882–1892. https://doi.org/10.1017/S1368980015002499* | Nigeria | 2016 | Micronutrient powder | Children aged 6–59 months | Feasibility study using process evaluation based on repeated cross-sectional surveys of caregivers, cross-sectional surveys of health workers involved in micronutrient powder distribution, Facility-based observations of micronutrient powder distribution activities | Caregivers' awareness of micronutrient powder Micronutrient powder acceptability, use and adherence among caregiver-child pairs who received micronutrient powder Health worker knowledge of micronutrient powder and six month history of micronutrient powder distribution practice Facility-based observations of micronutrient powder and behaviour change communication material distribution, micronutrient powder counselling and health education, and routine recording in micronutrient powder registers | A feasibility study for micronutrient powder distribution during (Korenromp et al. 2016). The eight million micronutrient powder sachets delivered over three distribution events during child health weeks in Nigeria were estimated to reach about one-third of eligible children in the area at each event. Programme fidelity was limited by shortages of micronutrient powder, behaviour change communication materials and inadequate social mobilization, and some limitations in health worker training and engagement. Micronutrient powder use was consistent with the recommended two or three sachets per week in 51 up to 69 % of caregivers who received micronutrient powder and were surveyed at home. | Mothers targeted; Gender blind analysis | X |

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| V II + | *Van Hoan, N., Van Phu, P., Salvignol, B., Berger, J., & Trèche, S. (2009). Effect of the consumption of high energy dense and fortified gruels on energy and nutrient intakes of 6-10-month-old Vietnamese infants. Appetite, 53(2), 233–240. https://doi.org/10.1016/j.appet.2009.07.002* | Vietnam | 2009 | High energy dense gruels fortified with food supplements containing amylases (i.e. Enzymes that catalyse the hydrolysis of starch into sugars), calcium, iron, zinc and vitamin A offered daily for six months. | Breast-fed infants aged 5 months, free from severe malnutrition in villages with high prevalence of stunting | Village-randomized controlled study with three treatment groups: a) gruel prepared with instant infant rice-based flour fortified with micronutrients, b) traditional gruel with added soybean-based micronutrient fortification, and c) non-fortified traditional gruel | Energy and micronutrient density of products<br>Total energy and macronutrient intakes per day<br>Total micronutrient intakes per day | Median daily energy intakes of infants from instant flour fortified gruels and traditional gruels fortified with micronutrients Did not differ but, expressed in kg body weight, were respectively 53% and 58% higher than in the control group offered non-fortified gruels. Mean daily protein intakes were 76% and 88% higher than in the control group. Lipid intakes were also higher with fortified gruels as compared non-fortified gruels.<br>Median mineral intakes of infants who were offered traditional gruels fortified with micronutrients were significantly higher than when offered instant flour fortified gruels or non-fortified gruels. The median intakes of calcium by infants offered instant flour fortified gruels, respectively traditional gruels fortified with micronutrients, were 3.9 and 5.7 times higher as compared to intakes in the control group offered non-fortified gruels. Intakes of iron 13.7 and 14.8 times higher, intakes of zinc 2.7 and 3.6 times higher. | Gender blind intervention and analysis | X |
| V V + | *Phu, P. V., Hoan, N. V., Salvignol, B., Treche, S., Wieringa, F. T., Dijkhuizen, M. A., Khan, N. C., Tuong, P. D., Schwartz, H., & Berger, J. (2012). A six-month intervention with two different types of micronutrient-fortified complementary foods had distinct short- and long-term effects on linear and ponderal growth of Vietnamese infants. Journal of Nutrition, 142(9), 1735–1740. https://doi.org/10.3945/jn.111.154211* | Vietnam | 2012 | High energy dense gruels fortified with food supplements containing amylases (i.e. Enzymes that catalyse the hydrolysis of starch into sugars), calcium, iron, zinc and vitamin A offered daily for six months. | Breast-fed infants aged 5 months, free from severe malnutrition in villages with high prevalence of stunting | Village-randomized controlled study with three treatment groups: a) gruel prepared with instant infant rice-based flour fortified with micronutrients, b) traditional gruel with added soybean-based micronutrient fortification, and c) non-fortified traditional gruel | Anthropometrics: weight, height, height-for-age z-score, weight-for-age z-score, weight-for-height z-score, body mass index (BMI) z-score, prevalence of stunting and wasting | After six months of intervention, weight, height, height-for-age z-score (HAZ) and weight-for-age Z-score were significantly higher in the two groups who received fortified gruels as compared with the control group who received non-fortified gruels, with an estimated effect of +0.22 HAZ of instant flour fortified gruels and +0.21 HAZ of traditional gruels fortified with micronutrients. Eighteen months after the intervention, HAZ in the instant flour fortified gruels group was 0.17 greater than that in the control group but not different from the traditional gruels with micronutrient fortification. Weight-for-height z-score and body mass index z-score were greater in the instant flour fortified gruels group than in the traditional gruels with micronutrient fortification group. The control group had intermediate z-scores, not significantly different from the other groups. | Gender blind intervention; Gender aware analysis (controlling for sex of child) | X |
| V V 0 | *Berger, J., Ninh, N. X., Khan, N. C., Nhien, N. V., Lien, D. K., Trung, N. Q., & Khoi, H. H. (2006). Efficacy of combined iron and zinc supplementation on micronutrient status and growth in Vietnamese infants. European Journal of Clinical Nutrition, 60(4), 443–454. https://doi.org/10.1038/sj.ejcn.1602336* | Vietnam | 2006 | Daily iron, zinc, iron–zinc supplementation | Breast-fed infants aged 4–7 months in rural Vietnam | Double blinded, placebo controlled randomised control trial with four treatment groups: a) daily iron supplements for six months, b) daily zinc supplements, c) daily iron-zinc supplements, and d) a placebo group | Micronutrient deficiency and anaemia based on haemoglobin, serum ferritin and zinc<br>Anthropometrics: height-for-age z-score, weight-for-age z-score, weight-for-height z-score, prevalence of stunting and wasting | As compared to a placebo and zinc supplementation, positive haemoglobin and serum ferritin changes between baseline and endline were larger with daily iron and iron-zinc supplements. Positive serum zinc changes were larger with daily zinc and iron-zinc supplementation than a placebo and iron supplementation.<br>The prevalence of anaemia and iron deficiency decreased significantly with daily iron and iron-zinc supplements. With zinc supplements and placebo, the prevalence of anaemia and iron deficiency anaemia decreased significantly and the prevalence of iron deficiency increased.<br>Height-for-age z-score, weight-for-age z-score, weight-for-height z-score decreased significantly regardless of treatments or placebo. The prevalence of stunting and wasting was not significantly different between treatments, nor placebo.<br>There were no significant differences in treatment effects between boys and girls. | Gender blind intervention; Gender disaggregated analysis | X |

