



2020 Annual Report

FORTIFYING NUTRITION
IN A PANDEMIC



Food Fortification Initiative
Enhancing Grains for Healthier Lives



Photo: Susanne Nilsson

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About Us

The Food Fortification Initiative (FFI) champions effective grain fortification so people have the nutrition they need to be smarter, stronger, and healthier.

FFI provides unique expertise, rigor, and focus to help country leaders plan, implement, and monitor fortification of industrially milled wheat flour, maize flour, and rice. Established in 2002, we are a public, private, and civic partnership based at Emory University.


What is fortification?

Food fortification—sometimes referred to as food enrichment—is when food producers add essential vitamins and minerals missing in a population’s diet to food that people eat every day.

Humans need vitamins and minerals, called micronutrients, in small amounts to function

optimally. The consequences of micronutrient deficiencies can be extensive, including devastating birth defects for pregnant women and babies, impaired brain development in young children, and reduced work capacity among adults.

Fortification is a large-scale, relatively inexpensive way to prevent micronutrient deficiencies, increase productivity, and save lives.



“We champion effective grain fortification so people have the nutrition they need to be smarter, stronger, and healthier.”

Photo: Dominic Chavez/World Bank



Photo: Xaume Olleros/RTI

FFI's Unique Contributions

to Global Grain Fortification



Expertise

FFI's in-house leadership and technical expertise enables us to apply a data-driven approach to program planning, implementation, and monitoring.



Rigor

FFI operates through a unique model, bringing together voices from the public, private, and civic sectors through our Executive Management Team and our technical assistance to make sustainable change.

FFI conducts supply chain analyses for any given grain to discover and act on opportunities to advance fortification.

FFI documents and publishes 195 countries' annual potential and progress toward successful cereal grain fortification.



Focus

FFI is the only global group that focuses exclusively on large-scale fortification of the three most consumed grains: wheat flour, maize flour, and rice.

Inspired by the Good to Great model by Jim Collins

How We Work

FFI's strategic approach to scaling large-scale grain fortification, which is based on two decades of experience conducting research and providing on-the-ground assistance, offers a replicable approach to building and strengthening fortification programs.

FFI chooses geographies, regions, states and

provinces through rigorous research. We take a holistic, objective approach with the goal to help eliminate micronutrient deficiencies in every country in the world where industrially milled cereal grain is commonly consumed. FFI does not have a predetermined set of countries it will support; instead, it relies on data to identify where the needs and opportunities are greatest.



MILESTONE

Photo: Freshly threshed rice in India. Neil Palmer/CIAT

Before FFI begins working in a country, we use data to determine two essential requirements: demonstrated need for fortification and the potential to make a positive impact on health through fortified food. Our data comes from several sources and through varied methods that include consumption and milling analyses, nutrition needs assessments, market analyses, political readiness assessments, current fortification reviews, and partner interviews. Once an opportunity for fortification is determined, FFI uses a four-stage phased approach to help countries plan, implement, and monitor a fortification program that can generate and sustain large-scale impact.

Plan

PHASE 1: EXPLORE AND ENGAGE

- Engage private sector
- Engage birth defects groups, neurosurgeons, and consumer associations
- Identify key challenges and opportunities
- Identify a champion/champions within government
- Determine what it will take to move forward

MILESTONE

Once the government expresses permission and willingness to move to next phase, FFI will move to the next phase of planning: map the context.

PHASE 2: MAP THE CONTEXT

- Conduct a thorough supply chain analysis
- Assess industry structure including readiness and reach of mills
- Assess monitoring structure and needs
- Map the legislative process
- Assess budgetary needs (initial investment by sector and annual recurring costs) to ensure commitment and sustainability
- If necessary, conduct a cost-benefit analysis making the case for fortification's impact on national health and economic indicators

MILESTONE

At this stage, FFI gives a formal presentation to government to recommend effective staples and market channels based on diagnostic results. Once the government expresses permission and support of the plan, FFI will move to the next phase: implement - design and develop.

Implement

PHASE 3: DESIGN AND DEVELOP

- Draft recommended standards
- Identify miller, regulatory inspector, and laboratory training needs
- Support premix procurement process
- Engage the legislative process
- Develop a communication and education strategy
- Integrate realistic fortification monitoring into existing framework

MILESTONE

Clear budget and implementation plan.

- Train millers on QA/QC practices
- Train regulatory monitoring inspectors and lab staff; map agency responsibilities
- Facilitate the passage of legislation
- Develop a National Fortification Guidelines document and national logo, as necessary

MILESTONE

Fortification program is implemented and ready to scale.

Monitor

PHASE 4: MONITOR FOR COMPLIANCE AND IMPACT

- Support collection of monitoring data
- Ensure monitoring data is shared with relevant stakeholders
- Augment government monitoring partnerships with civic entities
- Ensure action is taken to improve program performance based upon monitoring data
- As relevant, partner with stakeholders to measure impact

MILESTONE

Ensure program reaches intended population

Why Fortify?

Nutrition can be a matter of life and death. An estimated 2 billion people globally suffer from vitamin and mineral deficiencies.¹

Fortifying grains to improve nutrition has tremendous implications for individuals, entire populations, and a country's economy.

Anemia is often caused by deficiencies of micronutrients including iron and zinc. Pregnant women with severe anemia are twice as likely to die during or shortly after pregnancy than non-anemic women.²

Anemia affects an estimated:³

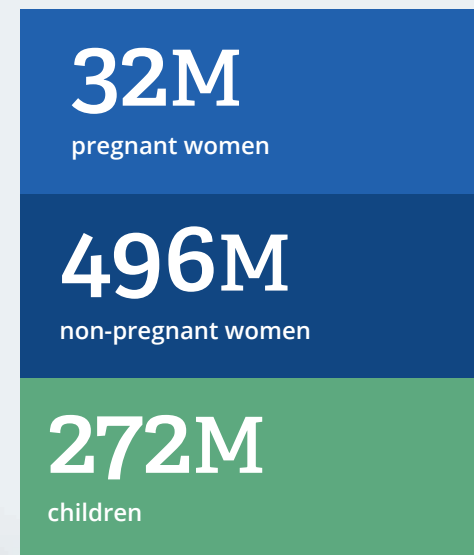


Photo: Xaime Olleror/RTI

Iron deficiency in childhood stunts cognitive development which hinders academic performance and future earnings potential as adults.⁴

Zinc deficiency adversely affects children and adults by weakening immune systems, increasing rates of childhood diarrhea and pneumonia, and contributing to increased rates of childhood stunting. **Globally, zinc deficiency contributes to 116,000 child deaths per year**—a number that would be much higher if researchers were able to count the number of deaths caused by preterm births in zinc-depleted mothers.⁵

Anencephaly and spina bifida are birth defects of the brain and spine that can be prevented by consuming enough folic acid, also known as vitamin B9.

About 75% of children born with brain and spinal birth defects die before their fifth birthday.⁶ Though spina bifida has varying degrees of severity, it often leads to life-long disability and enormous costs for healthcare systems. Anencephaly is always fatal.

Vitamin B12 benefits children, adults, and the elderly by maintaining functions of the brain and nervous system.⁷ Consuming adequate amounts of vitamin B12 can reduce the risk of developing chronic diseases including heart disease, stroke, dementia, Alzheimer's disease, and Parkinson's disease.⁷

Fortification with micronutrients including iron, zinc, folic acid, and other B vitamins benefit individuals at every point in life—from conception to aging.



Photo: Dominic Chavez/World Bank

A call to action

Research published using FFI data credited fortification with preventing 62,670 brain and

spine birth defects globally in one year for an average of 172 healthier babies a day.⁸ Yet according to estimates, an additional 82% of birth defects

of the brain and spine⁸ and 34% of anemia⁹ could still be prevented globally through adequate intake of iron and folic acid.



Photo: Dominic Chavez/World Bank



Photo: Yamanaka Tamaki

- 1 von Grebmer, K., et al. [2014. Global health index: the challenge of hidden hunger.](#) Welthungerhilfe, International Food Policy Research Institute, and Concern Worldwide. 2014.
- 2 Daru, J., et al. [Risk of maternal mortality in women with severe anemia during pregnancy and postpartum: a multilevel analysis.](#) The Lancet Global Health. 2018.
- 3 World Health Organization. [The global prevalence of anemia in 2011.](#) 2015.
- 4 Horton, S. and J. Ross. [The economics of iron deficiency.](#) Food Policy. 2003.
- 5 Black, R., et al. [Maternal and child undernutrition and overweight in low-income and middle-income countries.](#) The Lancet. 2013.
- 6 Blencowe, H., et al. [Estimates of global and regional prevalence of neural tube defects for 2015: a systematic analysis.](#) Annals of the New York Academy of Sciences. 2018.
- 7 Beckett, E., et al. [Reduced plasma homocysteine levels in elderly Australians following mandatory folic acid fortification: a comparison of two cross-sectional cohorts.](#) Journal of Nutrition and Intermediary Metabolism. 2017.
- 8 Kancherla, V., et al. [A 2019 global update on folic acid-preventable spina bifida and anencephaly.](#) Birth Defects Research. 2020; 1– 13.
- 9 Keats, E., et al. [Improved micronutrient status and health outcomes in low- and middle-income countries following large-scale fortification: evidence from a systematic review and meta-analysis.](#) American Journal of Clinical Nutrition. 2019.

