

October 2018



Improving Nutrition in East Africa's Bread Basket

U.S. Government Nutrition Investments in Uganda

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Cathryn Streifel

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Center for Strategic and International Studies
1616 Rhode Island Avenue NW, Washington, DC 20036
202-887-0200 | www.csis.org

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Executive Summary

Improving nutrition is among the most transformative and cost-effective interventions in global health and food security. Nutrition investments, particularly in the 1,000-day window from pregnancy to a child's second birthday, can prevent the lifelong consequences of childhood malnutrition and enable children to grow into healthy, educated, productive adults. Beyond their direct health benefits, efforts to advance nutrition contribute to the success of investments in other sectors and fuel progress toward all 17 Sustainable Development Goals.² Every dollar invested in nutrition yields up to \$35 in economic returns.³

As the single largest donor to global nutrition efforts, the United States plays an important role in helping countries improve the health and nutrition status of their populations.⁴ Uganda is a focus for major presidential and other U.S. development assistance initiatives—including the President's Emergency Plan for AIDS Relief (PEPFAR), the President's Malaria Initiative, the Feed the Future Initiative, and Food for Peace. As a U.S. Agency for International Development (USAID) priority country for maternal and child health and nutrition, Uganda offers a lens through which to assess some global opportunities and challenges in advancing nutrition. While Uganda has made steady progress in improving food and nutrition security over the last three decades, progress has been slow and malnutrition levels remain alarming. The country also faces a number of threats to its stability, including rapid population growth and an unsustainable dependence on donor financing to support basic government health spending.

To understand lessons from the country's recent experience, a research team from the CSIS Global Health Policy Center and the CSIS Global Food Security Project visited Uganda in April 2018.

Over the course of a week in Kampala and the southwestern region, CSIS conducted site visits and held meetings with representatives of national and district public health and related agencies, U.S. government representatives, and U.S.-supported partner organizations—including in the private sector and civil society.

This report examines U.S. support for nutrition in Uganda and lays out six broad policy options for U.S. policymakers to consider:

- While continuing to accelerate support for strategically integrating nutrition with other primary care services, ensure that the focus on nutrition is not diluted by integration.
- Prioritize the collection of nutrition data and its use in decisionmaking, particularly at the district level.
- Increase knowledge of and demand for improved nutrition at the community level by building on foundational investments.
- Elevate the focus on adolescent girls and young women.
- Continue to support the government of Uganda's efforts to pass the Biotechnology and Biosafety Act into law.
- Further strengthen the bilateral dialogue about long-term planning and mobilizing domestic resources to reach nutrition goals.

Uganda's Nutrition Sector

"With close to 60% of the population below 18 years of age, and over 75% below the age of 35 years, our children's cognitive development represents Uganda's greatest natural resource. Moreover, Uganda's vision to become a middle-income country by 2040 remains highly contingent upon our collective ability to safeguard children's right to contribute to national development."

WILSON MURUULI MUKASA

(former) Minister of Gender, Labour, and Social Development, in the foreword to UNICEF's 2015 Situation Analysis of Children in Uganda⁵

"Many Ugandans, especially children and women of reproductive age, are deficient in micronutrients, including vitamin A, iron, zinc, iodine, and folate. As a consequence, millions of Ugandans are prevented from realizing their full potential as students, workers, parents, and citizens."

DR. JANE RUTH ACENG

Minister of Health, in the foreword to Uganda's 2017 National Industrial Food Fortification Strategy⁶

Country Overview

Yoweri Museveni has served as President of Uganda since the end of the civil war in 1986. Under his leadership, Uganda has enjoyed relative political stability and economic growth.

In the 1990s and 2000s, Uganda's GDP grew an average of 7 percent per year and its national poverty rate dropped significantly. However, its economic growth has recently decelerated, reversing the country's poverty reduction trends.⁷ The national poverty rate, which had declined from 56 percent to 20 percent between 1992 and 2013,⁸ has since rebounded to 33 percent.⁹

Agriculture is among the most important sectors of the Ugandan economy: it accounts for 24 percent of GDP and contributes half of all export earnings. For the majority of Ugandans, agriculture is the primary source of income and thus the main pathway out of poverty. The World Bank attributes 79 percent of national poverty reduction during 2006–2013 to the income growth of agricultural households.¹⁰ It is, however, a fragile pathway out of poverty; for every three Ugandans who manage to escape poverty, two will fall back into it.¹¹

Uganda's population is growing at a rate of 3.3 percent per year and is projected to almost double

Uganda Key Data

National poverty rate: 33.1%	Total fertility rate: 5.4 children per woman
Population growth rate per year: 3.3%	Unmet need for family planning (currently married women): 28%
Rural population: 83%	Unmet need for family planning (unmarried sexually active women): 32%
Population minimally food insecure: 86%	Adolescent girls and young women (aged 15–19) who are mothers or currently pregnant: 24.1%
Population that is stressed: 13%	Lifetime physical and/or sexual intimate partner violence: 50%
Stunting in children under five: 29%	Under-five mortality rate: 64 deaths per 1,000 live births
Exclusive breastfeeding of children under six months: 66%	Maternal mortality ratio: 336 deaths per 100,000 live births
Minimum acceptable diet in children 6–23 months: 15%	Health workers per 1,000 people: 1.55
Anemia in children under five: 53%	Health expenditure per capita: \$22
Anemia in women: 32%	13-to-18-year-olds out of school (female): 30%
Anemia in men: 16%	13-to-18-year-olds out of school (male): 21%
Access to basic sanitation (urban): 86%	Population not associated with a religion: 0.2%
Access to basic sanitation (rural): 80%	
HIV prevalence rate (female): 7.3%	
HIV prevalence rate (male): 4.5%	

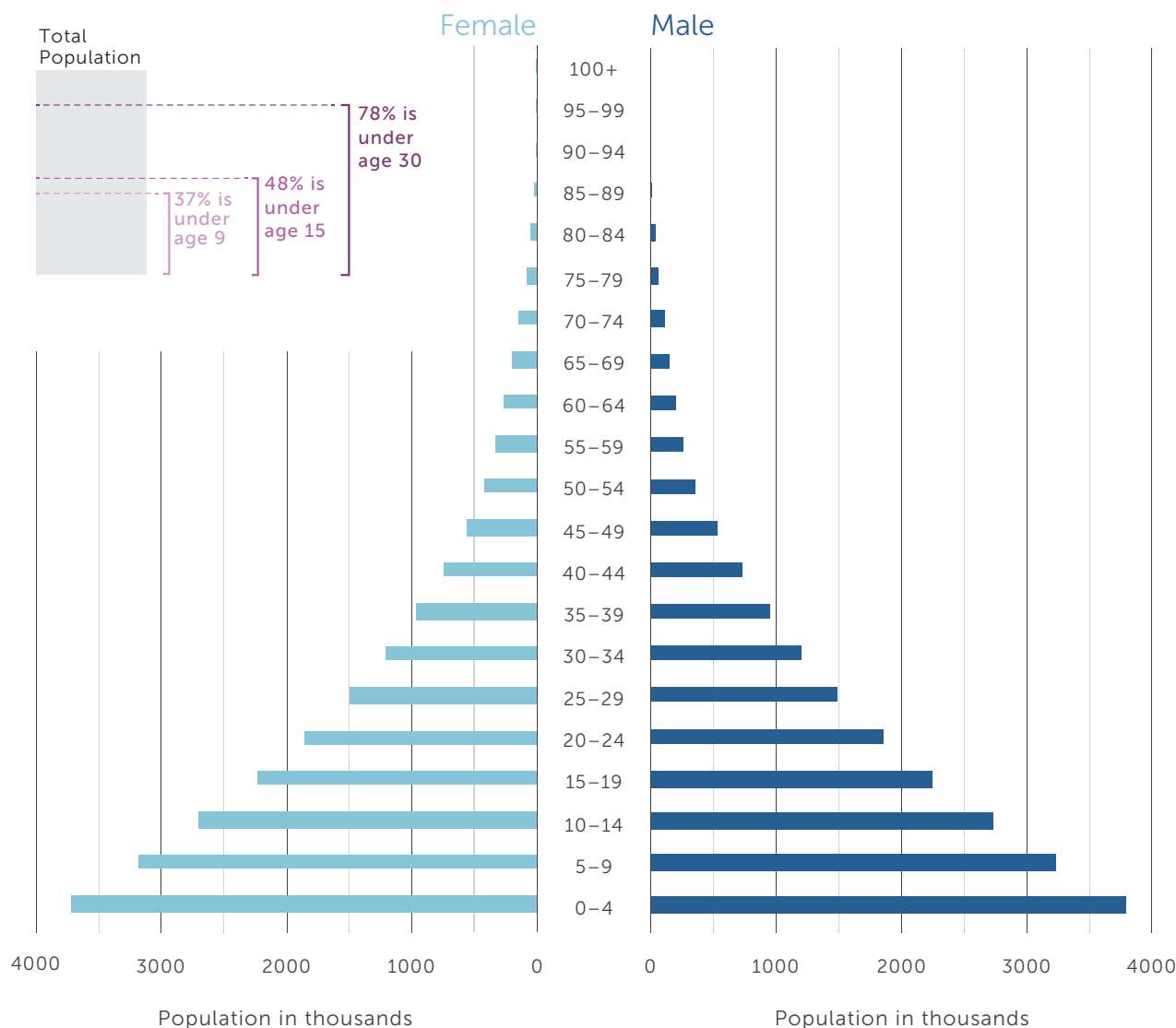
“The national poverty rate, which had declined from 56 percent to 20 percent between 1992 and 2013, has since rebounded to 33 percent.”

to nearly 80 million by 2040. At 5.4 children per woman, its total fertility rate is the eighth highest in the world. Uganda is the only country with a population of its size that continues to grow at this sustained rate.¹²

Uganda is also experiencing one of the fastest growing refugee crises. With a total refugee population of more than 1.34 million, it currently hosts the largest number of refugees in Africa and the third-largest count in the world.¹³

Since 2005, the Government of Uganda has been decentralizing its public sector and transferring power from the national to the district level. In 2015, its parliament established 23 additional districts to be phased in by 2019, bringing their total number to 126.

