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## Engaging Local Ideas about Healthy Eating to Combat Protein-Energy Malnutrition in West Africa: The Centrality of Mothers to Kwashiorkor Prevention in Ghana

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Engaging Local Ideas about Healthy Eating to Combat  
Protein-Energy Malnutrition in West Africa:  
The Centrality of Mothers to *Kwashiorkor* Prevention in Ghana

A thesis submitted in partial fulfillment of the requirement for the degree of  
Bachelors of Arts in Public Health: Medicine and Culture in the Developing World  
with a Focus on Africa and Latin America from  
The College of William and Mary

by

E. Allison Honenberger

Accepted for \_\_\_\_\_  
(Honors, High Honors, Highest Honors)

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‡ For my mother

Is not this the kind of fasting I have chosen:  
to loose the chains of injustice  
and untie the cords of the yoke,  
to set the oppressed free  
and break every yoke?

Is it not to share your food with the hungry  
and to provide the poor wanderer with shelter—  
when you see the naked, to clothe him,  
and not to turn away from your own flesh and blood?

Then your light will break forth like the dawn,  
and your healing will quickly appear;  
then your righteousness will go before you,  
and the glory of the Lord will be your rear guard.

Then you will call, and the Lord will answer;  
you will cry for help, and he will say: Here am I.  
"If you do away with the yoke of oppression,  
with the pointing finger and malicious talk,

and if you spend yourselves in behalf of the hungry  
and satisfy the needs of the oppressed,  
then your light will rise in the darkness,  
and your night will become like the noonday.

The Lord will guide you always;  
he will satisfy your needs in a sun-scorched land  
and will strengthen your frame.  
You will be like a well-watered garden,  
like a spring whose waters never fail.

Your people will rebuild the ancient ruins  
and will raise up the age-old foundations;  
you will be called Repairer of Broken Walls,  
Restorer of Streets with Dwellings.

Isaiah 58: 6-12

## Methods

With my eyes closed and my ears catching her voice on the cellular phone, I feel the jostle of those red dirt roads, see the thin dark limbs disappear between the maize shoots that stand like sentinels around cinderblock houses. I can almost hear the drums crescendo in the distance, the rhythm resounding in my chest, but it is only my heart. It dances and weeps within me as she tells me her story and speaks reverently of African mothers. She is one of them. She is one who has gone without that her children may survive and know a life richer than her own.

After dozens of interviews with West Africans such as the one with the Sierra Leonean mother mentioned above, after more than a hundred books and articles from Swem Library and Interlibrary Loan and after five weeks in Ghana, I emerge with a deep respect for West African mothers and a confidence in their capacity to effect lasting change in the battle against childhood malnutrition. Through this dialogue, reading and field work, I have come to focus on *kwashiorkor*, a distinct form of Protein Energy Malnutrition (PEM) that primarily affects children between the ages of six-months and four-years who do not get enough protein in their diet.

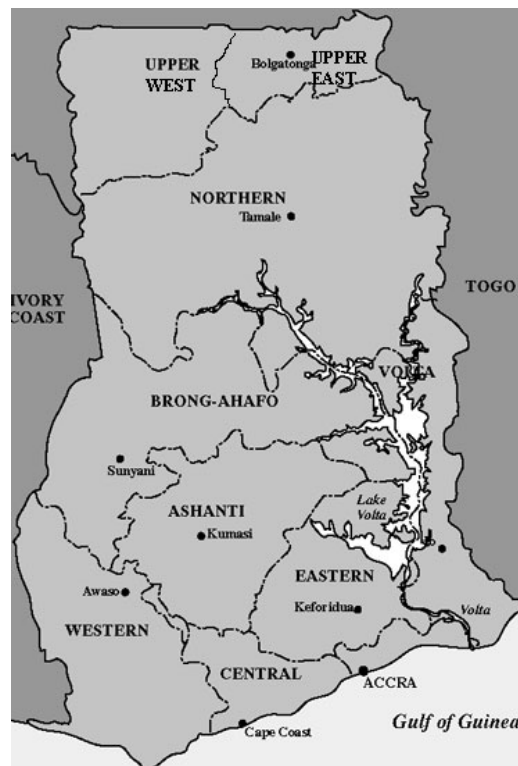
Outsiders seeking to reduce the degree of malnutrition in sub-Saharan Africa will do well to listen to these mothers. International aid workers must focus their public health campaigns to address the problems which locals identify as paramount and collaborate with local experts – including these mothers. In this way they gain an understanding of the context of *kwashiorkor* and a greater ability to develop effective and sustainable strategies that are relevant to the lives of those they hope to help.