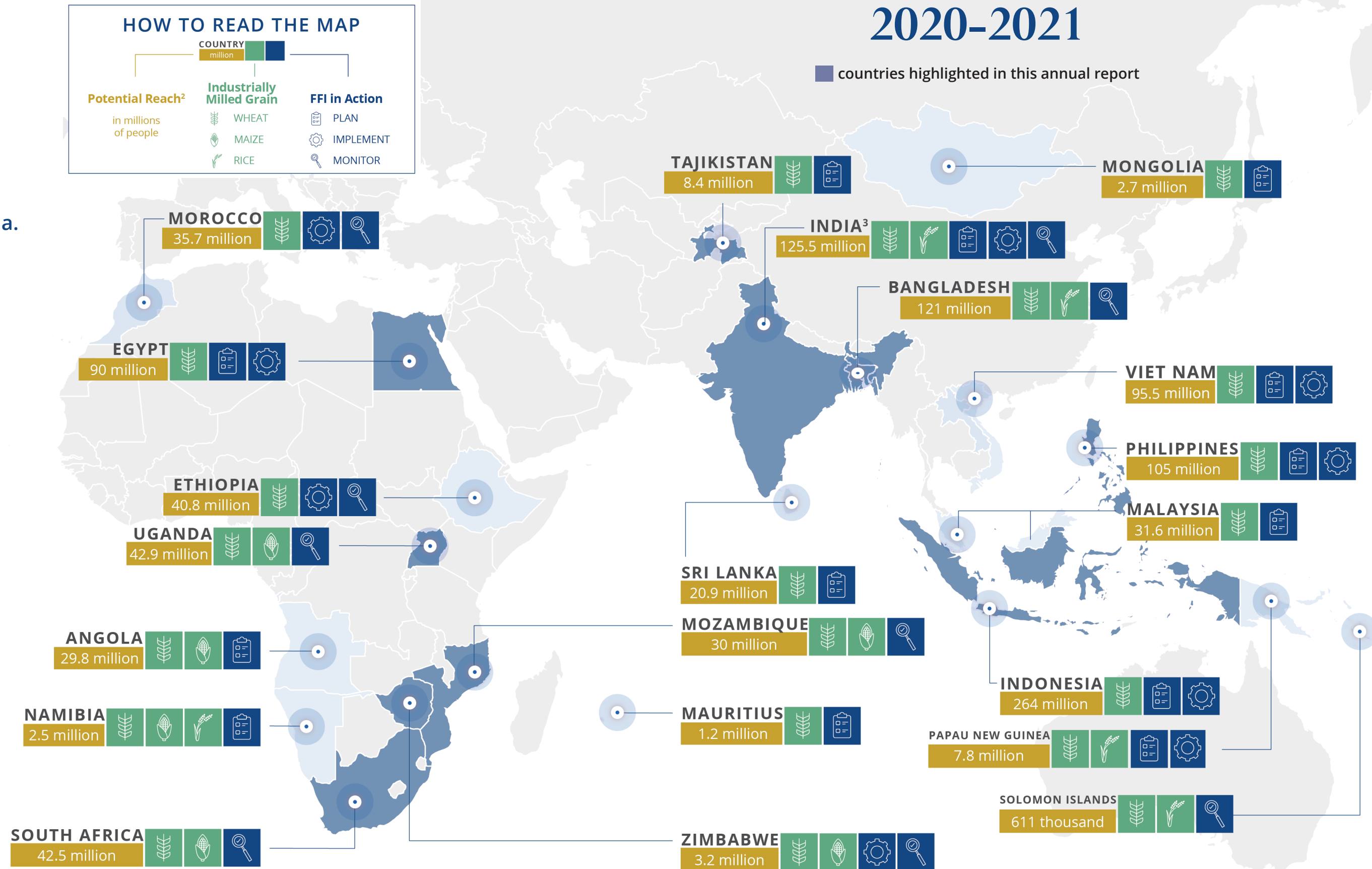
FFI Around the World

Despite challenges presented by the pandemic in 2020, FFI provided technical assistance for grain fortification in 21 countries across four regions: Africa, Asia-Pacific, Europe, and India.

This report highlights a snapshot of FFI's work globally. Though they may not be included in the report, many of the countries that FFI supported in 2020 made strides towards building a smarter, stronger, and healthier future through grain fortification.

Working closely with our partners, we contributed to or began contributing to reducing the risk of micronutrient deficiencies for nearly 1 billion people.¹

¹ Total estimate only includes countries that FFI supported in 2020. Estimate calculated by multiplying total population by the coverage rate of the industrially milled grain. Coverage rate is the percentage of population that consumes an industrially milled grain multiplied by the percentage of industrial mills able to fortify the grain.
² Potential reach calculated by multiplying total population by the coverage rate of the industrially milled grain.
³ FFI's works in the following four Indian states: Haryana, Himachal Pradesh, Maharashtra, and West Bengal.



Fortification in a Pandemic

The past year challenged and changed our world—and our work.

COVID-19 exacerbated an already pressing crisis of micronutrient deficiencies. The physical distancing and lockdowns needed to curb the spread of the disease reduced incomes for families, businesses, and governments and disrupted ongoing fortification, health, and social protection programs and supplies of nutritious foods in an inequitable way. It is likely these shocks increased multiple forms of malnutrition, including the hidden hunger of micronutrient deficiency.¹

A 2020 study estimated that the pandemic would indirectly cause 168,000 additional child deaths, 2.1 million maternal anemia cases, and US \$29.7 billion future productivity losses due to excess stunting and child mortality by 2022 if interventions to reduce the burden of malnutrition did not scale up quickly.² In 2020, FFI's work was more important than ever, and we stepped up to meet the increased need.

Large-scale fortification of staple foods including wheat flour, maize flour, and rice was—and continues to be—critical to counter the frightening rise in micronutrient malnutrition as a result of the COVID-19 pandemic.

Confronting COVID-19's Challenges

Fortification of staple food at scale relies on international supply chains, and disruptions to

global trade in 2020 impacted some countries' ability to fortify. For example, fortification programs in Africa are almost entirely reliant on imported premix (the vitamins and minerals used in fortification) and fortifiable staples like grains are typically imported prior to processing and fortification in-country. In short, the success of fortification programs in many low- and middle-income countries depend on favorable that do not comply with national fortification standards. international trade conditions, to which the COVID-19 pandemic poses a significant challenge.

Effective food fortification programs also rely on strong quality control and surveillance systems at country-level, with essential roles to be played by private sector companies, government, and civil society. In many countries, restrictions on movement prevented routine regulatory enforcement and monitoring of fortified foods, constraining civil society initiatives to support fortification programs and hold duty bearers accountable, and blocking government efforts to assess and track micronutrient deficiencies in the population. Many fortified food producers will continue to meet national fortification standards, whether enforcement mechanisms are active or not. Nevertheless, reduced enforcement lowers the bar for everyone, making it more difficult for responsible producers to compete with those with those that do not comply with national fortification standards.

Building the Way to a Healthier Future

But difficult times often inspire innovation and progress, and the past year was filled with FFI and partners' creative solutions to serious challenges.

In 2020, FFI had two top priorities: to continue to assist countries in the planning, implementation, and monitoring of sustainable fortification programs and also to navigate new hurdles from COVID-19. We were flexible; our organizational structure allowed us to adjust to changing environments and respond quickly. We innovated new ways of providing technical assistance. We hosted meetings and trainings

virtually. We conducted monitoring visits and mill readiness assessments with phones and webcams. And we moved forward with a renewed sense of purpose and importance for the critical work of preventing micronutrient malnutrition.

Just as the pandemic did not end in 2020, the challenges to global nutrition will not end with the pandemic. Yet we remain optimistic that the pandemic will be a catalyst for bold change and a smarter, stronger, and healthier future for all.

- 1 Headey, D., et al. [Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality](#). The Lancet. 2020.
- 2 Osendarp, S., et al. [The potential impacts of the COVID-19 crisis on maternal and child undernutrition in low and middle income countries](#). Research Square. 2020.



Photo: Ousmane Traore/World Bank

AFRICA

EGYPT

90 million
potential reach

Despite challenges posed by the pandemic, Egypt pushed ahead to restart the country's wheat flour fortification program, on hold since 2014.

