

Marie Meyer  
Wayzata High School  
Plymouth, MN  
Kyrgyzstan, Malnutrition

## **Lifting the Triple Burden of Malnutrition in Kyrgyzstan**

### **1. Introduction**

Kyrgyzstan, a developing country located in Central Asia, has reached stage four of the theory of the nutrition transition, a stage characterized by high consumption of processed foods and fiber, low activity rates, and high obesity rates. Although there is a high consumption rate of processed foods, they also have a serious malnutrition problem. According to the World Food Programme, Kyrgyzstan still sees stunting in about 11% of children along with a significant number of women and children who suffer from iron and iodine deficiency. For example, 38% of children and 62% of pregnant women are affected with anemia and 43% of school-aged children show an iodine deficiency (WFP). Kyrgyzstan has also experienced an increase in noncommunicable diseases (NCDs), including cardiovascular disease, cancer, and diabetes. NCDs are currently the leading cause of death. However, the geography of the region, mixed with the Russia-Ukraine conflict along with protests in the neighboring country Kazakhstan, makes finding successful solutions to their malnutrition problem particularly challenging.

### **2. Kyrgyz Culture and Geography**

Further complicating matters, Kyrgyzstan is landlocked in an entirely mountainous region that is home to just over 6 million people, making the country slightly smaller than South Dakota. There are eight administrative regions, referred to as oblasts, and the capital is Bishkek. Kyrgyzstan has a vast history of nomadic peoples, and today 64% of the population lives in rural areas (USAID). Unsurprisingly, two-thirds of food-insecure Kyrgyz live in rural populations (WFP).

The peaks and valleys of the Tien Shan mountain range encompass the entire country. Approximately, 40% of the land in Kyrgyzstan is over 3,000 meters in altitude under permanent snow and ice. It was once an important stop on the ancient Silk Road, and today many of the routes through the mountains remain the same. However, the infrastructure dates back to its occupation under the Soviet Union, and traveling throughout the country remains a challenge. The roads are essential in Kyrgyzstan for they are virtually the only way for people to get their goods to a good trade hub. The mountains make for a vast diversity in climate as it is dry continental to polar in the Tien Shan mountains and subtropical in the southern parts. The mountains are both a blessing and a curse as few roads are not open year-round due to weather conditions, but a whopping 79.4% of the power produced in the country is hydroelectric. The variance in climate also means that only 56% of the land is classified as agricultural land; similarly, 48% of the workforce is based on agriculture (Central Intelligence Agency).

The typical Kyrgyz family consists of grandparents, parents, and children. It is typical for Kyrgyz individuals to live with their parents until they marry. In urban areas, the desired family size is four, however, that is much higher in rural areas. The fertility rate in Kyrgyzstan is 2.52 (World Bank Open Data). Nomadic Kyrgyz traditionally live in yurts, a form of a tent that can easily be moved. In urban areas, many people live in Soviet-style apartment blocks, and nearly 70% of the total population either

lives in substandard homes or is homeless (Habitat for Humanity Great Britain). It is not unusual for three generations to be crowded in a single room with no heating, and much of the country uses solid fuel as a heating source to compensate.

### **3. Dietary Deficiencies and Malnutrition**

The modern Kyrgyz diet consists of numerous starches and meat, primarily lamb, horse, and yak. Most foods are boiled or fried, and much of their diet is high in cholesterol. Cash crops such as wheat, barley, maize, and potatoes are also commonly found in their diet. The traditional diet, however, consisted of low-fat foods, complex carbohydrates, and fiber. The traditional nomad's diet also contained *kymz* (fermented horse milk) and other fermented foods, which have been shown to decrease the risk for cardiovascular disease. For the urban populations in Bishkek and Osh, there is a rich culture of street food from the bazaars and markets, and it has been historically an important source of nourishment for the population. However, much of the food contains high levels of trans fat and sodium, and industrially produced trans fat and sodium have contributed to the increased risk of cardiovascular disease in the country.