West Africans are diverse, and their experiences with *kwashiorkor* weave an elaborate tapestry of heartache and hope. Through this diverse tapestry run more than a few common threads – threads of poverty, corruption, disenfranchisement, and misunderstanding, as well as threads of ingenuity, altruism, empowerment and knowledge.

## Field Work

“Akwaaba!” With my first breath of Ghanaian air, this was the word I saw – painted in large colorful letters on the exterior airport wall. “Welcome!” The spirit of that earliest greeting would continue to grow over the next five weeks, and my desire to return would linger long after leaving. Ghana quickly became for me a home away from home.



Map 1: Political map of Ghana showing the country's ten regions<sup>1</sup>

<sup>1</sup> Map from [www.ghana.gov.gh/files/images/Ghana\\_map\\_0.jpg](http://www.ghana.gov.gh/files/images/Ghana_map_0.jpg)

I spent those five weeks in three of the southern regions of Ghana: the Greater Accra, Volta, and Central Regions. Based out of the capital cities in those regions, I had the opportunity to work alongside Ghanaians in several faculties and glean wisdom from their knowledge of *kwashiorkor* on a local and national scale. During my first week in the country's capital of Accra, I visited two teaching hospitals: Narh-Bita in Tema, and Korle-Bu in Accra. At the first, I interviewed a nurse, who was also the mother of a two-year-old boy whom she carried on her hip while working the evening I visited.



**Image 1: Interviewing a Nurse at Narh-Bita Hospital in Tema, Ghana**  
Photo taken by Alli Honenberger

Through this conversation I first learned of Ghana's community health program, an extensive system in which community nurses are expressly trained to meet the health needs of those living in rural Ghana. This nurse also explained the primary cause of *kwashiorkor* in Ghana, namely pre-mature weaning, a story that would become familiar as I heard it repeated time and again throughout my

research. At Korle-Bu, I spoke with a resident doctor as she led my colleagues and me on a tour of the children's ward. She expressed her frustrations with the hospital's facilities, admitted the need for more funding and medical professionals, and revealed what she believed to be the greatest weaknesses of the nation's medical education and health care systems.



**Image 2: Looking down on Korle-Bu Hospital from a window in the Children's Ward**  
Photo taken by Alli Honenberger

During my time in the capital, I interviewed two more knowledgeable Ghanaian women. One was the current coordinator of the nurses' training program at Korle-Bu, a woman who once did nursing herself. She possessed great insight into the attitudes and behaviors of Ghanaian mothers who bring their children to the hospital for severe malnutrition, of which *kwashiorkor* is a principal form. The other was our host, a mother of four girls who fixed all of our meals and prepared food for her family year round. Every moment - whether it be spent driving through the city in daylight or moonlight, wandering among the vendors on market day, or talking with strangers and acquaintances - provided an opportunity to learn about the Ghanaian way of life, the health care and education systems, as well as the local ideas about *kwashiorkor* and healthy eating.

After our time in Accra, I spent the majority of the next four weeks working with Life for the Living Medical Clinic (Lilimed),<sup>2</sup> a locally established and managed mobile clinic out of Ho, Volta Region. On our daily excursions to rural villages, I worked with a team of Ghanaians and four other W&M students to provide medicines and medical advice to people in communities with limited access to urban health centers. Essentially serving as a triage nurse, I got to interact with many patients and ask them about their recent ailments, clinical history, and most recent meal. This communication, often times facilitated by a translator, granted me insight into local perspectives and practices.

The Ghanaian doctors and volunteers with whom I served also informed my understanding of the Ghanaian health care system and the role of mothers in preventing kwashiorkor. The doctor who volunteered with the clinic specialized in pediatrics and worked at the Volta Regional Hospital when not traveling to communities with the Lilimed team. Taking an afternoon to tour that hospital with our doctor friend, I learned more about the obstacles facing Ghanaian mothers who try to maintain their own nutritional health and that of their families. This physician also spoke about the limitations felt by him and his patients as a result of inadequate resources. Following him through the halls of the abandoned neonatal ward, in non-use due to insufficient staffing, I wondered where the infants unfit to enter the outside world would go.

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<sup>2</sup> More information about the clinic can be found at <http://lilihuc.org/index.html>. One of the members of our W&M team designed this website in partnership with the Ghanaian clinic directors. They were able to launch it during our time in the Volta Region.