Within the Egyptian government, the pandemic reinforced the importance of health, nutrition, and the establishment of strong systems that produce and distribute nutritious food, including wheat flour fortification. As a result of the government's strong commitment, Egypt made significant progress in 2020 toward establishing a robust fortification program.

With FFI's support, Egypt's Ministry of Supply and Internal Trade (MOSIT) conducted an assessment to map opportunities and challenges and built a coalition of stakeholders to implement fortification. The coalition included MOSIT and the Minister of MOSIT, His Excellency Dr. Ali Moselhi; private and public sector grain millers; bread bakers; and in-country development partners like the World Food Programme and UNICEF.

In addition, FFI and partners in Egypt accomplished the following key milestones:

- completed a full mill assessment that itemizes each mill's needs, condition, status of micro-ingredient feeders, and readiness to fortify;
- formed a high-level committee, which includes MOSIT, FFI, and the World

Food Programme, to oversee the flour fortification program;

- begun production of an advocacy tool that documents the program's progress to date and its significance to Egypt. This advocacy tool, which includes video interviews with key stakeholders, will help raise awareness among leaders and policy makers of the importance of flour fortification, especially in light of the COVID-19 pandemic;
- secured the Egyptian National Food Safety Authority's full commitment to support the program and engage with technical staff to enable effective means of ensuring program compliance through the drafting and operationalizing of an Egypt-specific Monitoring Guideline for Fortification.
- discussed engagement and support for the program with the private sector; and
- garnered the full support of all key stakeholders in flour fortification as well as the donor agencies involved in the program.



Photo: Jordi Vaque/FAO

Monitoring Challenge Workshop

When the pandemic forced FFI to cancel the in-person Monitoring Challenge Workshop scheduled for May 2020 in Johannesburg, South Africa, FFI was quick to think out of the box.

After surveys and a thorough landscape analysis of online meeting platforms, FFI opted to hold a virtual Monitoring Challenge Workshop on an online collaboration hub called Slack that allows participants to communicate without temporal or language barriers. Slack enabled participants to share country-specific presentations and hold discussions within uniquely designed “channels” among country teams and among all workshop participants.

FFI invited 10 African countries that fortify 75% or more of their wheat flour and that had attempted or were currently attempting to put in place regulatory monitoring structures but needed assistance in the establishment of such structures and frameworks: Cameroon, Côte d’Ivoire, Ghana, Kenya, Mozambique, Nigeria, Senegal, South Africa, Tanzania, and Uganda. The meeting kicked off in August 2020 and wrapped up in October 2020.

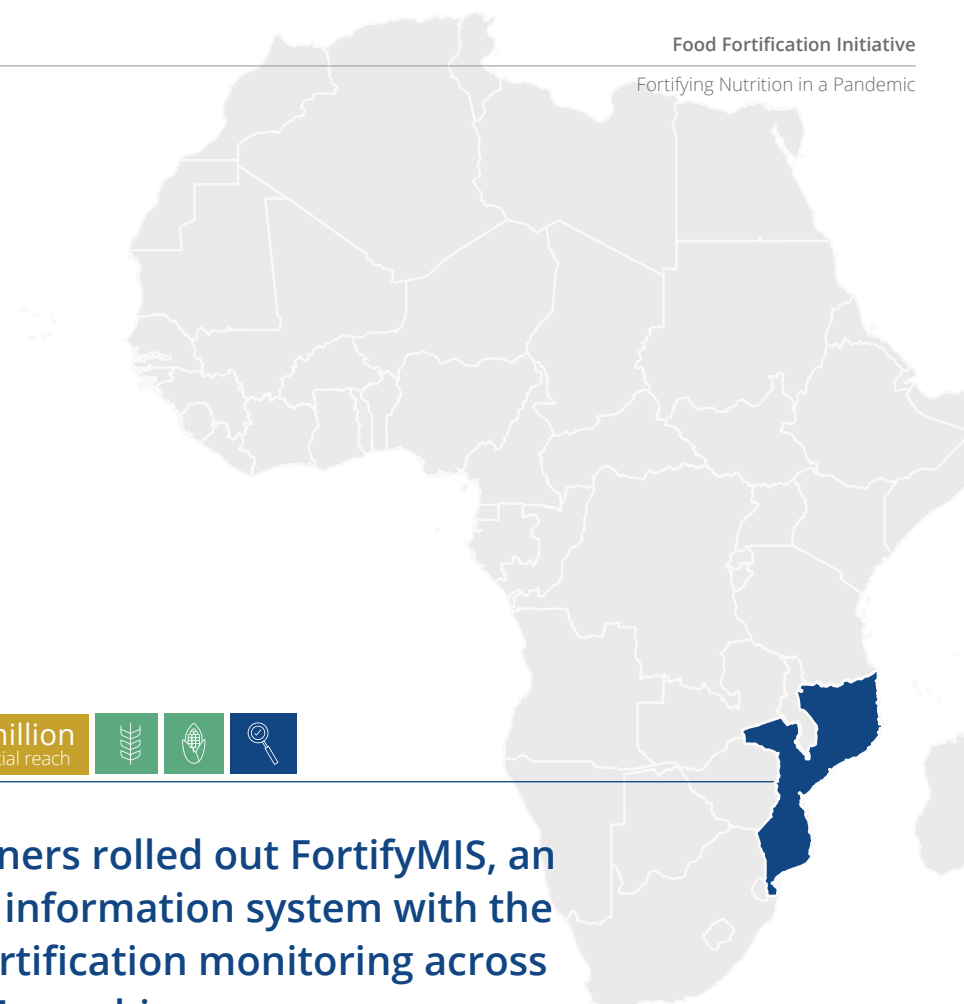
Like many things in 2020, the workshop was not without its challenges. The level of contribution from each team was limited due to the virtual nature of the meeting, and only six countries (Cameroon, Kenya, Nigeria, Senegal, Tanzania, and Uganda) were active contributors throughout the virtual meeting.

Yet, for those who attended, the workshop created a community of learning, kept participants engaged, and assisted country teams in working through specific monitoring

challenges. And teams from two countries, Senegal and Nigeria, left the meeting with a bit more. Senegal and Nigeria were selected as winners following a workshop-wide vote on the most effective and realistic solutions. Both countries will receive targeted technical assistance from FFI to operationalize the solutions they developed during the workshop.



Photo: Rod Waddington



MOZAMBIQUE

30 million potential reach



In 2020, FFI and partners rolled out FortifyMIS, an online management information system with the power to improve fortification monitoring across seven provinces in Mozambique.

The rollout, which was based on the success of a 2019 FFI and Global Alliance for Improved Nutrition (GAIN) pilot in Maputo province, included training for 88 individuals: private sector and external market producers, border inspectors, and production inspectors. Though the timing for scale-up coincided with the outbreak of the pandemic, the Government of Mozambique and FFI’s on-the-ground partners were committed—and ready—to ensure FortifyMIS could be used across the country, no matter what.

FortifyMIS provides decision makers with timely information to improve a national fortification program and,

consequently, the nutrition of the people who the fortification program reaches. Developed by Project Healthy Children (PHC) and GAIN, FortifyMIS is used on computers, tablets, and handheld mobile devices. It allows users to automatically track fortified food quality and safety data through customizable digital forms, real-time dashboards, and tailored data-reporting methods.

In addition to MIS support, FFI will continue to provide general technical assistance to the government throughout 2021 in order to improve their monitoring protocol activities.



SOUTH AFRICA 42.5 million potential reach



How do you collect information on millers' compliance to fortification standards and legislation without regulatory monitoring inspections?

The South Africa Department of Health and FFI may have found the answer in an existing data collection system: the South African Grain Information Service (SAGIS).

In South Africa, food safety inspectors, known as Environmental Health Officers, regulate a wide array of foods and industries. Additionally, these inspectors do not have a mandate to assess fortification compliance due to the country's decentralized governmental structure. The national government can "request," not "instruct," provinces to conduct an inspection and provinces can "request," not "instruct," municipalities to do the same.¹

Given these challenges, the Department of Health began to explore an alternative means of collecting compliance information through an already-existing data collection system, SAGIS. SAGIS is a non-profit, independent data

collection system with the goal of gathering, processing, analyzing, and timely distribution of reliable agronomic information to key stakeholders. Millers in South Africa trust SAGIS and report production figures to the organization on a monthly basis. If SAGIS includes an additional data point, namely monthly premix usage, in their system, fortification compliance could be inferred using the premix reconciliation calculation without having to regularly deploy inspectors to each producer. Instead, the system would identify noncompliant mills that inspectors could visit to assist with practices and procedures. Discussions are ongoing with SAGIS regarding the collection of this additional data point to infer national compliance.²

- 1 Randal, P.; P Cubed, Johannesburg, South Africa. Personal communication, 16 November 2020.
- 2 de Hoop, M.; National Department of Health, Pretoria, South Africa. Personal communication, 20 July 2020.