The coexistence of undernutrition, over nutrition, and micronutrient deficiency is the triple burden of malnutrition in Kyrgyzstan. Malnutrition and micronutrient deficiency are the bigger problems due to their effects. Currently, two out of five children in Kyrgyzstan between the ages of six and twenty-three months old do not meet the minimum diet diversity (UNICEF). The malnutrition rates correspond heavily with the child mortality rates, as 22% of child mortality cases result from poor nutrition (UNICEF). The mortality rate in Kyrgyzstan is 60 which is the highest rate of maternal mortality rate in the European region (World Bank Open Data). Maternal mortality is also heavily influenced by nutrition, specifically anemia, preterm labor, and preeclampsia, some of which are due to inadequate health care.

While Kyrgyzstan has free universal health care, it is inadequate because medical personnel are not well-trained. Medical supplies, pharmaceuticals, and equipment are also insufficient, and facilities are generally inadequate and unsanitary. There is also a scarcity of vaccines, so increased likelihood of measles and diphtheria. Virtually the only available medicines are available in bazaars.

Currently, the country is on track to meet the targets for stunting and wasting. However, no progress has been made to meet the exclusive breastfeeding target, reduce anemia among women of reproductive age, and reduce the iodine deficiencies among children. There is a lack of awareness of these potential health concerns regarding nutrient deficiencies. Functional consequences of anemia can include impairment of the cardiovascular system, limitation of productivity, a higher incidence of low birth rate, premature delivery, and an increase in maternal mortality. Furthermore, iodine deficiencies are the leading cause of preventable mental disabilities. Meeting the exclusive breastfeeding target will effectively help reduce iodine and iron deficiencies in children.

### **4. Solutions and Recommendations**

In order to reduce micronutrient undernutrition rates, there must be a combination of multiple solutions, including dietary intervention, supplementation, biofortification, and food fortification. Currently, there are some programs in place aimed at reducing the malnutrition rates; one of them is the USAID-funded

cooperative called Strengthening Partnerships, Results, and Innovations In Nutrition Globally (SPRING), which ran from 2012 to 2018. The program sought to improve the nutritional status of women and children under two and women of reproductive age through evidence-based practices. SPRING was tailored to the Kyrgyz culture and society, including early initiation of breastfeeding, targeting women and children in the first 1,000-day window of opportunity, and dietary diversity throughout the year. SPRING has worked with 6 raions and townships in the Naryn Oblast and 11 townships in the Jalalabad Oblast, which are more rural and smaller compared to the other oblasts.

SPRING heavily focused on education and intervention as they trained 1,200 healthcare workers to be able to give high-quality nutrition counseling to their patients (USAID). They also mobilized community activists to reach pregnant and lactating women and children younger than two years with key nutrition and hygiene information by conducting household visits and community meetings every month. They had 2,000 activists reach over 21,000 women and 7,500 children from about 4,000 households in their targeted program areas (USAID). SPRING was able to reach the number of people they did in Naryn and Jalalabad through social media, television programs, and journalism along with partnerships with the Ministry of Health, Ministry of Agriculture, and Ministry of Education.

Education is key when helping promote key nutrition information and the practice of exclusive breastfeeding. Exclusive breastfeeding for at least six months followed by continued partial breastfeeding in the second year of life is the most effective way of ensuring child health and survival. It provides newborns with vital nutrients and vitamins as well as antibodies that help decrease the child mortality rate, which is currently 18 deaths per 1,000 live births, and the stunting rate (World Bank Open Data). Breastfeeding helps save low income mothers from buying formula, and thus that money can be used to buy more food for the family. SPRING did a great job at implementing successful education programs in both Naryn and Jalalabad, but a downfall is that the program ended after seven years. So, it is hard to say if outreach increased or not. Currently, only 38% of children are exclusively breastfed from 4 to 6 months in Kyrgyzstan (UNICEF). In order for malnutrition rates in Kyrgyzstan to go down, education programs on exclusive breastfeeding like the ones implemented by SPRING need to be available in all eight oblasts, as they have been shown to be effective.