Uganda's Population Pyramid



United Nations, Department of Economic and Social Affairs, Population Division,
"World Population Prospects: The 2017 Revision", 2017.

Nutrition Governance

Responsibility for improving nutrition in Uganda is divided between national, district, and local levels. At the national level, the Ministry of Health and the Ministry of Agriculture, Animal Industries, and Fisheries (MAAIF) are responsible for setting standards and developing policies on nutrition and food security in Uganda. The Nutrition Secretariat within the Office of the Prime Minister is responsible for overseeing and coordinating all nutrition activities from the national to the local level, but, with just two or three full-time staff, it lacks the necessary human and other resources to carry out its mandate effectively. The

Office of the Prime Minister is also the convening body for the Scaling Up Nutrition (SUN) movement.¹⁴

Service delivery takes place at the district level, where district councils approve a locally tailored action plan for nutrition, which is then implemented by District Nutrition Coordination Committees (DNCCs). The Ministry of Finance, Planning, and Economic Development (MOFPED), which appropriates district-level budgets based on a standard formula across the country, does not allot nutrition its own line item or require districts to report nutrition indicators. The prioritization of nutrition at the district level varies depending on local leadership.

Government of Uganda	Role on Nutrition
National Level	
Office of the Prime Minister	A Nutrition Secretariat sits within the Office of the Prime Minister and is mandated to coordinate Uganda's multisectoral nutrition activities and policies. The Nutrition Secretariat also monitors and supports the supervision of the country's District Nutrition Coordination Committees.
Ministry of Health	The Ministry of Health sets standards and develops policies to ensure quality nutrition services are provided. Within the Ministry's Community Health Department, a Nutrition Division supports the implementation, monitoring, and evaluation of nutrition programs and coordinates all stakeholders and nutrition activities through the Nutrition Cluster.
Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF)	The MAAIF manages the country's agriculture sector, with primary objectives to increase rural incomes and livelihoods and improve household food and nutrition security. Along with the Ministry of Health, the MAAIF sets standards and develops policies to safeguard the provision of quality food and nutrition services.
Ministry of Finance, Planning, and Economic Development (MOFPED)	The MOFPED prepares the annual national budget and midterm expenditure allocations, funding crop production, fish production, and nutrition-related programming. The MOFPED also develops and monitors policies and strategies to guide annual and medium-term expenditure.
National Planning Authority	The National Planning Authority provides guidance for decentralized planning processes, and accordingly, created the National Nutrition Planning Guidelines for Uganda to help integrate nutrition across sector and local government plans.
Ministry of Local Government	The Ministry of Local Government offers administrative support, technical advice, and mentoring to effectively execute local government development plan processes, which may contain nutrition-related goals and programs.
Bureau of Statistics	The Uganda Bureau of Statistics implemented the 2016 Uganda Demographic Health Survey, which collected country-wide anthropometric indicators to assess the nutritional status of children and adults.
Ministry of Trade, Industry and Cooperatives (MTIC)	The MTIC leads industry compliance, standards development, and harmonization of fortified foods with the East African community.
National Bureau of Standards	The National Bureau of Standards sits within the MTIC and is responsible for labeling oversight and market surveillance. It issues standards for fortified food products and tests products against them.
Ministry of Gender, Labour, and Social Development (MGLSD)	The MGLSD promotes gender equality, equity, human rights, and empowerment for vulnerable groups—including women, children, adolescent mothers, unemployed youth, internally displaced people, the elderly, and persons with disabilities—through advocacy, education, analysis, and monitoring of their nutrition and food security needs.

Ministry of Water and Environment	The Ministry of Water and Environment conducts legal and policy reviews on existing food security, water, and nutrition policies, and provides policy recommendations. The Ministry produced the Water and Environment Sector Development Plan, which includes improved nutrition and food security as priorities in the country's water, sanitation, and hygiene programs.
Ministry of Education and Sports (MOES)	The MOES is responsible for providing Ugandans with high quality education at the lowest affordable cost. Uganda's education system is structured to equip students with basic knowledge and skills so that they may lead lives in good health and nutrition.
District Level	
District Nutrition Coordination Committees	DNCCs include representatives from key sector departments, the private sector, and civil society organizations. DNCCs monitor and evaluate nutrition activities and provide technical advice to district technical planning committees, district councils, and lower-level government.
Chief Administrative Officers	Chief administrative officers are appointed by the central government with responsibility for the technical administration of districts. They supervise the heads of various district departments, including health, agriculture, and education, as well as the key informants to the DNCCs. They are responsible for convening DNCCs.
Local Council V (LC V) Chairmen	Districts are led by an elected LC V chairman who heads the district council. Budget-related decisions for districts are made in district councils. (Lower-level administrative units—county, sub-county, parish, and village—also have councils, which oversee smaller administrative units.)
District Health Officers	District health officers coordinate and manage the delivery of quality health services in their respective districts.
Nutrition Focal Persons/Officers	Nutrition focal persons/officers are based in local governments at the district and community levels. They coordinate nutrition activities within their area of responsibility.

Nutrition Status

While Uganda has made steady progress in food and nutrition security, malnutrition remains an important challenge and is an underlying or contributing cause to 60 percent of deaths among children under five.¹⁵ Malnutrition among Ugandan children continues to result from inadequate dietary intake, combined with malaria, diarrhea, and acute respiratory tract infections.¹⁶

The nutritional status of children under five has improved in recent years, and the prevalence of stunting declined from 45 percent in 2001 to 29 percent in 2016¹⁷—one of the lowest observed

"While Uganda has made steady progress in food and nutrition security, malnutrition remains an important challenge and is an underlying or contributing cause to 60 percent of deaths among children under five."

levels in East Africa, but still unacceptably high. Children from rural households and whose mothers have no education are more likely to be stunted

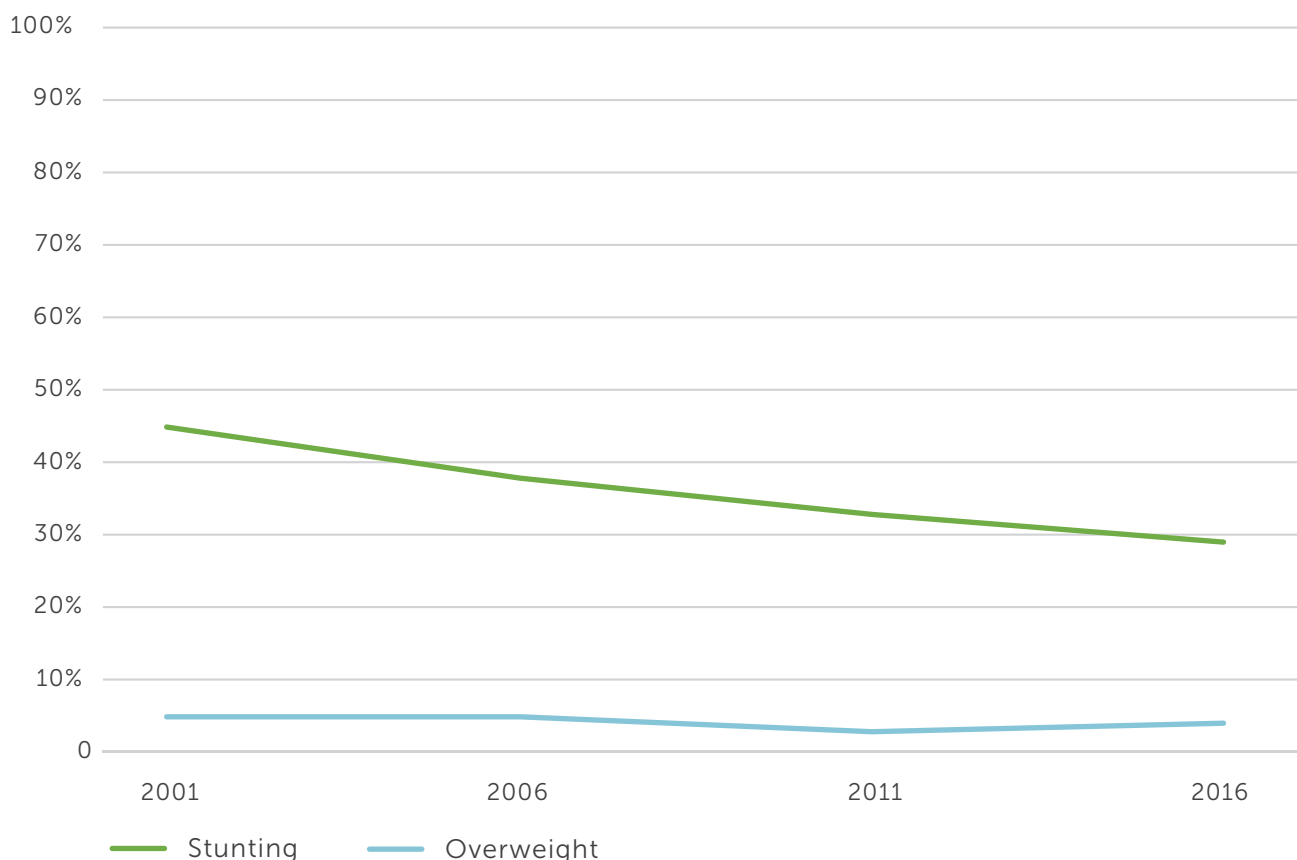
than their counterparts.¹⁸ There is also significant geographical variation, with the southwestern Tooro subregion, located in Uganda's food production region, recording a stunting prevalence of 41 percent.¹⁹