ZIMBABWE

3.2 million potential reach



With FFI's support, the Zimbabwe Ministry of Health and Child Care and UNICEF-Zimbabwe moved forward with the revision of their fortification strategy,

including the hiring of staff to complete extensive in-country fortification interviews to inform the new strategy. The pandemic forced partners to cancel the initial kick-off meeting in March 2020. Yet efforts continued virtually, demonstrating commitment to strengthen the health of all Zimbabweans by strengthening the country's fortification strategy.

FFI is supporting Zimbabwe throughout the entire revision process with a particular focus on the monitoring and communication sections of the strategy. FFI is also financially supporting the hiring of a government-placed consultant who will be responsible for leading fortification efforts post-strategy writing.



Photo: RTI

ASIA-PACIFIC

BANGLADESH

121 million
potential reach

Timing means everything. In 2020, that couldn't have been truer.

From January to February 2020, FFI, in collaboration with Nutrition International (NI), undertook a scoping study to assess the opportunity for fortifying wheat flour in Bangladesh. Through the study, which would not have been possible after February 2020 as a result of COVID-19, FFI found that by 2022 approximately 78% of the wheat flour in Bangladesh will be industrially milled—and that large, modern mills will have the capacity to fortify this flour on a large scale.

Although rice is a staple cereal grain in Bangladesh for the population as a whole, it is not clear whether the rice milling industry is industrialized enough to support mandatory fortification. A landscape analysis of Bangladesh's rice milling industry will clarify the feasibility to fortify rice, and FFI has made plans to complete this analysis in 2021.

On the other hand, wheat flour demand is growing rapidly in Bangladesh, particularly in urban areas. Fortifying all industrially milled wheat flour through mandatory fortification is expected to primarily reach Bangladesh's 59 million individuals living in cities--37% of the country's population. Social safety net fortification of wheat flour is currently possible under two mechanisms, Open

Market Sales and Vulnerable Group Feeding, and provides an opportunity to reach Bangladesh's most vulnerable. Yet, as these social safety net programs only reach around 3% of Bangladesh's total population, mandatory fortification of industrially milled flour presents a tremendous opportunity.

With legislation and standards already in place for mandatory oil and salt fortification, and voluntary standards in place for wheat flour and rice, there is legislative precedence and demonstrated interest by the Government of Bangladesh. Mandatory fortification of wheat flour and rice would complement the existing oil and salt fortification by delivering different essential micronutrients.

Through a [final report](#), the study provided recommendations to the government and other relevant stakeholders for implementing fortification of wheat flour in the country. Though implementation is pending due to the pandemic, it is remarkable that FFI was able to complete the first steps to establishing a successful wheat flour and rice fortification program and to building a smarter, stronger, and healthier future

“Fortifying all industrially milled wheat flour and rice through mandatory fortification is expected to reach 121 million individuals--75% of the country's population.”



Photo: Bryon Lippincott

INDONESIA

264 million
potential reach

Wheat flour fortification has been mandatory in Indonesia since 2001. However, due to reports of difficulties procuring fortification premix during the COVID-19 pandemic, the Government of Indonesia suspended mandatory fortification from March 2020 to 31 December 2020.

Despite the suspension, millers in Indonesia remained committed to the health of Indonesians and, according to Bogasari, the largest milling company in Indonesia, most millers continued fortifying wheat flour.

However, to continue to maintain a level playing field among millers and encourage them to fortify, mandatory legislation needed to be reinstated. In collaboration with global fortification partners, FFI co-authored an editorial published in the [Jakarta Post](#), [Phnom Penh Post](#), and a blog on [Nutrition Connect](#). The editorial emphasized the importance of maintaining nutrition interventions like fortification during the pandemic. In response, the Ministry of Health requested that the Ministry of Industry maintain mandatory fortification. To support the request, FFI worked with Nutrition International (NI) and premix suppliers to provide the government with an estimate of the availability of wheat flour premix.

In the summer of 2020, FFI provided support to NI to develop an economic justification of wheat flour fortification in preparation for

a government meeting in August. When the meeting was delayed, NI organized an online forum for wheat flour fortification stakeholders in October.

The online forum successfully reassured the Government of Indonesia that any premix supply chain problems from the start of the pandemic had been resolved and, as a result, in January 2021, the Government re-instated mandatory fortification of wheat flour. Additionally, the Ministry of Industry revised wheat flour fortification regulations in February 2021 so that the use of a more bioavailable iron compound, ferrous fumarate, was mandatory.

Partnership is critical to FFI's work, and FFI's partnership with an implementing, on-the-ground partner like NI made all the difference to ensure that Indonesia's most vulnerable continue to receive the nutrients they need.

PHILIPPINES

105 million
potential reach

2020 was a year of physical distance, but not necessarily a year spent apart.

In fact, FFI found that COVID-19 challenges strengthened existing connections and inspired new partnerships. This became particularly true in the Philippines, where stalled advocacy efforts were reinvigorated with the help of a new partner--Effective Altruism (EA) Philippines.

Five years ago, FFI was able to successfully advocate for a resolution to add folic acid to the Philippines' existing wheat flour fortification standard. However, efforts stalled in 2019 when one of the resolution's review committees asked

for local stability studies of folic acid in wheat flour and products—even though stability studies already exist and evaluations post-fortification with folic acid have demonstrated reductions in neural tube defects, indicating that folic acid is retained in the food to cause a health impact.

In an effort to restart the advocacy conversation, FFI has invited members from EA Philippines to advocate for folic acid through social media and news outlets, blogs and petitions, and letters to government leadership. Though there are no changes in the national standards yet, FFI and the EA volunteers are hopeful that their voices will gain traction.

Founded by a group of Filipinos passionate about making large-scale social impact, EA Philippines is a chapter of the global Effective Altruism movement. The movement uses evidence and reasoning to identify the most effective ways to benefit others. Fortification of staple foods is championed by the EA movement as an effective, large-scale intervention to improve the nutrition of populations at relatively little cost.



Photo: Simone D. McCourtie/World Bank



Photo: Bart Verweij/World Bank

SOLOMON ISLANDS

611,000
potential reach

As COVID-19 pressed pause on fortification activities in the region, the Solomon Islands maintained implementation and monitoring of its new rice fortification standard,

which had become effective August 2019, due to plans put in place during FFI's support 2015-2020.

In the early days of the pandemic, the Solomon Islands considered suspending rice fortification due to a temporary Vietnamese ban on rice exports that came into effect in March

2020. And in April and May 2020, Viet Nam introduced rice export maximums to protect its national rice supply.

Much of the fortified rice that the Solomon Islands imports is blended in Viet Nam, and supply chains to fortify rice in alternate exporting countries had not yet been established. However,

because the Solomon Islands had stockpiled fortified rice, the country was able to maintain national supply without suspending the fortification mandate until Viet Nam resumed regular exports in May.

Most impressively, border control agencies in the Solomon Islands successfully maintained the import monitoring protocol for rice fortification throughout the pandemic, which ensured that all imported rice was fortified. In coordination with Customs and Biosecurity, the Environmental Health Unit of the Ministry of Health and Medical Services (MHMS) implemented a compliance and enforcement framework for importing fortified rice that was developed in partnership with FFI. The framework requires each shipment of rice to provide certificates of compliance and testing.

According to MHMS quarterly reports, certificate checks and spot testing at ports show over 100% compliance. With these impressive findings, MHMS has committed

long-term inspection resources to oversee fortification compliance and to continue building a healthier future for Solomon Islanders.



Photo: Becky Tsang/FFI

“Agencies in the Solomon Islands successfully maintained the import monitoring protocol for rice fortification throughout the pandemic, which ensured that *all* imported rice was fortified.”



Photo: Kalpak Travel



When the pandemic made an in-person mill assessment in Tajikistan impossible, FFI took a virtual approach.

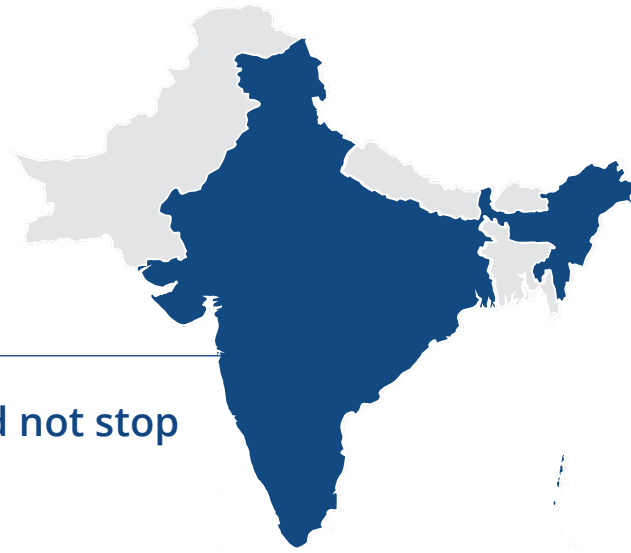
In July 2019, legislation mandating that wheat flour be fortified came into effect across Tajikistan. Yet evidence in late 2019 showed that compliance with the legislation was low. In order to ensure compliance and that Tajikistanis would receive critical nutrients through fortification, FFI and UNICEF had planned to conduct a mill assessment in April 2020.