**Image 3: The abandoned neonatal wing of the Volta Regional Hospital, in non-use due to low-staffing.**  
Photo taken by Alli Honenberger

In traveling to Ghana, I expected to have my heart wrenched as I encountered dozens of children with distended bellies, skeletal limbs, rounded cheeks, and flaky scalps, the classic signs of *kwashiorkor*. In fact, we saw very few sickly children at the clinic, and even fewer at the schools where we taught for one week of the four. Instead, hoards of healthy school children would gather around us *obrunis*, or “white people,” as we packed up at the end of each work day. Smiling and giggling, they would entice us to join their circle and teach them our songs, classics like hokey pokey and the crazy chicken.

It wasn't until the last week that we met Elolo. We arrived at the orphanage with a gift of school supplies and second-hand clothing. Before setting out to play soccer and build Playdough creations with the children, the overseer of the orphanage passed around a photograph. It was of an infant, lying lethargically on a

stone floor. His emaciated limbs folded over his body as he lay to one side with swollen abdomen resting on the ground. He was so severely malnourished that his external anal sphincter had reversed itself and visibly protruded from the body. As we solemnly considered the picture in turn, the matron introduced us to Eलो, a healthy, but quiet boy at her knee. She told us the sad story of his past, as we tried not to stare at this seven-year-old boy who looked barely four. Then she shared the happy story of his rescue, and we sensed and shared in her hope for his future. Eलो was a survivor of *kwashiorkor*.



**Image 4: Eलो, a boy once suffering from *kwashiorkor*, now plays with other children in the orphanage courtyard.**

Photo taken by Alli Honenberger

## Dialogue and Reading

Scholastic exploration of the history and physiology of *kwashiorkor* come alive with the insight of West African interviewees. Their abundant wisdom, substantiated by academic literature, offers invaluable perspective on the disease's manifestations in West African life. The African voice holds the power to stir up solidarity, purpose, and hope in those choosing to enlist in the battle against protein-energy malnutrition. By listening to the experiences of those who daily live with the reality of *kwashiorkor*, Westerners have their eyes opened. The knowledge of *kwashiorkor* foreigners can derive from books serves to fill in the gaps.

# Chapter 1: The Battle against Childhood Malnutrition

## Listening to African Voices

Ghanaian mothers are central to the development, treatment, and prevention of *kwashiorkor*, and thus critical to the on-going battle against protein energy malnutrition. Their voices, along with those of all they have influenced should be heard and revered in future campaigns to improve the nutritional health and welfare of Ghanaian youth. Before endeavoring to design public health campaigns in the developing world, foreigners should seek to understand the political, economic, biological, and social context of the suffering they aim to alleviate. As these women face political, economic, and social challenges, foreign agencies should partner with them to implement effective campaigns against *kwashiorkor*. International aid workers should actively seek the experiential wisdom of Ghanaian mothers to better understand the disease's context and endorse successful solutions. To effectively combat *kwashiorkor* in Ghana, outsiders must understand local perspectives, learn from local experiences and recognize the significance of a mother's role in improving the nutritional health of her children.

For decades, foreigners in the public health sphere have tried to break the cycle of poverty and childhood malnutrition. The majority of interventions have emphasized economic development and food aid, two strategies prone to promoting a culture of dependence. The goals of combating malnutrition and poverty should be local sustainability and prevention rather than endless foreign intervention and treatment. The implementers of future campaigns can only achieve the former



objectives through listening to West African voices. The most powerful agents of *kwashiorkor* prevention in Ghana are mothers. They possess a deep determination to see Ghanaian children free from the grips of this debilitating malnutrition disease. Their intimate knowledge of the customs and circumstances affecting the disease's development is invaluable. Outsiders' ignorance of this culture and context leads to ineffective programs against *kwashiorkor*. In the years ahead, the eyes and ears of Westerners will be their greatest asset. The hearts, hands, and minds of the people they aim to help will be far more valuable than their own. By listening to West Africans' experience throughout the social, political and medical history of *kwashiorkor* in Ghana, compassionate foreigners can establish vital partnerships with local people to prevent PEM. With this valuable insight, foreign agencies can approach the problem of malnutrition with purpose and perspective. Through continued sponsorship of programs aimed at preventing childhood malnutrition in Ghana, the international community has an opportunity to empower Ghanaian mothers in the journey toward a sustainable solution.