Progress in other nutrition indicators has been slow. The proportion of under-6-month-olds who are exclusively breastfed has remained relatively stable at around 66 percent over the past 16 years. However, this percentage decreases through the recommended six-month period as an infant ages: only 43 percent of 4- and 5-month-olds are exclusively breastfed. In addition, just 15 percent of children aged 6–23 months have a minimum

acceptable diet, meaning that they consume both enough food and essential nutrients.²⁰

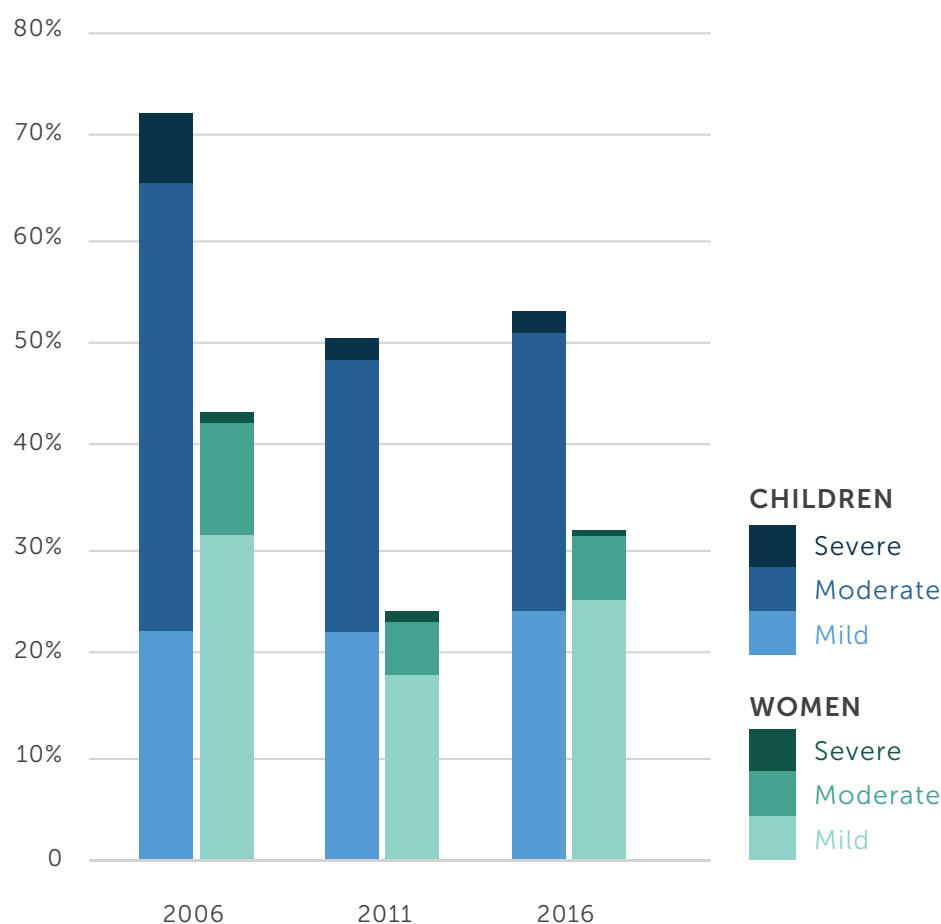
According to the latest Demographic and Health Survey (2016), anemia among children under five and women has risen,²¹ reversing earlier progress.²² Anemia affected 73 percent of children in 2006, dropping to 49 percent in 2011, before rebounding to 53 percent. Among women, the declining prevalence of anemia exhibited an even starker reversal: from 23 percent in 2011 to 32 percent in 2016. Although 38 percent of pregnant women are anemic, only 23 percent take iron supplements for the recommended 90-day period. Comparatively, only 16 percent of men are anemic.²³

Stunting and Overweight in Children Under Five in Uganda



Uganda Bureau of Statistics and ICF, "Uganda Demographic and Health Survey 2016," 2018, <https://dhsprogram.com/pubs/pdf/FR333/FR333.pdf>.

Anemia in Uganda



Uganda Bureau of Statistics and ICF, "Uganda Demographic and Health Survey 2016," 2018, <https://dhsprogram.com/pubs/pdf/FR333/FR333.pdf>.

Prioritization of Nutrition

In 2011, the government of Uganda launched the Uganda Nutrition Action Plan (UNAP) (2011–2016) to focus the attention of national- and district-level authorities on improving nutrition outcomes and elevating nutrition in the national agenda.²⁴ The primary goal of this plan is to reduce the burden of malnutrition in Uganda, with a special emphasis on women of reproductive age, infants, and adolescents.²⁵ The UNAP emphasizes the links between nutrition and national development and highlights the economic returns on nutrition investments. The plan formalizes improved

nutritional outcomes as a multisectoral endeavor and calls for scaling up nutrition interventions focused on the 1,000-day window. The UNAP, which was extended until the end of 2018, was jointly signed by eight ministries at its launch²⁶ and an additional one, the Ministry of Water and Environment, in 2016. The Office of the Prime Minister is responsible for coordinating the UNAP's implementation and is currently coordinating the development of its next phase.²⁷

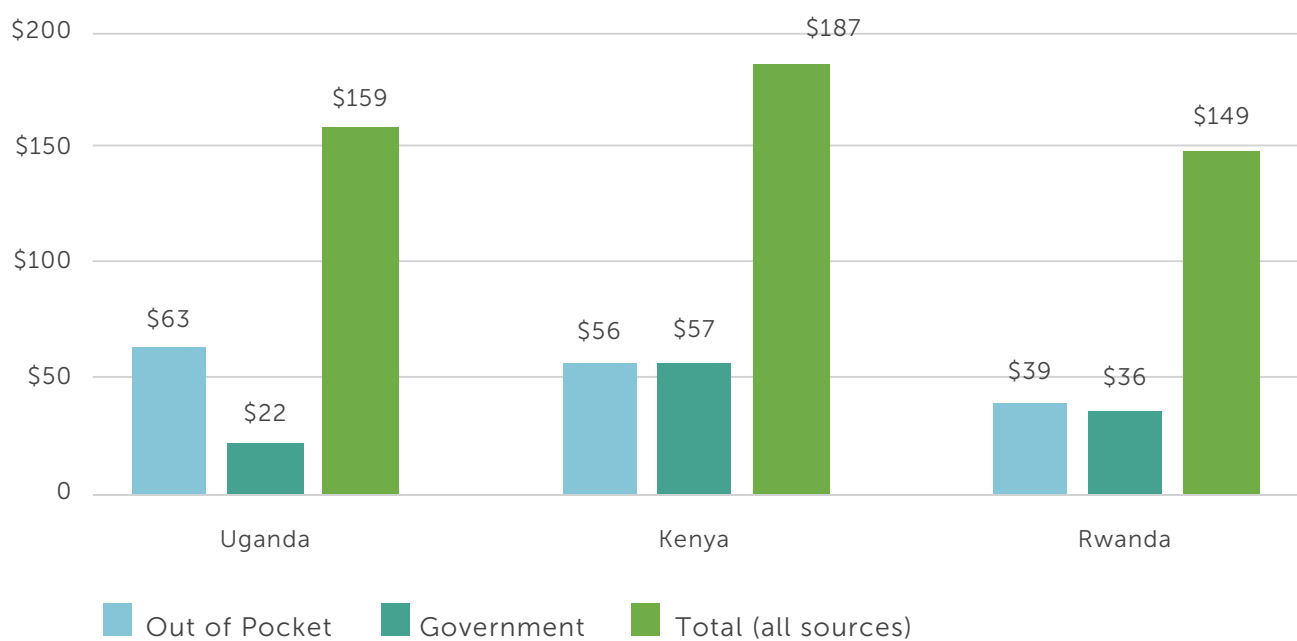
While the Uganda Nutrition Action Plan and other policies are well-designed, they lack the financial and human resources required to ensure

effective implementation and accountability. Uganda's national spending on health falls short of international, regional, and domestic targets. Uganda allocated only 7.8 percent of its budget to health in 2015, well short of the Abuja Declaration target of 15 percent.²⁸ Uganda's national spending on education, health, pensions, and social assistance is lower than the average of other East African countries.²⁹

The government of Uganda currently invests only \$22 per person on health-related costs, half of the World Health Organization per capita recommendation of \$44.³⁰ While donor countries and development partners help fill some of these budget shortfalls, a significant financial burden falls on the shoulders of Ugandan citizens in the form of elevated out-of-pocket expenditures. A mere 0.4 percent of the national budget is dedicated to nutrition-specific and nutrition-sensitive interventions in Uganda,³¹ and there are no line items for nutrition in any ministry budget.