Instead, FFI conducted a robust review—from a desk—of Tajikistan's wheat flour supply chain. Through the review, FFI identified 18 large- and

medium- scale wheat flour mills that control nearly 90% of the country's milling production. An assessment of the readiness of these mills to fortify, as well as a gap analysis, are ongoing.

The review is a critical step to help the Tajikistan Government, FFI, and UNICEF better understand what support wheat flour millers need to comply with the new legislation and to inform a future in-person mill assessment. Though there is no replacement for on-the-ground fieldwork, FFI's efforts kept progress in motion toward a brighter future.

INDIA



INDIA

125.5 million
potential reach



In Haryana state, India, COVID-19 did not stop millers from fortifying.

Out of all Indian states, Haryana has one of the highest percentages of In fact, the demand for—and supply of—fortified flour increased thanks to FFI and the Haryana Government's hard work to expand access.

By the end of 2020, Haryana successfully scaled up the distribution of fortified atta, a whole meal wheat flour used to make flatbreads such as chapati, to the entire state—a total of 22 districts—through the Mid-Day Meal program (MDM) and Integrated Child Development Services (ICDS). Additionally, FFI empaneled more than 50 millers across Haryana, ensuring that the supply for fortified atta could meet demand.

Though Haryana made significant progress in 2020, it was not easy. During COVID-19 restrictions, many mill workers returned to their home states and

production slowed, causing a slight delay in the distribution of fortified atta. For some millers, the price of premix and packaging material increased as a result of increased demand and limited premix production. Additionally, during India's country-wide lockdown, FFI was unable to make in-person monitoring visits to mills. Instead, the FFI India team turned to their telephones to connect with millers, collect data, provide technical assistance, and help engineer solutions to COVID-19 challenges.

With lockdowns lifted and the success of Haryana's MDM and ICDS, the FFI team will focus their efforts in 2021 to scale up distribution of fortified atta through the Public Distribution System from five to 22 districts, a goal that will ultimately ensure 12.6 million people have access to essential micronutrients like iron and folic acid.





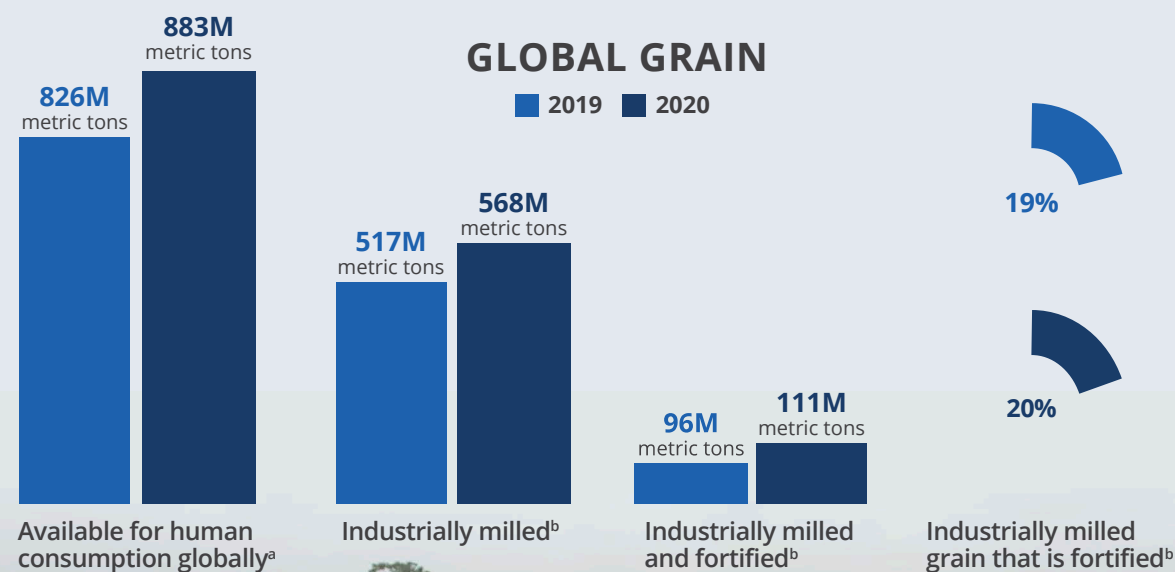
The 2020 increase in industrially milled grain available for human consumption globally presents a tremendous opportunity for fortification.

In parts of Africa, Asia, and India, the overall availability and consumption of cereal based grains increased exponentially. As more grain is industrially milled and consumed, more grain can be fortified with essential micronutrients to save more lives.

The dramatic increase in grain available for human consumption and amount that is industrially milled also reflects a recent update of FAO data. For 2020 estimates, FFI

used newly updated FAO data collected in 2018. For 2019 estimates, FFI used the latest data available for all countries, which was collected in 2013.

Despite these increases, the percentage of industrially milled grain that is fortified has been slow to grow. This indicates that there is a pressing need for FFI's support to better plan, implement, and monitor the fortification of industrially milled grain around the world.



How we calculate global estimates

We measure global progress in grain fortification through an annual survey.

We begin with data from the Food and Agriculture Organization (FAO) of the UN about how much grain is available in the food supply for each country.

Flour and rice available

To calculate the amount of wheat flour available, we multiply the metric tons of wheat available in each country by the country's average flour extraction rate. We use 75% as the default extraction rate unless we have country-specific data.

reflect industrial production. We assume that 100% of wheat flour is industrially milled, with the exception of countries with a large number of small mills, such as Afghanistan, India, Nepal, and Pakistan. In contrast, we assume that 0% of maize flour and rice are industrially milled unless we have country-specific data to indicate otherwise. The exception is that in countries in FFI's Europe region, we assume that 100% of the maize flour and rice is industrially milled.

Percent fortified

For maize flour, we use regional extraction rates of 67.5% for Africa and 72.5% for South/Central America and the Caribbean. We use an extraction rate of 70% elsewhere for maize.

We ask national partners in governments, milling associations, nongovernmental organizations, and UN agencies to estimate how much of each grain is fortified in their country. We then compile the country figures into global estimates.

No extraction rate adjustment is needed for rice as FAO data represents the "milled rice equivalent."

Industrially milled

We then adjust the numbers to

^a 2019 estimates: 2013 FAOSTAT, Old Food Balances, Food (element 5142); <http://www.fao.org/faostat/en/#data/FBSH>

2020 estimates: 2018 FAOSTAT, New Food Balances, Food (element 5142) 2018 Data; <http://www.fao.org/faostat/en/#data/FBS>

^b FFI calculations.



Photo: RTI

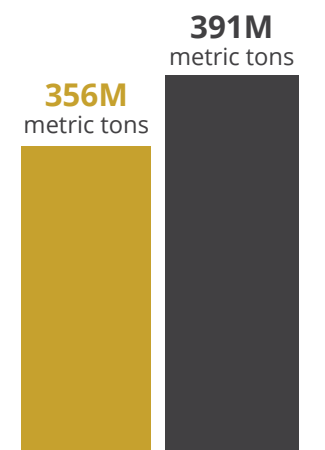
 **Wheat**

FAO data cited in FFI's 2020 estimates shows a growth over five years of 35 million metric tons of wheat available for human consumption. The corresponding increase in the industrially milled grain was 23 million metric tons. Assuming that wheat is consumed at 250grams/person/day on average across the globe, FFI estimates that this growth presents an opportunity to reach

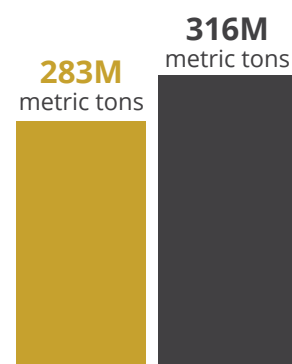
an additional 252 million people with fortified, industrially milled wheat flour. The growth is concentrated in Africa and Asia, which are key geographies which FFI targets. The increases are staggering in these regions, with the increase in wheat consumption in many countries ranging from 20% to 90%.