### **Protein- Energy Malnutrition**

Protein-energy malnutrition, or protein deficiency, plagues many families in the developing world, while most citizens of the industrialized world are unacquainted with its immense cost to human health and quality of life. The world's poor, particularly women and children, suffer most from protein malnutrition. Victims of protein malnutrition have the potential to develop severe medical conditions. Prolonged periods of insufficient dietary protein compromise organ function, reduce vitality, and weaken the immune system. Physicians classify

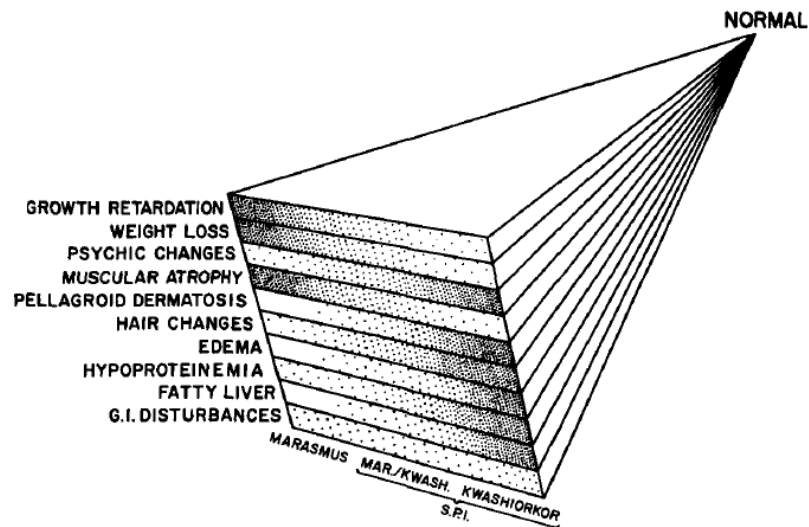
protein-energy malnutrition (PEM) as either primary or secondary PEM. While primary PEM develops after a period of insufficient protein or calorie intake, secondary PEM is typically the result of a person's inability to break down protein adequately. Secondary PEM is more common among people in industrialized nations, particularly the elderly and chronically ill. Pregnant mothers and children in developing countries constitute the majority of primary PEM victims.

The two prevailing forms of childhood malnutrition, seen principally in the developing world, are *marasmus* and *kwashiorkor*. *Marasmus* is characterized by general wasting, an indicator of acute malnutrition, caused by partial or severe starvation. *Kwashiorkor*, on the other hand, displays a complex array of symptoms resulting from insufficient protein intake. Stunting, or the evidence of chronic malnutrition, is a distinguishing sign of *kwashiorkor*. Children with diets excessively high in starchy foods and extremely low in protein are at the greatest risk for developing *kwashiorkor*.

International aid workers and physicians generally identify *kwashiorkor* via two methods: anthropometric analysis and clinical diagnosis. When the only visible symptom of malnutrition displayed in a young patient is inadequate growth, physicians can employ anthropometric measurements to assess the child's nutritional health. These measurements include height-for-age (HFA, or stunting), weight-for-age (WFA, or underweight), weight-for-height (WFH, or wasting), and mid-upper arm circumference (MUAC). The Food and Agriculture Organization (FAO), World Health Organization (WHO) and other international agencies define stunting and wasting as two standard deviations below the standard, or average,

height-for-age and weight-for-height, respectively. Severe levels of these conditions fall three standard deviations below the average. Physicians find anthropometric methods important for the early diagnosis of *kwashiorkor* in identifying at-risk youth before they exhibit the clinical symptoms of severe PEM.

Children in the more advanced phases of *kwashiorkor* encounter debilitating physical and psychological challenges as they fail to grow and develop properly. The physical symptoms they experience include: alterations in skin and hair pigmentation, edema, or severe swelling, fatty degeneration of the liver and anemia, or low red blood cell count, and low serum protein. Extreme irritability and lethargy represent the two most common psychological indicators of *kwashiorkor*. Patients with *kwashiorkor* fail to meet the nutritional requirements for maintaining basic energy production, immune system function, and physical activity.<sup>3</sup>



**Figure 1: Diagram of relationship between *kwashiorkor* and *marasmus* symptoms<sup>4</sup>**

<sup>3</sup> Jan Kuhanen, "Poverty and wealth in traditional African societies: Considerations regarding wealth, well-being, and nutrition in the Ganda and Nyoro societies, c 1800 to 1875," *Nordic Journal of African Studies* 9, no. 1 (2000): 70-95.

<sup>4</sup> Béhar, Moisés et al., "Principles of treatment and prevention of severe protein energy malnutrition in children (*kwashiorkor*)," *Annals of the New York Academy of Sciences* 69, no. 954 (1958): 955.