"While the Uganda Nutrition Action Plan and other policies are well-designed, they lack the financial and human resources required to ensure effective implementation and accountability."

Per Capita Health Spending in Uganda, Kenya, and Rwanda by Source (2015)



All sources includes out of pocket spending, government health spending, prepaid private spending, and development assistance for health.

Institute of Health Metrics, "Uganda," <http://www.healthdata.org/uganda>

U.S. Support for Nutrition Programs in Uganda

The U.S. government has maintained bilateral relations with Uganda since 1962, when the country achieved its independence from the United Kingdom. Uganda is a key strategic partner for the United States, particularly in promoting regional stabilization and combating terror. The United States supports Uganda with a total development and security budget exceeding \$970 million per year.³²

The United States is the largest health donor in Uganda, providing over \$1 billion in global health funding over the past five years. Global health funding accounts for the largest share of U.S. assistance to Uganda; within that, by far the largest investment is HIV/AIDS programming through the President's Emergency Plan for AIDS Relief (PEPFAR) at \$364.60 million in fiscal year 2019. Malaria investments follow at \$30 million, family planning and reproductive health at \$17 million, maternal and child health at \$12 million, nutrition at \$7 million, and tuberculosis at \$3.50 million.³³

While the U.S. investment in nutrition accounts for a mere 2 percent of all U.S. health allocations, it constitutes around 80 percent of the entire national nutrition response.

The U.S.–Uganda Country Development Cooperation Strategy (CDCS) for 2016–2021, which lays out the U.S. mission's approach and expected results for USAID-implemented programs, identifies three areas of focus:

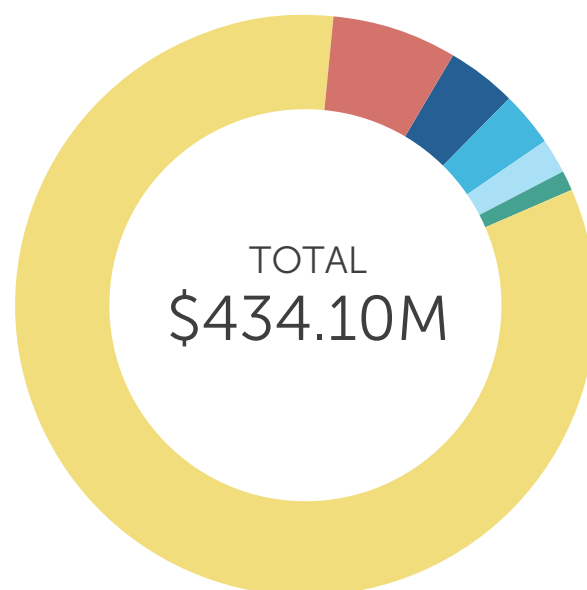
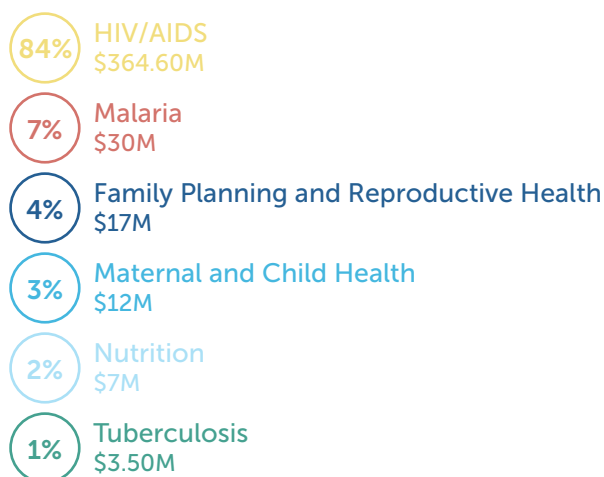
While the U.S. investment in nutrition accounts for a mere 2 percent of all U.S. health allocations, it constitutes around 80 percent of the entire national nutrition response.

increasing resilience, addressing demographic drivers, and strengthening systems. Although the CDCS maintains the prior strategy's sectoral focus, including on health, HIV/AIDS, and economic growth through agricultural development, the new strategy represents a shift in USAID's approach. By focusing on overlapping Ugandan and USAID priorities and working within local country systems, rather than in parallel, the new strategy is more directly aligned with national priorities and plans. Its integrated approach acknowledges that Uganda's development challenges, including nutrition, are intertwined and mutually reinforcing. The CDCS prioritizes the needs of adolescent girls and young women, stating that "the idea of the fourteen-year-old girl as the average Ugandan is the lens through which this strategy will be implemented, with all interventions being targeted to empower her to take charge of her future and to build a life

U.S. Health Funding for Uganda

By Sector, FY 2019

*Dollars in millions



Foreign Assistance, "Foreign Assistance in Uganda,"
<https://www.foreignassistance.gov/explore/country/Uganda>.

that is longer, healthier, and more productive and fulfilling than that of her parents."³⁴

Uganda is a focus country for major U.S. development assistance initiatives and plans—including PEPFAR, the President's Malaria Initiative, the Feed the Future Initiative, and Food for Peace³⁵—and a USAID priority country for maternal and child health, family planning, and nutrition. The United States also supports several public–private partnerships in Uganda, including the DREAMS initiative, which aims to reduce HIV incidence in adolescent girls.

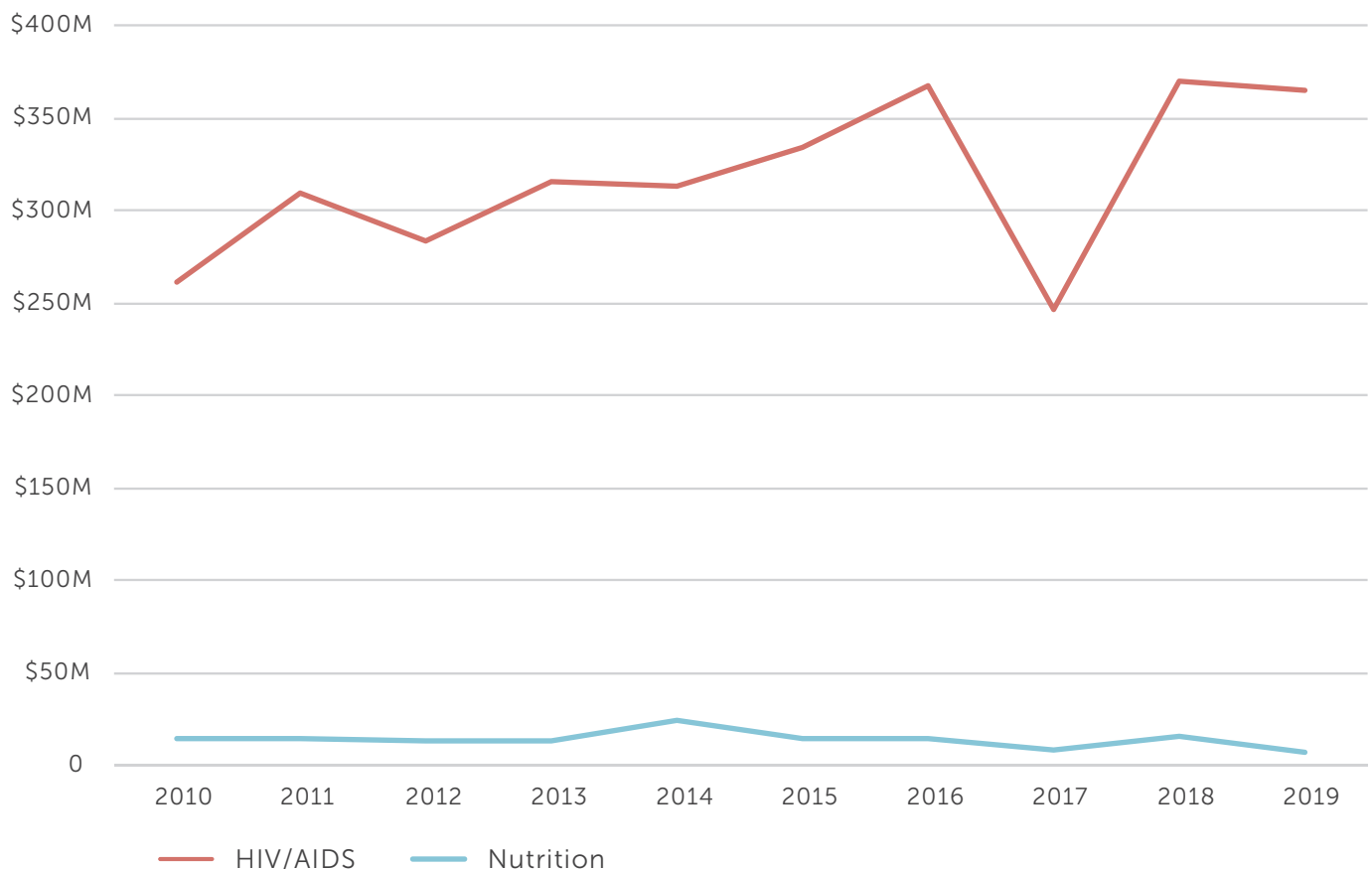
Uganda was among the original PEPFAR countries. At 84 percent of all U.S. health allocations, PEPFAR resources in Uganda dwarf U.S. investments in nutrition (2 percent). While most PEPFAR resources directly target HIV prevention and treatment, some PEPFAR resources support nutrition education and nutrition interventions for people living with HIV. All U.S.-funded ready-to-use therapeutic food in Uganda is funded through PEPFAR for acutely ill people living with HIV.