WHEAT FLOUR

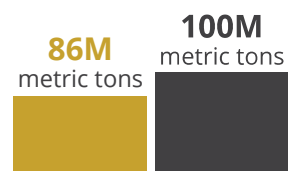
■ 2019 ■ 2020



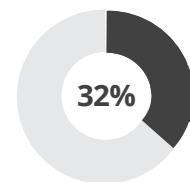
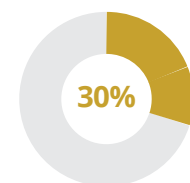
Available for human consumption globally^a



Industrially milled^b

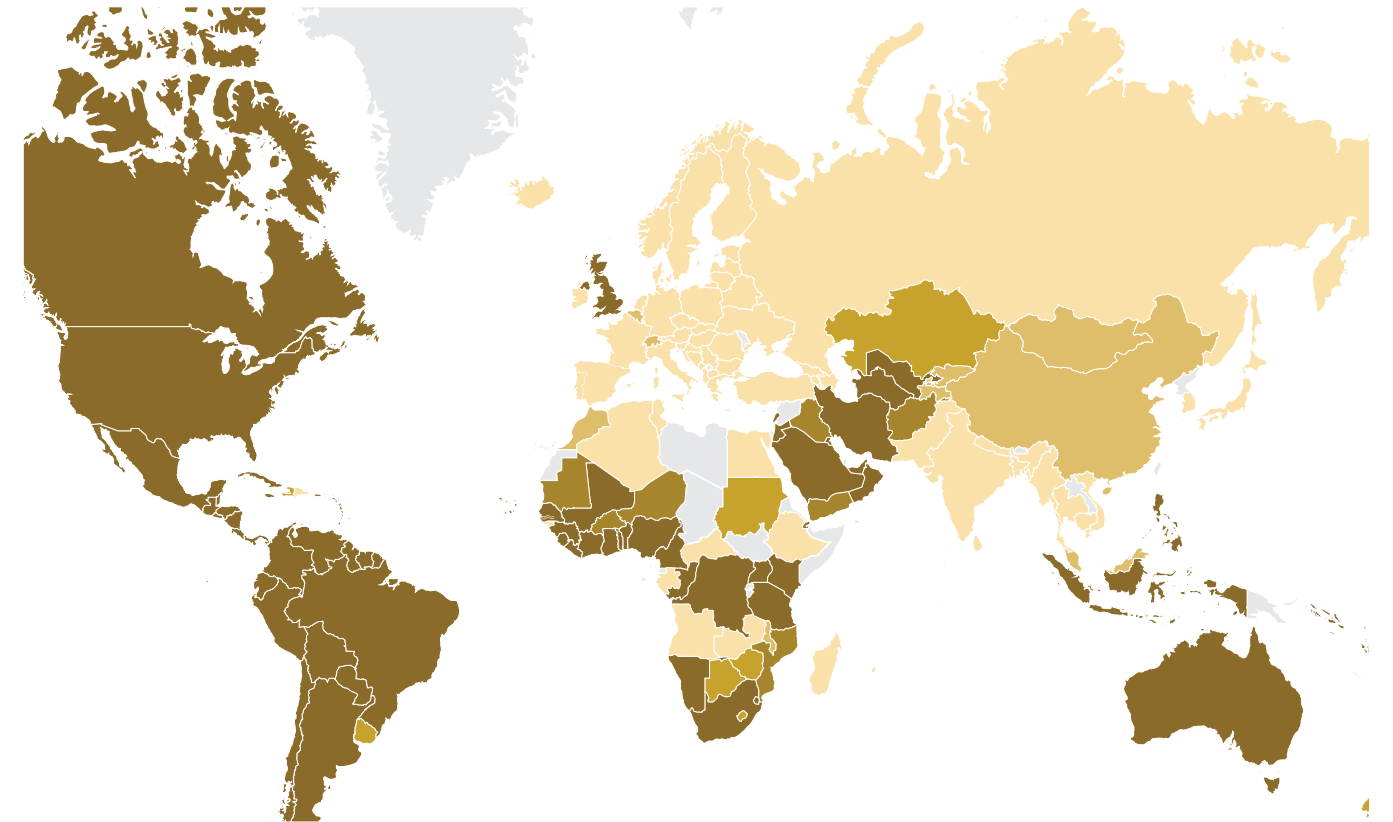


Industrially milled and fortified^b








Industrially milled grain that is fortified^b

Percentage of industrially milled wheat that is fortified, 2020



LEGEND

-  75-100%
-  50-74%
-  25-49%
-  1-24%
-  0-<1%

Countries have one of the following:

- Less than 75 grams per capita per day available for human consumption
- Less than 30% of industrial milling capacity
- No data

^a 2019 estimates: 2013 FAOSTAT, Old Food Balances, Food (element 5142); <http://www.fao.org/faostat/en/#data/FBSH>

2020 estimates: 2018 FAOSTAT, New Food Balances, Food (element 5142) 2018 Data: <http://www.fao.org/faostat/en/#data/FBSH>

^b FFI calculations.

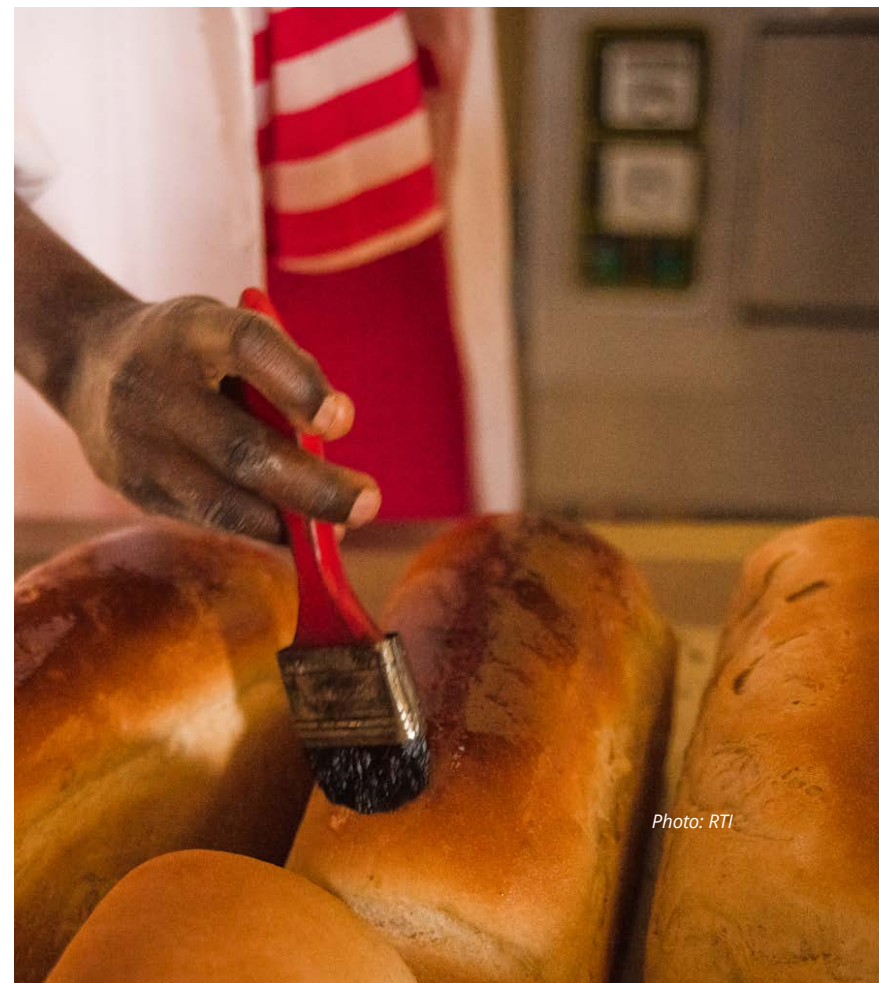


Photo: RTI



Photo: Maize is ready to harvest in Niassene, Kaolack region, Senegal. Xaume Olleros/RTI

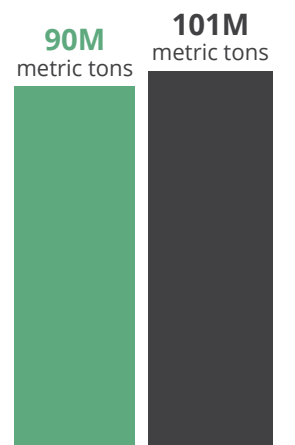
 **Maize**

FFI's global estimate of the reach of fortified maize flour increased from 30% in 2019 to 34% in 2020. To further refine FFI's method for reporting future maize flour fortification opportunities, FFI plans to specifically report the availability, percentage that is industrially milled, and percentage of industrially milled maize that is fortified in targeted countries only. In many countries, maize is industrially

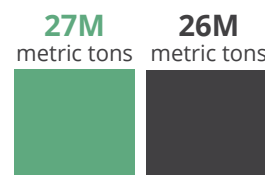
milled but consumed less than another grain, suggesting that maize is not a priority for large-scale fortification. By limiting the scope, FFI can highlight countries where maize is a staple food, consumed more than wheat or rice, and can be fortified. In many countries, maize is industrially milled yet consumed less than another grain, suggesting that maize is not a priority for large-scale fortification.