Kyrgyzstan should create a substantial investment in policies and programs to improve exclusive breastfeeding outcomes. Programs to promote breastfeeding require the commitment of the Kyrgyz government alongside support from a variety of ministries including health, education, and the judiciary. Promotion of breastfeeding via mass media, including TV, social media, advertisements, and newspapers has been shown to help increase rates of exclusive breastfeeding in countries like Jamaica and Colombia. This program specifically targeted two areas through mass media, and they should upscale their mass media approach to meet the needs of the whole country. Legal reforms would also be beneficial. For example, the regulation and packaging of milk substitutes should be regulated. Along with a mass media and legal approach, outreach in rural communities through instituting community educational programs would benefit rural populations. Providing possible financial incentives from the government for women to attend these education classes would help the message reach a bigger audience. Because the average monthly salary for a Kyrgyz worker is \$300 USD, the financial incentive they could provide would not have to be a great amount, thus keeping the solution relatively inexpensive for the government. Research shows “greater household food insecurity is associated with a reduced volume of breast milk intake

among infants” (Dinour, Lauren M., et al.). This means that a financial incentive could give families more money to purchase food, thus in theory allowing there to be a higher yield of breast milk from the mother. It is imperative that the Kyrgyz government allocate funds to financial incentives, as the money would lessen food insecurity in families. This would consequently lessen the malnutrition rates, as mothers will have nutritious food to eat and be able to pass along health and nutritious breast milk to their children.

Another program piloted by UNICEF in partnership with the Ministry of Health and other partners that has been deemed as a low-cost, effective way to help fight micronutrient deficiencies in children is providing children with vitamins and minerals through a micronutrient powder called Gulazyk. Gulazyk was initially piloted in the Talas Oblast, where anemia rates fell 26% within the year 2012 (UNICEF). Since then, it has been scaled up across the whole country, reaching over 70% of children under the age of two (UNICEF). Gulazyk has been extremely helpful in decreasing anemia. Still, it would be insufficient for decreasing anemia in children due to the growing availability of fast food and worsening food insecurity due to the COVID-19 pandemic and the Russia-Ukraine war.

UNICEF also supports a flour fortification program aimed at improving legislation and raising awareness of the benefits of consuming enriched food products. Flour fortification is one of the cheapest ways to prevent iron, zinc, and folic acid deficiencies. Due to their advocacy, large mills in Kyrgyzstan have been obliged by law to fortify flour with folic acid and other vitamins and minerals since 2009. However, the country has many mills and the law is difficult to enforce, especially in rural areas. Flour is also imported from Kazakhstan and Russia, where fortification is not done. In these smaller rural towns, some flour sellers don't adhere to the Kyrgyz law that requires flour fortifications. Driving the flour in from other parts of Kyrgyzstan is also expensive due to poor infrastructure and supply chain shortages resulting from the pandemic. Community advocacy groups such as the Civil Society Alliance have helped combat prices in small rural villages by creating workshops to help community members advocate for themselves. But, the Kyrgyz government should also create incentives to motivate flour mills, and allow for government subsidies if they fortify their flour and install random monthly checks to see if they adhere to this policy. This potential fix could increase the number of mills that fortify their flour for a relatively inexpensive amount.

Biofortification has also been proven to help micronutrient undernutrition. Biofortification is a strategy that uses plant breeding techniques to produce food crops with higher micronutrient levels, and it does not rely on food processing or milling like food fortification to incorporate nutrients. Biofortification has the potential to be used in maize, wheat, beans, and rice, all of which are prevalent in Kyrgyz diets. Biofortification would allow seeds to go right to the farmer with no need for further processing. Along with the nutrient benefits, biofortified food can also nourish depleted soils and help increase crop yields. One shortcoming of biofortified food is that it can not provide as high levels of supplementation as food fortification alone; consequently, multiple interventions must be used. There is also the issue of passing legislation to regulate food safety and making sure food is labeled as being transgenic. Even though there are multiple hoops to jump through, biofortification is a good option when paired with other methods to help with malnutrition