Feed the Future, which integrates nutrition across both agricultural and health sector investments, has focused on Uganda since it was launched in 2010.³⁷ Uganda has consistently received among the highest levels of funding across their original 19 focus countries, with an annual allocation generally between \$30 million and \$40 million. Their broader food security strategy for Uganda—unlike that of some of their other focus countries—highlighted nutrition from the outset: "Uganda's Feed the Future strategy rests upon our analysis of the way poverty and nutritional status interact in Uganda."³⁸ Feed the Future originally targeted 62 districts for its agricultural component and 47 districts for nutrition interventions as part of its zone of influence.

In addition to mainstreaming nutrition as a lynchpin to achieve a host of key development outcomes, the Feed the Future country strategy also highlighted the critical contribution of family planning. Voluntary family planning information and services can help significantly reduce the wealth and educational disparities associated

U.S. Government Funding

for HIV/AIDS and Nutrition in Uganda



Foreign Assistance, "Foreign Assistance in Uganda," <https://www.foreignassistance.gov/explore/country/Uganda>.

Feed the Future Uganda Activity Framework

in the 2011–2015 Multi-Year Strategy



USAID, "Feed the Future Uganda Multi-Year Strategy," 2011.

with child nutrition outcomes, but many country strategies do not focus on explicit considerations of high fertility and population growth. USAID/Uganda's focus on this pathway should be replicated in other high fertility contexts facing chronic food and nutrition insecurity.

The principal U.S. government agencies working on health in Uganda are USAID, the U.S. Centers for Disease Control and Prevention (CDC), the Peace Corps, the Department of State, the Department of Defense, and the National Institutes of Health. The USAID mission oversees the lion's share of U.S.-supported nutrition activities in Uganda. USAID/Uganda chairs and actively participates in various sector working groups, including the Nutrition Sector Donor Group, which engages in a national partnership forum to conduct structured dialogue with the Government of Uganda.³⁹ USAID is the SUN donor convener in Uganda⁴⁰ and coordinates with the Government of Uganda to support the nation's nutrition priorities by participating in forums overseen by the Office of the Prime Minister.

U.S.-supported nutrition activities in Uganda aim to reduce mortality, morbidity, and food insecurity by increasing the availability and use of nutrition interventions. Interventions include improving maternal diets through nutrition education, promoting exclusive breastfeeding and infant and young child feeding practices, developing and producing fortified or biofortified staple foods, promoting home and community gardens to improve dietary diversity, and delivering nutrition services, including micronutrient supplementation and acute malnutrition case management.⁴¹

In the context of decentralization, the majority of USAID's nutrition activities are implemented at the district level, as opposed to the national level. In 2017, U.S.-supported efforts reached over 1.7 million children with nutrition-specific interventions and 1,000 health professionals with nutrition-related training.⁴² At this writing, U.S. nutrition and food security programs are in a period of transition; several programs have recently closed while others are in the process of being awarded.

Key Observations and Challenges

This report makes a series of observations in eight broad areas.

Integration of Nutrition with Other Health Programs

U.S.-supported nutrition interventions are mainly carried out through five integrated regional health programs, which together target 64 districts across Uganda. Primarily funded by PEPFAR (over 75 percent), these programs use the PEPFAR platform to increase the availability, accessibility, and quality of healthcare by integrating HIV services with primary care services, including those for tuberculosis, malaria, nutrition, family planning and reproductive health, and maternal, newborn, and child health. Given that HIV and nutrition are mutually reinforcing priorities—establishing optimal nutrition contributes to achieving HIV goals, while addressing infectious disease improves nutrition outcomes—leveraging the PEPFAR platform to provide nutrition services is an approach that makes sense and can allow the same level of health outcomes to be achieved at a lower cost.

To promote country ownership, each implementing partner mentors and helps supervise the district health offices, health centers, and facilities that carry out all activities. Each of the regional programs have similar designs and goals, with slight variations in emphasis. The Regional Health Integration to Enhance Services in Southwestern Uganda (RHITES-SW) program, launched in 2015 and the first of the regional programs to become active, provides support to 690 health facilities in 14 districts in southwest Uganda.⁴³

The RHITES-SW program trains health care workers on the Nutrition Assessment, Counseling, and Support (NACS) approach⁴⁴ and ensures that nutrition services are integrated into all delivery points, allowing a patient to receive multiple services, including nutrition services, in a single appointment. The program also connects communities with health facilities by partnering with village health teams and the People Living with HIV Network, who refer community members to facilities for health services, including nutrition services.⁴⁵

The goal of integration is to ensure that all of a patient's health needs are addressed when he/she accesses health services. Given the many drivers of malnutrition, improving nutrition requires strong integrated primary health care systems rather than a vertical approach. An integrated approach is therefore particularly valuable for nutrition and in line with the USAID Multisectoral Nutrition Strategy, the Global Food Security Strategy, the CDCS, and the UNAP.

It is too early to understand the impact of integrated services on nutrition through the RHITES programs. However, integration is not without its challenges. While integrated services allow a patient to receive many services in a single appointment, these visits can become more time consuming and it can be a challenge for health care workers to spend more time with each patient, given high demand. Integration also requires healthcare providers to receive additional training, including in the NACS



Photo: © Stephan Gladieu / World Bank

approach. This poses a particular challenge in a context that includes high rates of absenteeism by critical health providers, failure to fill vacant positions in health facilities, inadequate retention of hired staff, and low motivation of health workers, especially in rural facilities. Further, given that the regional health integration programs depend highly on PEPFAR funding and strategy, there is a concern that HIV care and treatment services will overshadow other areas, including nutrition, and that the focus on nutrition will be diluted.

Data at the District Level

Current nutrition data in Uganda are limited in several ways. At the national level, the Demographic and Health Surveys, conducted every five years,

currently provide the most reliable source of data on nutrition and its key determinants. To collect data at more frequent intervals, USAID and CDC are partnering to add nutrition indicators to an existing Government of Uganda panel surveillance system that surveys households twice a year and previously collected only socioeconomic and agriculture data. If successful, this approach will be exported to neighboring countries.⁴⁶ However, neither of these survey instruments provide information at the district level. In addition, few nutrition indicators are currently included in health management information systems.⁴⁷

Significant data gaps for nutrition at the district level are due to the lack of district reporting on nutrition indicators and unstandardized data from projects,

which cover different geographies, target groups and organizations, and time periods. The lack of a standardized methodology for data collection and inconsistent data quality across projects limits the ability to pool data from various sources. An additional challenge is that nutrition-specific data are not integrated with data on nutrition-sensitive areas, such as disease morbidity, despite the availability of integrated services. It is therefore difficult for policymakers to attribute changes in nutrition indicators, account for regional differences across the country, estimate the relative contributions of each of the various drivers of malnutrition to a district's malnutrition burden, and subsequently plan an appropriate multisectoral district-level response.⁴⁸

Adolescent Girls and Young Women

U.S.-supported nutrition interventions in Uganda solely target children under five and pregnant and lactating women. Despite being prominently featured in Uganda's CDCS, adolescent girls and young women are not a target population for nutrition services unless they are pregnant or lactating.