MAIZE FLOUR

■ 2019 ■ 2020



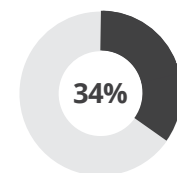
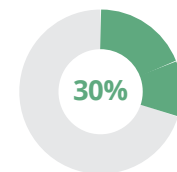
Available for human consumption globally^a



Industrially milled^b

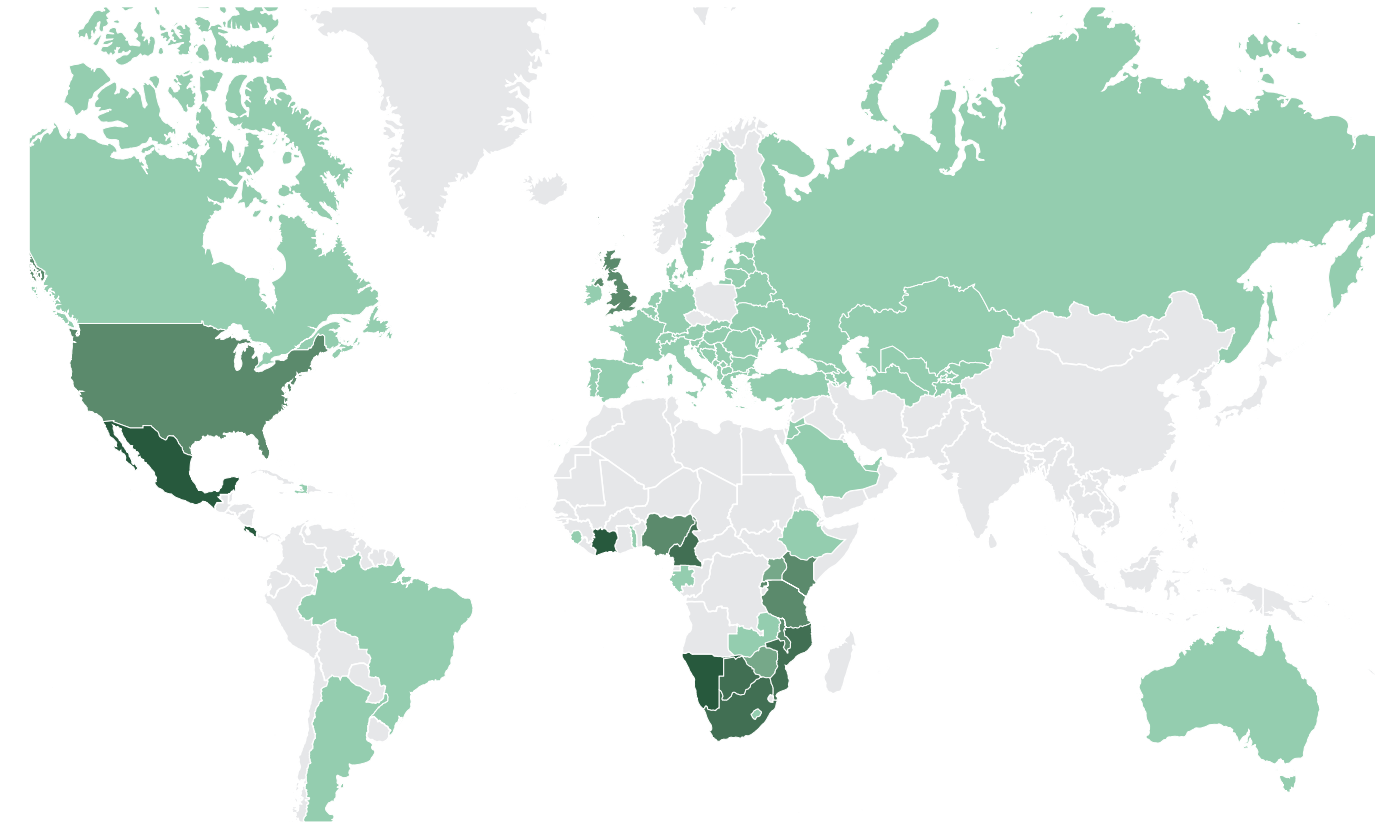


Industrially milled and fortified^b



Industrially milled grain that is fortified^b

Percentage of industrially milled maize that is fortified, 2020



LEGEND

- 75-100%
- 50-74%
- 25-49%
- 1-24%
- 0-<1%

Countries have one of the following:

- Less than 75 grams per capita per day available for human consumption
- Less than 30% of industrial milling capacity
- No data

^a 2019 estimates: 2013 FAOSTAT, Old Food Balances, Food (element 5142): <http://www.fao.org/faostat/en/#data/FBSH>

2020 estimates: 2018 FAOSTAT, New Food Balances, Food (element 5142) 2018 Data: <http://www.fao.org/faostat/en/#data/FBS>

^b FFI calculations.



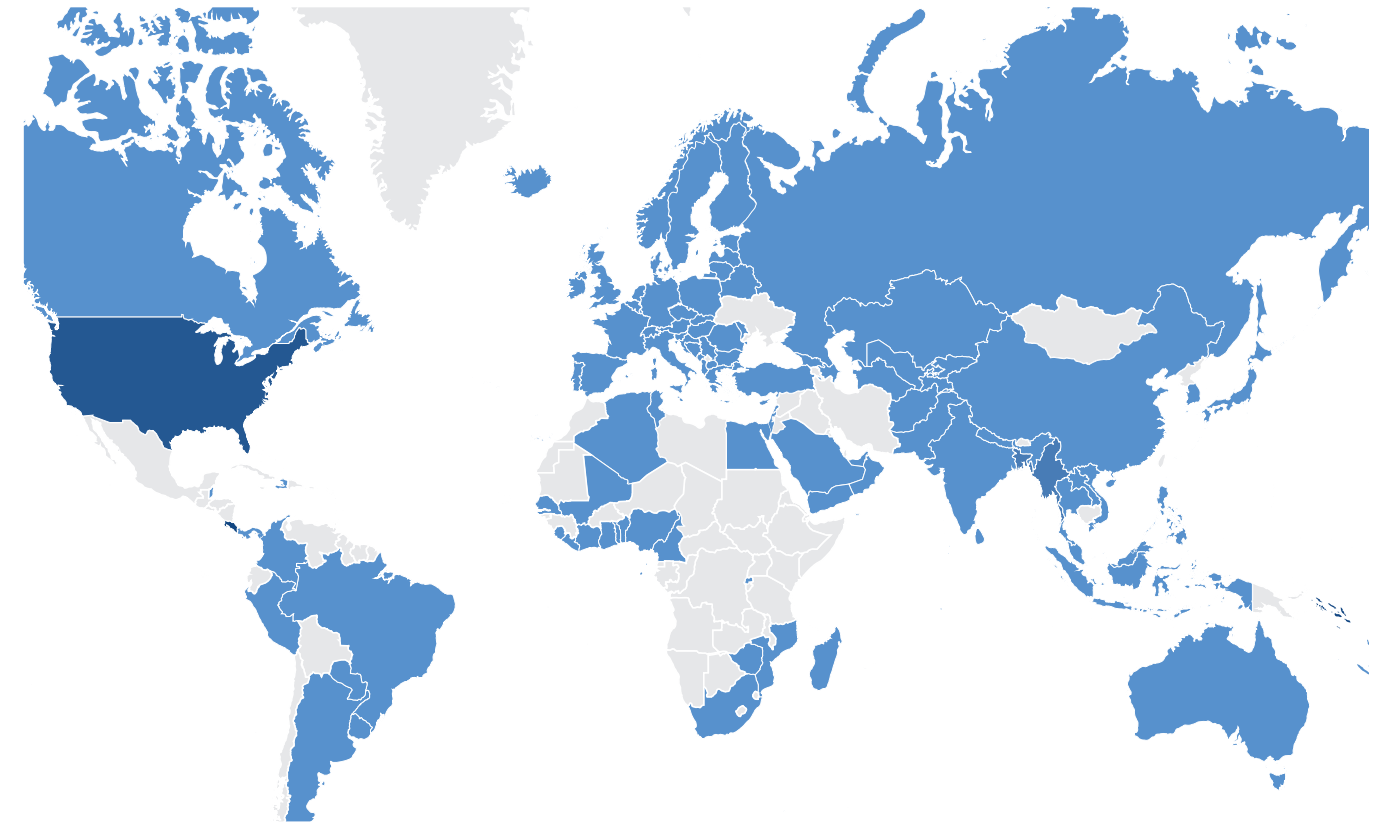
Photo: Xaume Olleros/RTI



Photo: Tran Thi Hoa / World Bank



Percentage of industrially milled rice that is fortified, 2020



Though the 2020 estimate of industrially milled rice that is fortified remained constant at 1%, the volume of fortified rice available for consumption globally increased by 1 million tons. FFI's work with partners in Southeast Asia and West Africa to scale up rice fortification

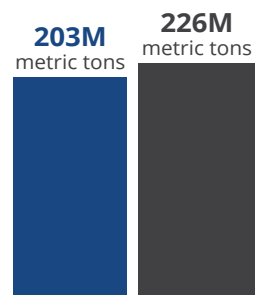
has been, and continues to be, critical to laying the foundation for progress. Rice fortification presents an opportunity to reach hundreds of millions of people in parts of the world where rice is the most commonly consumed grain.