Due to the fact that micronutrient powders and flour fortification are inadequate when pandemics and conflicts arise, a more permanent solution is needed. One Canadian researcher, Dr. Christopher Charles,

inspired by previous work that showed cooking in cast iron pots increased the level of iron in foods, decided to create a lump of iron that can be placed in pots. His invention, the Lucky Iron Fish, when used every day in the correct way, can provide 75% of an adult's daily recommended intake of iron (Lucky Iron Fish). In one province in Cambodia, trials on several hundreds of villagers showed that nearly half of those who took part were no longer anemic after one year. The Lucky Iron Fish, not much larger than a coin, is worth five years' worth of iron supplements and is an inexpensive solution. The Lucky Iron Fish raises money directly and works with NGOs across the world, such as CARE, World Vision, and World Central Kitchen. Unfortunately, no one is addressing this need in Kyrgyzstan. So, an NGO already working in Kyrgyzstan such as the Aga Khan Foundation could be enlisted to help distribute the Lucky Iron Fish in Kyrgyzstan. Much of the Kyrgyz people's food is boiled. So, from a cultural standpoint, this solution would stick and help improve anemia in Kyrgyz communities. Unlike supplements, the Lucky Iron Fish is a permanent solution that would not be affected by supply chain shortages due to the Russia-Ukraine conflict or COVID-19.

In order to end malnutrition and micronutrient deficiencies in Kyrgyzstan, a multitude of solutions must be used all the while taking into account the urban and rural divide and the lingering effects of the pandemic, and the current Russia-Ukraine conflict. Food insecurity and malnutrition rates are heavily tied, and by implementing programs to tackle malnutrition, the country will also see a decrease in rates of food insecurity. Most solutions like supplementation, food fortification, and biofortification can be heavily impacted due to changes in the economy and government. Fortunately, more permanent solutions such as educational programming to build a culture of exclusive breastfeeding and innovations like the Lucky Iron Fish are on the rise. Together these solutions should help the women and children of Kyrgyzstan live happier, healthier, and longer lives.

## Bibliography:

- “2 out of 5 Children in Kyrgyzstan between 6 and 23 Months Old Do Not Receive the Minimum Diet Diversity.” *UNICEF*,  
<https://www.unicef.org/kyrgyzstan/press-releases/2-out-5-children-kyrgyzstan-between-6-and-23-months-old-do-not-receive-minimum-diet>.
- “Activism Brings Fortified Flour to Suusamyр in Kyrgyzstan -.” *Working Together in the Fight against Malnutrition in All Its Forms*, 8 Mar. 2019,  
<https://scalingupnutrition.org/news/civil-society-helps-to-brings-fortified-flour-to-suusamyр-in-kyrgyzstan/>.
- Chessa K. Lutter, Iron Deficiency in Young Children in Low-Income Countries and New Approaches for Its Prevention, *The Journal of Nutrition*, Volume 138, Issue 12, December 2008, Pages 2523–2528, <https://doi.org/10.3945/jn.108.095406>
- Dinour, Lauren M., et al. “The Role of Prenatal Food Insecurity on Breastfeeding Behaviors: Findings from the United States Pregnancy Risk Assessment Monitoring System - International Breastfeeding Journal.” *BioMed Central*, BioMed Central, 19 Apr. 2020,  
<https://internationalbreastfeedingjournal.biomedcentral.com/articles/10.1186/s13006-020-00276-x#:~:text=Background.by%20negatively%20affecting%20maternal%20employment>.
- “Global Nutrition Report | Country Nutrition Profiles - Global Nutrition Report.” *Home - Global Nutrition Report*,  
<https://globalnutritionreport.org/resources/nutrition-profiles/asia/central-asia/kyrgyzstan/>.
- “Housing Poverty in Kyrgyzstan: Rebuilding Safe Homes.” *Habitat for Humanity GB*, Habitat for Humanity Great Britain, <https://www.habitatforhumanity.org.uk/country/kyrgyzstan/>.
- “In Kyrgyzstan, UNICEF Bolsters Flour Fortification to Prevent Birth Defects | UNICEF.” *UNICEF*,  
<https://www.unicef.org/stories/kyrgyzstan-unicef-bolsters-flour-fortification-prevent-birth-defects#:~:text=Fortification%20is%20the%20law%20%E2%80%93%20in%20principle&text=Following%20UNICEF%20advocacy%2C%20large%20mills,where%20fortification%20is%20not%20done>
- “Integrating Nutrition Programmes in Primary Care in Kyrgyzstan .” *Integratedcare4people.Org*, IPCHS:

- Integrated People-Centred Health Services Practices, 2016,  
<https://www.integratedcare4people.org/practices/393/integrating-nutrition-programmes-in-primary-care-in-kyrgyzstan/>.
- Jardine, Bradley. “Russia’s War in Ukraine Spells Disaster for Central Asia | Time.” *Time*, Time, 11 Mar. 2022, <https://time.com/6156524/russia-ukraine-central-asia-impact/>.
- “Kyrgyz Republic | Data.” *World Bank Open Data*,  
<https://data.worldbank.org/country/kyrgyz-republic>
- “Kyrgyz Republic | World Food Programme”, *UN World Food Programme (WFP)*  
<https://www.wfp.org/countries/kyrgyz-republic>
- “Kyrgyzstan | LandLinks.” *LandLinks*, USAID,  
<https://www.land-links.org/country-profile/kyrgyzstan/#summary>.
- “Kyrgyzstan - Health.” *Country Studies*,  
<http://countrystudies.us/kyrgyzstan/16.htm#:~:text=Health%20Care%20System,as%20medical%20clinics%20and%20hospitals>.
- “Kyrgyzstan - The World Factbook.” *Central Intelligence Agency - CIA*,  
<https://www.cia.gov/the-world-factbook/countries/kyrgyzstan/>.
- “Kyrgyzstan Enacts Law on Flour Fortification to Fight ‘hidden Hunger’ - Kyrgyzstan | ReliefWeb.” *ReliefWeb*, OCHA: United Nations Office for the Coordination of Humanitarian Affairs,  
<https://reliefweb.int/report/kyrgyzstan/kyrgyzstan-enacts-law-flour-fortification-fight-hidden-hunger>.
- “Kyrgyzstan (KGZ) Exports, Imports, and Trade Partners | OEC - The Observatory of Economic Complexity.” *OEC - The Observatory of Economic Complexity*,  
[https://oec.world/en/profile/country/kgz#:~:text=Exports%20The%20top%20exports%20of,%2C%20and%20Turkey%20\(%2487M\)](https://oec.world/en/profile/country/kgz#:~:text=Exports%20The%20top%20exports%20of,%2C%20and%20Turkey%20(%2487M)).
- “Our Story .” *Lucky Iron Fish*, <https://luckyironfish.com/pages/about-us>.
- Otunchieva, A.; Borbodoev, J.; Ploeger, A. The Transformation of Food Culture on the Case of Kyrgyz Nomads—A Historical Overview. *Sustainability* 2021, 13, 8371.  
<https://doi.org/10.3390/su13158371>
- Roxy, Philippa. “Why an Iron Fish Can Make You Stronger - BBC News.” *BBC News*, BBC News, 17 May 2015, <https://www.bbc.com/news/health-32749629>.
- Sant-Rayn, et al. “Control of Iron Deficiency Anemia in Low- and Middle-Income Countries | Blood | American Society of Hematology.” *American Society of Hematology*, Oxford University Press, 4 Apr. 2013,  
<https://ashpublications.org/blood/article/121/14/2607/31112/Control-of-iron-deficiency-anemia-in-low-and>.
- “SPRING in the Kyrgyz Republic: Evidence of Significant Improvement in Nutrition Practices | SPRING.” *SPRING*, USAID,  
<https://www.spring-nutrition.org/publications/briefs/spring-kyrgyz-republic-evidence-significant-improvement-nutrition-practices>.
- Thelwell, Kim. “Combating Iron Deficiency in Developing Countries - The Borgen Project.” *The Borgen Project*, 24 July 2019, <https://borgenproject.org/iron-deficiency-in-developing-countries/>.
- “WHO/Europe | Widely Available Foods May Pose Major Health Risk in Kyrgyzstan.” *WHO/Europe* |

*Home,*

<https://www.euro.who.int/en/countries/kyrgyzstan/news/news/2017/11/widely-available-foods-may-pose-major-health-risk-in-kyrgyzstan>.