Addressing the nutritional needs of an adolescent girl or young woman only after she is pregnant is too late since many nutritional risks cannot be quickly reversed. Late childhood and adolescence are critical periods both for addressing an adolescent girl's nutritional needs and for preventing low birth weight and stunting in her future children. To achieve full childhood and adolescent growth, nutrition interventions should continue beyond age five into late childhood and early adolescence.⁴⁹ This is especially important in Uganda, where over half of adolescent girls have begun childbearing by age 19.⁵⁰

Expanding access to voluntary family planning information and services among adolescent girls and young women is also critical to addressing malnutrition, since high fertility is linked to malnutrition. The poorest Ugandan women begin childbearing a full two years earlier, on average, than their wealthier counterparts, and the poorest 20 percent of women have 7.1 births on average,

"The compounding long-term effect of starting childbearing earlier leads to larger family sizes for those women and men who are least able to invest in the next generation."

posing a serious constraint on adequate health, nutrition, and care for each child within a low-income household. The education gradient is even steeper: uneducated women have their first child at age 18, on average, while those with post-secondary education don't begin childbearing until age 24.⁵¹ Children born to adolescent girls and young women are at increased risk of malnutrition, illness, and death. This is evidenced by a 33 percent higher risk of stunting among firstborn children of girls under the age of 18.⁵² High fertility is also associated with maternal anemia which, in turn, contributes to low birth weight babies who face an increased risk of acute and chronic malnutrition and infection.⁵³ The compounding long-term effect of starting childbearing earlier leads to larger family sizes for those women and men who are least able to invest in the next generation.

Expanding access to nutrition and family planning services among adolescent girls and young women will require using existing platforms in innovative ways and developing new, creative multisectoral platforms to reach them.

Knowledge About Nutrition

Population knowledge gaps around basic nutrition behaviors were repeatedly cited as a challenge during the CSIS field research. This lack of knowledge is reflected in Uganda's poor infant and young child feeding practices, in consumers choosing unfortified products, and in poor food preparation, harvesting, and storage practices. There is evidence that marginal improvements in knowledge can lead to better decisions and

ultimately better health outcomes. For example, early HarvestPlus research in Uganda found no difference in consumers' willingness to pay for white or orange sweet potato varieties in the absence of nutrition information. However, once respondents were educated about the benefits of the more nutritious orange option, they were willing to pay a premium for it.⁵⁴

The U.S. is addressing this lack of knowledge through its regional integrated health programs and Feed the Future fortification activities. The RHITES-SW program uses multisectoral, community-level health care platforms to reach women of reproductive age and children under five with nutrition information. The program forms family health groups, which are convened by a peer educator who conducts sessions on a range of health topics, including maternal nutrition, breastfeeding, infant and young child feeding practices, and family planning. The program also develops demonstration gardens where information on how to grow and prepare micronutrient-rich foods is shared with family health groups during demonstration sessions and with pregnant and lactating women during antenatal care visits. RHITES-SW also trains health professionals on the benefits, production techniques, basic preparation, and storage practices of biofortified crops.⁵⁵ HarvestPlus provides local farmers and village groups with information on the nutritional value of biofortified crops (see the section on biofortification legislation for more details).

However, while lack of knowledge about nutrition is considered to be a critical barrier to improved nutrition practices, little data on nutrition knowledge, attitudes, and behavior in Uganda is available. This data would enhance interventions by determining whether there is a need to move beyond interventions that focus on information sharing and knowledge acquisition to more broad-based social behavior change for nutrition. More research is also needed on the nutritional needs, habits, and access to healthy foods of Uganda's growing urban population.

Social Marketing of Fortified Foods

Uganda is a regional leader on commercial food fortification, with a history of early efforts in the 1990s and great strides over the past decade to scale up investment. Early fortification programming began with iodized salt, then expanded to wheat and cooking oil, both of which are fortified with iron and vitamin A. Since 2013, as a result of the 2011 Food and Drugs Act, Ugandan maize millers with productive capacity of 20 tons or more per day have been legally mandated to fortify their production. The regulation requires all imported maize flour, wheat flour, and edible fat and oil to be fortified as well. All wheat flour is now fortified due to the large-scale nature of its production, along with about 80 percent of the cooking oil.

Disadvantaged communities in rural areas with high burdens of malnutrition consume little to no wheat, and the maize they consume is locally grown and processed. A significant challenge to improve nutritional outcomes through commercial fortification is that the majority of Uganda's maize millers operate on a scale that is well below the threshold of 20 metric tons per day, exempting them from the legal fortification requirement. Additionally, these millers process maize grown by local households in small batches with iron hammers, rather than with heavy industrial equipment. Contamination of flour with iron hammer flecks, and also with aflatoxins prevalent from harvest management and storage practices, poses at least an equal threat to the health of consumers as do high deficiencies of vitamin A and iron.⁵⁶

Social marketing of improved maize in Uganda has a long way to go. The taste and color of maize flour are affected when fortified, making it less desirable to consumers. Commercial roller mill technology produces a coarser and less preferred texture of flour than do traditional community steel hammer mills. Consumer unwillingness to pay higher prices for a less flavorful product makes it difficult for fortified maize to compete with unfortified maize flour, which is the majority of market supply. Packaging must also be

"Social marketing of improved maize in Uganda has a long way to go. The taste and color of maize flour are affected when fortified, making it less desirable to consumers."

improved to prevent vitamin deterioration, and fortified flour must also be protected from heat as it is stored, distributed, and sold. Moreover, consumers remain largely uninformed about fortification's value and a rumor persists that micronutrient premixes are unsafe and damage fertility. Social marketing campaigns to improve consumer awareness and nudge behavior change are a missing piece in efforts to scale up consumption of fortified flours.

USAID has made a series of fortification project investments in Uganda since 2000. Through the five-year Strengthening Partnerships, Results, and Innovations for Nutrition Globally (SPRING) project (2012–2017), the United States has grown the capacity of Uganda's food fortification program by providing the government of Uganda with technical assistance and leadership on enforcing food fortification laws and standards and helping create demand for fortified foods. The SPRING project helped revitalize the National Working Group on Food Fortification, a unique public–private partnership, chaired by the Ministry of Health, that coordinates the implementation and supervision of all food fortification activities. With technical assistance from SPRING, the working group released the 2017 National Industrial Food Fortification Strategy (2017–2022), which proposed a budget, action plan, and evaluation framework for the country to increase its production, trade, and consumption of fortified foods. It further emphasized a need for private- and public-sector cooperation and recommended that the use of fortified products be mandatory in government institutions, such as schools.

To improve consumer awareness of fortified foods, SPRING spearheaded a country-wide communication campaign in 2016, distributing posters, leaflets, and factsheets that improved the public's awareness of the benefits of fortified foods and how to identify them.⁵⁷ SPRING also conducted research on the barriers to and enablers of the use of fortified maize flour in boarding schools.⁵⁸

Biofortification Legislation

Biofortification—the improvement of crop varieties to enhance their nutritional value—represents a more direct point of entry into the consumption patterns of poor, rural communities with disproportionate burdens of malnutrition. Biofortified crops can be developed through both conventional breeding and transgenic processes.⁵⁹ Increased production of biofortified crops, for both market sales and household use, improves access to a diversified diet for households that purchase much of their food, and even more so for many households that feed their families through subsistence farming. Ugandan women represent over 70 percent of the country's agricultural labor force and are also mainly responsible for child feeding.⁶⁰ Improving the nutrition knowledge of these caretakers while facilitating access to improved crops allows development investments to reach a segment of society wholly apart from that which might purchase fortified wheat or oil in a supermarket.

Biofortified crops in Uganda include high iron beans and sweet potato. High iron beans are distributed through the formal seed system and five varieties were released in 2016. The colors and varieties are well matched with regional preferences and seed companies appreciate their commercial value. There is a functioning market system for bean seeds, unlike for sweet potato, which has made this newer focus crop easier to scale. Sweet potato, at least in its unprocessed form, has been a less commercially viable crop than high iron beans. Uganda is the second largest producer of sweet potato globally, after China.



Photo: Georgina Smith / CIAT

The U.S. has supported biofortification in Uganda through HarvestPlus, whose most recent five-year program ended in 2016. HarvestPlus collaborated with the National Agriculture Research Organisation (NARO) to breed improved crops to support better nutrition. HarvestPlus's work in Uganda has invested in developing and disseminating iron-enriched beans and orange-flesh sweet potato rich in beta-carotene, which the body converts to vitamin A. The program maintains a tissue culture partnership with Makerere University for micropropagation, which entails cleaning and virus removal. Secondary multiplication is managed by a network of farmers in an effort to move towards a commercialized system.

HarvestPlus partners with "lead mothers" in communities to promote the consumption of biofortified crops by marketing their nutritional value.⁶¹ At the outset of the program, just one in 20 target farmer families purchased seeds, on average.⁶²

Five years later, that proportion had increased fourfold, to one in five households. The increase is significant but leaves substantial room for growth.

There is an active and ongoing conversation about commercial strategies. HarvestPlus, in partnership with Makerere University, is working on commercialization and Farm Radio International has produced an interactive radio show on the topic which has aired in seven languages across 13 districts. The radio show connects small-scale farmers with vine distributors through a program called "Beep2Seed," which allows them to purchase appropriate quantities delivered to their communities.

In addition to private sector commercialization, HarvestPlus has brought biofortified crops to health centers in western Uganda and into the school system, with beans used to pay school fees in some areas.

Finally, HarvestPlus has collaborated with Uganda's National Crops Resources Research Institute (NaCRRI), a part of the National Agriculture Research Organization, in its work to release orange maize next year. CIMMYT has also been engaged with this partnership and may also collaborate on pearl millet in the future.

Biofortification investments in Uganda are broadly hindered by the government's inability to pass a law to implement the Biotechnology and Biosafety Act (see text box). This report addresses biosafety regulations, but not commercialization regulations, which are distinct and important.