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| V V + | ***Smuts, C. M., Lombard, C. J., Spinnler Benadé, A. J., Dhansay, M. A., Berger, J., Le, T. H., López De Romaña, G., Untoro, J., Karyadi, E., Erhardt, J., & Gross, R. (2005). Efficacy of a foodlet-based multiple micronutrient supplement for preventing growth faltering, anemia, and micronutrient deficiency of infants: The four country IRIS trial pooled data analysis. Journal of Nutrition, 135(3), 631–638. https://doi.org/10.1093/jn/135.3.631s (International Research on Infant Supplementation (IRIS) Study Group)*** | Multiple (including Vietnam) | 2005 | Multiple micronutrient supplement and iron supplement for six months | Children aged 6–11 months in locations in South Africa, Peru, Vietnam, and Indonesia where anaemia and Vitamin A deficiency affected at least 30% of the preschool child Population | Double blinded, placebo controlled randomised control trial with four treatment groups a) placebo, b) weekly multiple micronutrient supplement, c) daily multiple micronutrient, and d) daily iron supplements | Anthropometrics: height-for-age z-score, weight-for-age z-score, weight-for-height z-score, weight gain (kg/month), height gain (cm/month) Micronutrient deficiency and anaemia based on haemoglobin, plasma ferritin, plasma retinol, plasma zinc, and riboflavin status | Daily multiple micronutrient supplements induced a significantly greater weight gain than weekly multiple micronutrient, daily iron supplements and a placebo. There were no significant effects of treatment on height gain, height-for-age z-score, weight-for-age z-score, nor weight-for-height z-score.<br>As compared to a placebo, daily, weekly multiple micronutrient, and daily iron supplements had positive effects on haemoglobin levels, daily multiple micronutrient and iron supplements on plasma ferritin, daily multiple micronutrient supplements on plasma retinol, riboflavin and plasma tocopherol. Plasma zinc concentration decreased less with daily multiple micronutrient supplements.<br>The prevalence of anaemia declined most with daily multiple micronutrient supplements. Iron deficiency prevalence decreased in the daily multiple micronutrient and iron supplements groups, increased in other groups. Vitamin A deficiency prevalence reduced most with daily and weekly multiple micronutrient supplements. Zinc deficiency prevalence decreased with daily multiple micronutrient supplements, increased with daily iron supplements. Riboflavin deficiency prevalence decreased with daily multiple micronutrient supplements. | Gender blind intervention and analysis | X |

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