RICE

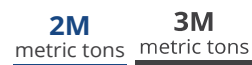
■ 2019 ■ 2020



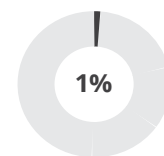
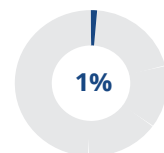
Available for human consumption globally^a



Industrially milled^b

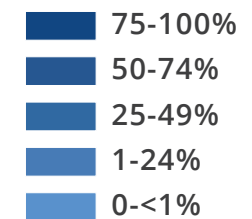


Industrially milled and fortified^b



Industrially milled grain that is fortified^b

LEGEND



Countries have one of the following:

- Less than 75 grams per capita per day available for human consumption
- Less than 30% of industrial milling capacity
- No data

^a FAO data with additional sources for Papua New Guinea. 2019 estimates: 2013 FAOSTAT, Old Food Balances, Food (element 5142): <http://www.fao.org/faostat/en/#data/FBSH>

2020 estimates: 2018 FAOSTAT, New Food Balances, Food (element 5142) 2018 Data: <http://www.fao.org/faostat/en/#data/FBS>

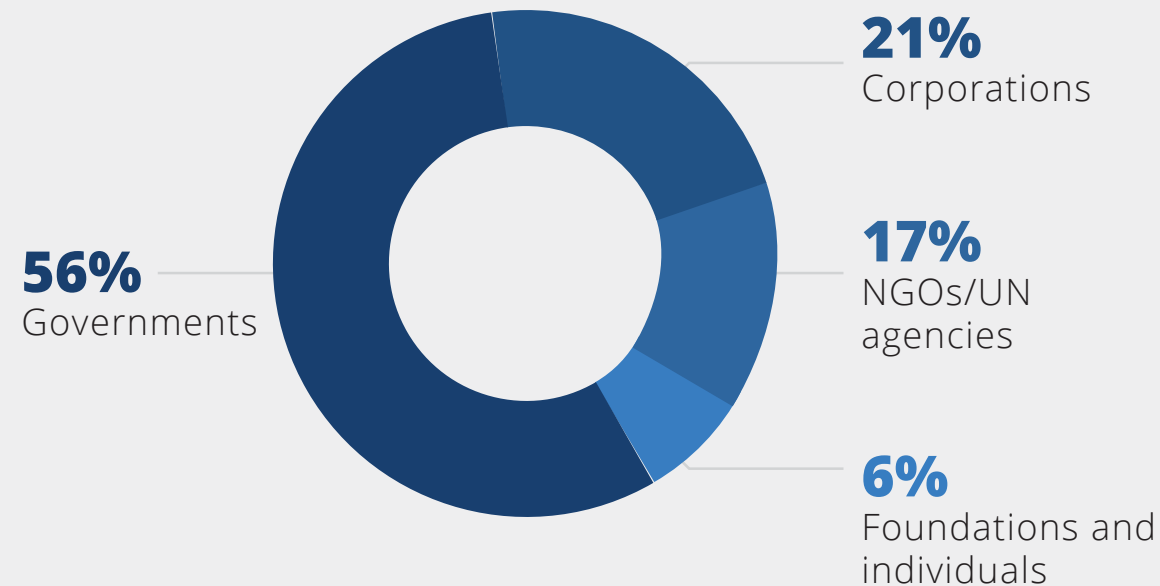
^b FFI calculations.



Photo: Xaume Olleros/RTI

Gift Profile

We are grateful to the individuals and donors who contributed to our work in 2020. Contributions for 2020 were US \$1.7 million.



How to contribute

Your gift will make a difference by reducing the debilitating effects of anemia, preventing thousands of serious birth defects a year, and strengthening immune systems to prevent premature death in children and adults alike. Join us and [donate to FFI](#).



Photo: Working a rice field. Xaume Olleros/RTI

Executive Management Team

An Executive Management Team (EMT) representing global leaders in the public, private, and civic sectors provides FFI's strategic direction.

Jane E. Friedrich

Leader, Global Core Research and Development
Cargill, Inc.

Reynaldo Martorell

Woodruff Professor of International Nutrition; Senior Advisor, Global Health Institute
Emory University

Penjani Mkambula

Lead, Food Fortification
Global Alliance for Improved Nutrition

Melinda Farris

Executive Vice President
International Association of Operative Millers

Sylvia Roozen

Secretary General
International Federation for Spina Bifida and Hydrocephalus (IF)

Manpreet Chadha

Senior Technical Adviser, Fortification
Nutrition International

Vilma Tyler

Senior Advisor, Nutrition - School Age Children, Adolescents, and Women
United Nations Children's Fund (UNICEF)

In addition to the seven members listed above, leaders from the CDC and WHO are EMT observers, including:

Luz María De-Regil

Unit Head, Multisectoral Action in Food Systems
World Health Organization

Ruth Petersen

Director, Division of Nutrition, Physical Activity, and Obesity - National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention

New Member Spotlight

In 2020, the FFI EMT welcomed three new members: Jane Friedrich, Sylvia Roozen, and Vilma Tyler.

Jane Friedrich

Leader, Global Core Research and Development, Cargill, Inc.

Jane Friedrich was nominated as FFI EMT Chair after joining the EMT in March 2020. An innovator, Friedrich has held a variety of positions in Cargill Research and Development (R&D) since 2000. She currently leads Global Core R&D, Cargill's shared research focused team in the areas of Food Safety Research, Biotechnology, Nutrition, Ingredient Chemistry, Chemical Characterization and Material Science. This team focuses on scientific research, while partnering closely with Cargill businesses to turn science into business results. Prior to this role she was the Group R&D Leader for Global Protein in APAC, EMEA, and LATAM where she was responsible for driving growth through an insights-based innovation approach across all channel segments.



Jane received her Bachelor's degree in Chemistry from the University of St. Thomas and received her MS and PhD degrees in Food Science with concentrations in Food Chemistry and Flavor Chemistry respectively from Cornell University.

Sylvia Roozen
Secretary General, IF

As IF Secretary General, Sylvia Roozen brings extensive experience in the non-profit sector working to prevent disabilities and to develop organizational strategies. Before joining IF in early 2020, Roozen obtained her PhD at the Governor Kremers Centre-Maastricht University Medical Centre in the Netherlands. During her PhD, she led an international agenda on the prevention of Fetal Alcohol Spectrum Disorders. She also worked as a consultant for various ministries, state agencies, NGOs, health services, and healthcare professionals to collaboratively develop strategies for prevention of preventable forms of disabilities.



Together with IF's members, board members and IF's Secretariat, Roozen is dedicated to building positive futures for people with spina bifida and hydrocephalus, and to reduce the prevalence of neural tube defects and hydrocephalus by primary prevention through improving maternal health literacy, raising awareness, political advocacy, research, community building, and human rights education.

Vilma Tyler

Senior Advisor, Nutrition - School Age Children, Adolescents, and Women, UNICEF

Vilma Tyler is no stranger to FFI. Though she now serves on FFI's EMT as the Senior Nutrition Adviser at UNICEF headquarters in New York City, Vilma once worked at FFI as a Program Coordinator.

Tyler has over 25 years of experience in public health and nutrition, living and working around the world. Prior to joining UNICEF headquarters, Tyler served as Nutrition Advisor for the Middle East and North Africa regional office where she supported 20 countries in developing and scaling up nutrition programs. Tyler has worked in several other positions at UNICEF, including as Chief of Nutrition for UNICEF in Juba, South Sudan, where she led the emergency nutrition response while continuing to focus on integrating nutrition into health systems. She also worked as Regional Nutrition Advisor for UNICEF Eastern Europe and Central Asia regional office where she supported 22 countries in establishing a nutrition program with special emphasis on prevention and strengthening food systems.



"THE NEED FOR
FORTIFICATION IS
GREAT, BUT ITS
POTENTIAL TO
DRAMATICALLY
IMPROVE
NUTRITION IS
EVEN GREATER."



Food Fortification Initiative
Enhancing Grains for Healthier Lives

Photo: Dominic Chavez/World Bank