Biotechnology Regulation

A Moving Target

Uganda adopted its National Biotechnology and Biosafety Policy in 2008, but a law to guide the policy's implementation remains in draft form with the Ministry of Finance, Planning, and Economic Development.⁶³ The law's passage is a requirement for Uganda's compliance with international standards as a signatory of the Cartagena Protocol on Biosafety. The stalled legislation has grown increasingly urgent in light of the government's decade-long investment in biotechnology research and development. The National Agricultural Research Organisation (NARO) relies on biotechnology—either conventional breeding or genetic engineering (genetic modification)—to develop improved varieties of staple crops, such as maize, banana, and cassava, that are drought- and disease-resistant and, in some cases, have augmented nutritional value.

Genetically engineered crops cannot be released to farmers for commercial and household production until a regulatory law is passed. Biofortified orange-fleshed sweet potato, in contrast, is produced through conventional breeding and its commercial footprint is expanding rapidly. But vitamin A and iron-enhanced banana is restricted from release despite its potential to reduce malnutrition on a broad scale. NARO initiated field trials of some genetically engineered crops in 2007. These varieties will be released to Ugandan farmers either at no cost or at the same cost as conventional seeds for unimproved crops. Genetically modified crops can then be replanted with good yields, while hybrid varieties such as maize see significant yield declines in the second generation and farmers are advised to plant them for only one season. Bananas, sweet potato, and cassava are propagated with suckers or cuttings, and these can be replanted with good results.

A version of the bill passed the Ugandan Parliament in October 2017, but President Museveni sent it back to legislators for further review in December rather than signing it into law, citing concerns that included patent rights of indigenous farms and labeling.⁶⁴ A current version includes provisions for minimum planting distances between genetically engineered and conventional varieties to prevent cross-pollination.⁶⁵ The new bill requires a minimum distance of 200 meters (656 feet) between organic maize crops and genetically modified maize crops, and 100 meters (328 feet) between organic cassava and its genetically modified analogue. Similar requirements are also included for cotton, a major export, and other crops. These distances pose a particular challenge for smallholder farmers, many of whom work on two acres or less. The distance requirement effectively means that these farmers would need to choose between conventional and genetically improved crops, given an inability to leave the required fallow spacing between the two.

The agricultural community remains anxious for the law's passage to unlock access to many improved crops, including cassava and maize. Losses to cassava brown streak disease alone have been estimated at \$24.2 million annually.⁶⁶ The release of Bt (*Bacillus thuringiensis*) maize that is resistant to stem borer and fall armyworm could save the country millions more.⁶⁷ At this writing, the bill has not moved forward.⁶⁸

Decentralization

While health care service delivery in Uganda takes place at the district level, a district-level focus on nutrition is relatively new and has encountered some early implementation challenges. Multisectoral approaches at the district level are unconventional, and if a given nutrition activity doesn't fit squarely within the purview of a single government entity, no one may take ownership of it. Additionally, keeping a focus on nutrition in the midst of many competing priorities has been a challenge, especially when nutrition does not constitute a line item in district budgets and districts are not required to report nutrition indicators. With frequent elections and political turnover, educating and sensitizing new government decisionmakers takes constant effort.

Through the Food and Nutrition Technical Assistance (FANTA) project, the U.S. has piloted district-level engagement in five northern and five western districts. Each district council approved a locally tailored action plan led by District Nutrition Coordination Committees. FANTA has also trained these committees in evidence-based advocacy for nutrition resources.

At the national level, through FANTA, the U.S. has supported the government in political leadership and technical capacity, partnering with both the Nutrition Secretariat and line ministries. FANTA has collaborated extensively with the Ministry of Health, improving central systems and developing protocols for health workers and training staff. Nutrition indicators have been newly integrated, and the Ministry's Nutrition Division can now produce quarterly reports. FANTA provides further support to the Ministry of Agriculture, Animal Industry, and Fisheries, emphasizing the production and consumption of diverse, nutritious foods. It developed a nutrition handbook for agricultural extension workers to better plan farmer activities, including nutrition sensitization and demand creation for diverse crops.

The United States is currently considering the best way to enhance the government of Uganda's leadership in nutrition and maternal

"The nutrition sector in Uganda, like many other domains of health and social welfare, is acutely underfunded."

and child health, including whether to focus government engagement at the national or district level. USAID has recently issued a request for information to solicit feedback on how to best facilitate government-led leadership and enhance sustainable government multisectoral coordination efforts to accelerate gains in nutrition and maternal, newborn, and child health outcomes.⁶⁹ Going forward, it will take heightened engagement, advocacy, and capacity building to prioritize nutrition at the district level.

Domestic Resource Mobilization

The nutrition sector in Uganda, like many other domains of health and social welfare, is acutely underfunded. Given a young and rapidly growing population, mass migration, and high dependency ratios, this inadequate health investment is alarming.

Uganda's young population represents a development opportunity for the country. If Uganda invests in the health of its young population and seeks to provide adequate educational and employment opportunities alongside expanded access to voluntary family planning, the country has the opportunity to reap significant demographic dividends. If, on the other hand, national capacities are stretched and health, education, and economic systems continue to be inadequately funded, Uganda's young population risks marginalization, posing a threat to the country's stability.⁷⁰

Recognizing that few civil society organizations have been engaged in influencing policymaking, budget allocations, and service planning processes and priorities, USAID launched the five-year Advocacy for Better Health (ABH) project in 2014. The project aims to engage communities in planning and monitoring health and social services, enhance the capacity of civil society

organizations to represent citizen interests, and conduct advocacy to strengthen health-related policies, budgets, and programs.⁷¹

The ABH project operates in 35 districts and at the national level and works in partnership with more than 20 civil society organizations, including the Family Life Education Program and the Uganda Red Cross Society. The project focuses on three crosscutting areas—domestic health financing, human resources for health, and health commodity security—and on several treatment areas, including HIV/AIDS, tuberculosis, malaria, nutrition, family planning and reproductive health, and maternal, newborn, and child health.⁷²

Although the results of advocacy work can be difficult to measure, the ABH project has gained traction in a number of areas. In September 2017, the project and the Uganda Parliamentary Forum on Quality of Health Service Delivery hosted the first-ever Ugandan Presidential Forum on Health. This event brought together more than 400 cabinet ministers, members of parliament, resident district commissioners, district chairpersons, and civil society organizations for a meeting focused on the need for increased funding for health and interventions to improve the quality of health services.⁷³ This meeting represents an important step in the right direction.

Recommendations for Strengthening U.S.–Uganda Cooperation on Nutrition

The United States should consider the following policy options for enhancing its partnership with the government of Uganda:

- **While continuing to accelerate support for strategically integrating nutrition with other primary care services, ensure that the focus on nutrition is not diluted by integration.** Because U.S.-supported integrated health programs depend highly on PEPFAR funding and strategy, there is a concern that HIV care and treatment services will overshadow other focus areas, including nutrition. The United States should prioritize accountability for nutrition by ensuring that health care providers are adequately trained to provide nutrition services and that nutrition indicators are closely tracked and reported. In addition, as the regional integrated programs are implemented, research should be conducted to ensure that the individual program areas benefit from integration rather than losing resources or attention, and that integration translates into real results. Given Uganda’s difficulties in recruiting and retaining health workers, another challenge to monitor is the added demand that integrated services puts on the country’s health workforce.
- **Prioritize the collection of nutrition data and its use in decisionmaking, particularly at the district level.** Existing nutrition data at the district level is difficult to use for multisectoral decision-making, since it is not integrated with data on nutrition-sensitive areas and mainly comes from donor-supported projects, which cover different geographies, target groups and organizations, and time periods. To ensure that data are available and easy to use by decisionmakers at local, district, and national levels, a single, integrated data platform that collects data on nutrition-specific and nutrition-sensitive areas from different sectors, stakeholders, and administrative levels is needed. This platform would require a plan for how to operationalize it that includes training for district and local officials. The United States should work with the Government of Uganda and other donors, including the National Information Platforms for Nutrition,⁷⁴ to help develop an integrated data platform and action plan.
- **Increase knowledge of and demand for improved nutrition at the community level by building on foundational investments.** Population knowledge gaps around basic nutrition behaviors were repeatedly cited during CSIS field research as one of the biggest challenges to advancing nutrition. While continuing to provide nutrition information through community- and facility-based approaches, including family health groups and demonstration gardens, the United States should expand social-behavioral change strategies—including advertising campaigns to promote understanding of both commercially fortified and biofortified foods—and political advocacy with civil society partners. The United States should also collect data on nutrition knowledge, attitudes, and behavior, including among the urban population, to enhance targeted interventions aimed at improving behavior change.

- **Elevate the focus on adolescent girls and young women.** While the Government of Uganda and USAID have prioritized reaching young people with health services, there is no clear plan to do so at the scale required to lay the groundwork for a demographic dividend. U.S.-supported nutrition interventions solely target children under five and pregnant and lactating women, in effect excluding non-pregnant adolescent girls and young women. This is a problematic gap given that late childhood and adolescence are critical periods both for addressing an adolescent girl's nutritional needs and preventing low birth weight and stunting in her future children. U.S.-supported nutrition interventions should continue beyond age five into late childhood and early adolescence. This will require better information (e.g., data disaggregated by sex, age, marital status, and economic standing) and developing standardized nutrition indicators for this age group. In addition, expanding access to voluntary family planning information and services among adolescent girls and young women is critical to addressing malnutrition.

Given the barriers to reaching adolescent girls and young women in health facilities, impacting adolescent choices and outcomes will require both using existing platforms in new ways and developing creative multisectoral platforms. The United States should build upon the existing DREAMS platforms by integrating a nutrition intervention. Another approach would be to target girls in secondary schools, including through school health programs. Given that the majority of Ugandans—including adolescent girls and young women—regularly attend religious services, the United States should consider engaging religious leaders, who represent an important channel of communication in Uganda, about the importance of nutrition so that they may speak publicly to their communities about nutrition. Finally, an additional avenue may be the formal and informal financial services that complement household resilience and childcare practices. The livelihoods and income-generating prospects of young women and men, combined with improved knowledge about and demand for improved nutrition outcomes, will have a marked impact on the ability of the next generation of Ugandan families to raise a generation of well-nourished and capable citizens.

- **Continue to support the government of Uganda's efforts to pass the Biotechnology and Biosafety Act into law.** Many improved crop varieties with improved nutrition and/or disease-, pest-, and drought-resistance have emerged through genetic engineering. With U.S. support, several of these crops have been under development and testing with the National Agriculture Research Organization for over a decade. Biofortification investments are broadly hindered by the government's inability to pass the Biotechnology and Biosafety Act into law.⁷⁵ Clearing this legal roadblock to their commercial release will drive both health and economic benefits for smallholder farmers whose production is increasingly threatened by a changing climate. It will also improve economic growth nationally by allowing Uganda to better compete with its regional neighbors in agricultural trade. The United States should support research and advocacy to engage the Ugandan people on the benefits and costs of biotechnology so that they may contribute to the debate. Ultimately, for legislation and enforcement to be effective, it must be country-driven and country-owned.
- **Further strengthen the bilateral dialogue about long-term planning and mobilizing domestic resources to reach nutrition goals.** The nutrition sector in Uganda, like many other domains of health and social welfare, is acutely underfunded. Uganda's dependence on donor financing to support basic government health spending is unsustainable. As the United States considers the best way to enhance the government of Uganda's leadership in nutrition and maternal and child health, it should consider approaches to incentivize the Gov-

ernment of Uganda to mobilize greater domestic resources for nutrition, at both national and local levels, including through the technical support it provides to District Nutrition Coordination Committees. This is in line with USAID Administrator Green's strategic transitions agenda and the Country Development Cooperation Strategy which both emphasize building the country's self-reliance and ability to plan, finance, and implement solutions to its development challenges as a top priority. Further, the United States should elevate nutrition by incorporating it into talking points at senior levels between U.S. government and Ugandan officials so that it becomes a part of the ongoing dialogue about the bilateral relationship.

Endnotes

- 1 Cathryn Streifel is associate director of the CSIS Global Health Policy Center. Reid Hamel is a senior associate (non-resident) with the CSIS Global Food Security Project. Sara M. Allinder is executive director and senior fellow with the CSIS Global Health Policy Center. This report is based largely on an April 2018 research trip to Uganda conducted by Reid Hamel and Sara M. Allinder. It draws upon interviews and site visits conducted in Kampala and the country's southwestern region. The authors are grateful to everyone who shared his or her time, insights, and perspectives in preparation for and during the trip, although the views expressed here are solely those of the authors. The authors would also like to thank CSIS Global Food Security Project research intern Hailey Dougherty for her research support.
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- 12 USAID, *USAID Uganda Country Development Cooperation Strategy 2016–2021* (Washington, D.C.: USAID, 2017), https://www.usaid.gov/sites/default/files/documents/1860/CDCS_FINAL_26092017.tags_.pdf.
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- 16 Lilia Turcan and Tim Bene, *A Review of Policies for Improving Human Nutrition in Uganda and the Use of Evidence for Making Policy* (Montpellier, France: Agropolis International, Global Support Facility for the National Information Platforms for Nutrition Initiative, 2017), <http://www.nipn-nutrition-platforms.org/IMG/pdf/nutrition-policy-making-uganda.pdf>.
- 17 Stunting is defined as low height for age and is a sign of chronic malnutrition, particularly within the first 1,000-day window from pregnancy to a child's second birthday. Poor maternal nutrition, feeding practices, and food quality, as well as frequent infections contribute to stunting. Stunting is associated with reduced motor development, impaired cognitive function, poor school performance, and lower earning potential as an adult. Childhood stunting is estimated to reduce a person's potential lifetime earnings by at least 10 percent.
- 18 Uganda Bureau of Statistics (UBOS) and ICF, *Uganda Demographic and Health Survey 2016* (Kampala, Uganda and Rockville, MA: UBOS and ICF, 2018), <https://dhsprogram.com/pubs/pdf/FR333/FR333.pdf>.
- 19 "Uganda: Nutrition Profile," USAID.

- 20 UBOS and ICF, *Uganda Demographic*.
- 21 Anemia is a complex condition marked by low levels of hemoglobin in the blood. While iron deficiency is the most common cause of anemia accounting for 50 percent of cases, other causes include malaria, hookworm, and other helminths, other nutritional deficiencies, chronic infections, and genetic traits in malaria-endemic areas. Anemia is associated with impaired cognitive development, fatigue, and lethargy, which impacts one's ability to go to school and work. Childhood anemia is associated with a 2.5 percent drop in adult wages. In pregnant women, anemia increases the risk of adverse maternal and newborn outcomes, such as miscarriage, stillbirths, prematurity, and low birth weight. It is estimated that eliminating iron-deficiency anemia would increase adult productivity by 5 to 17 percent.
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- 27 Turcan and Bene, *A Review of Policies*.
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- 30 "Uganda," Institute of Health Metrics, <http://www.healthdata.org/uganda>.
- 31 IFPRI, *Global Nutrition Report*. Nutrition-specific interventions address immediate determinants of malnutrition and include the management of malnutrition, direct supplementation of minerals and nutrients, the promotion of breastfeeding, and other activities. Nutrition-sensitive interventions refer to areas that have an impact on overall nutrition goals and include family planning, water and sanitation, disease prevention and treatment, and education.
- 32 "U.S. Relations with Uganda: Bureau of African Affairs Fact Sheet," U.S. Department of State, May 22, 2018, <https://www.state.gov/r/pa/ei/bgn/2963.htm>.
- 33 "Foreign Assistance in Uganda," [ForeignAssistance.gov](https://www.foreignassistance.gov/explore/country/Uganda), <https://www.foreignassistance.gov/explore/country/Uganda>.
- 34 USAID, *USAID Uganda Country Development*.
- 35 This report does not cover the U.S. investments in nutrition through the Food for Peace program.
- 36 DREAMS, which stands for Determined, Resilient, Empowered, AIDS-Free, Mentored, and Safe, is a public–private partnership between PEPFAR, the Bill & Melinda Gates Foundation, and the Nike Foundation (now the Girl Effect), later joined by Johnson & Johnson, ViiV Healthcare, and Gilead Sciences.
- 37 Uganda was a Feed the Future focus country in the initiative's first phase (2010–2017) and is now a target country in the second phase.
- 38 USAID, *Feed the Future Uganda Multi-Year Strategy*, (Washington D.C.: USAID, 2011), p. 5.
- 39 USAID, *USAID Uganda Country Development*.
- 40 Uganda has a large bilateral and multilateral donor community. In addition to the United States, the UK's Department for International Development (DFID), the European Union, Irish Aid, and several United Nations agencies, including

UNICEF, the World Food Program, and the Food and Agriculture Organization, are the main providers of nutrition support to Uganda.

- 41 "Foreign Assistance in Uganda," ForeignAssistance.gov, <https://www.foreignassistance.gov/explore/country/Uganda>.
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- 43 RHITES-EC focuses on 11 districts in east central Uganda; RHITES-N Acholi focuses on 8 districts in the Acholi sub-region of Northern Uganda; RHITES-N Lango focuses on 8 districts of the Lango sub-region of Northern Uganda; RHITES-E focuses on 21 districts in Eastern Uganda and 2 districts in Karamoja.
- 44 The Nutrition Assessment, Counseling, and Support (NACS) approach involves three main elements: i) conducting a nutrition assessment to track a patient's growth and weight trends; ii) providing counseling to identify patient preferences, barriers to behavior change, and possible solutions; and iii) issuing nutrition support in the form of therapeutic and supplementary foods, if needed. The NACS approach can be implemented at both the facility and community levels. For more information, see Food and Nutrition Technical Assistance (FANTA), "Defining Nutrition Assessment, Counseling, and Support (NACS)," Technical Note No. 13, July 2012, https://www.fantaproject.org/sites/default/files/resources/FANTA-NACS-TechNote-Jul2012_0.pdf.
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1616 Rhode Island Avenue NW
Washington, DC 20036
202 887 0200 | www.csis.org