People with *kwashiorkor* also experience long term effects such as stunted growth and neurological deficits. Experts believe that the time between conception and age two, when an infant depends on its mother for survival, is the period in which malnourished children suffer the most serious and irreversible damage to their nervous system.<sup>5</sup> In particular, stunting, defined as below average height-for-age, has been associated with lower IQs and fewer years of school for children. In adults, stunting often translates to lower productivity and income.<sup>6,7</sup> Despite these incapacitating outcomes, *kwashiorkor* victims are not without hope. Parents and physicians can effectively treat children with *kwashiorkor* through a careful rehabilitation regimen of carbohydrates, vitamins, fats and proteins. If care takers begin treatment in the early stages of *kwashiorkor*, they can restore a malnourished child to health in a matter of weeks. Treatment of *kwashiorkor* in the later stages is generally life-saving, although the child may experience permanent retardation of physical and mental development. When left untreated, *kwashiorkor* is fatal.<sup>8,9</sup>

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<sup>5</sup> Yves Willemot and Brahim O. Isselmou, "Funds needed urgently to fight malnutrition in mauritania," in *UNICEF* [database online], (Brakna, Mauritania: UNICEF, 2006) Available from: [http://www.unicef.org/nutrition/mauritania\\_33777.html](http://www.unicef.org/nutrition/mauritania_33777.html)

<sup>6</sup> Steven M. Fishman et al., *Childhood and Maternal Underweight*, in vol. 1 of *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors* (Geneva: World Health Organization, 2004), 39-162.

<sup>7</sup> Laura E. Caulfield et al., "Stunting, wasting, and micronutrient disorders," in *Disease Control Priorities in Developing Countries*, eds. Dean T. Jamison, Joel Breman and Philip Musgrove, (New York: Oxford University Press and The World Bank, 2006) 562-563.

<sup>8</sup> Cicely D. Williams, "A nutritional disease of childhood associated with a maize diet," *British Medical Journal* 8, no. 3 (1933): 426.

<sup>9</sup> MedlinePlus, "Kwashiorkor," *U.S. National Library of Medicine and National Institutes of Health*. Available from: <http://www.nlm.nih.gov/MEDLINEPLUS/ency/article/001604.htm>

Today approximately 10.8 million of the world's children die before their fifth birthday.<sup>10, 11</sup> More than half of them suffer from malnutrition.<sup>12</sup> This is a percentage unparalleled by any infectious disease since the Black Plague.<sup>13</sup> Experts assert that undernutrition is the single leading global cause of health loss, and while the number of underweight people has decreased for the majority of the world, they have increased in sub-Saharan Africa.<sup>14</sup> Of the nearly 11 million children in the world dying before the age of five, approximately one-third suffer from protein energy malnutrition, or PEM, while 15% of the 11 million live in Africa.<sup>15</sup>

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<sup>10</sup> Ulrich E. Schaible and Stefan H. E. Kaufmann, "Malnutrition and infection: Complex mechanisms and global impacts," *Public Library of Science* 4, no. 5 (2007): 806.

<sup>11</sup> World Health Organization. WHO and the millennium development goals. 2005. Available from: <http://www.who.int/mediacentre/factsheets/fs290/en/index.html>

<sup>12</sup> The five leading causes of death among children under the age of five are diarrhea, malaria, acute respiratory infections, measles, and neonatal disorders. More than half of childhood deaths are attributable to undernutrition, as indicated by low weight-for-height or weight-for-age, with the associated percentages for the leading causes: diarrhea (61%), malaria (57%), pneumonia (53%), and measles (45%). Robert E. Black, S.S. Morris, and J. Bryce, "Where and why are 10 million children dying every year?" *The Lancet* 361, no. 9376 (2003): 2226-34.

<sup>13</sup> Jean-Louis Sarbib, "Malnutrition hits economic growth," *BBC News: Business* (2006). Available from: <http://news.bbc.co.uk/2/hi/business/4767864.stm>

<sup>14</sup> Majid Ezzati et al., "Selected major risk factors and global and regional burden of disease," *The Lancet* 360, no. 9343 (2002): 1355.

<sup>15</sup> M. de Onis, C. Monteiro, J. Akre, and G. Clugston, "The world-wide magnitude of protein-energy malnutrition: An overview from the WHO global database on child growth," *Bulletin of the World Health Organization* 71, no. 6 (1993): 703.

| Neonatal, postneonatal, infant, child, and under-five mortality rates for the ten-year period preceding the survey, by background characteristic, Ghana 2003 |                         |   |  |   |  |
|--|-------------------------|---|--|---|--|
| Background characteristic  | Neonatal mortality (NN) | Postneonatal mortality <sup>1</sup> (PNN) | Infant mortality ( <sub>1</sub> q <sub>0</sub> ) | Child mortality ( <sub>4</sub> q <sub>1</sub> ) | Under-five mortality ( <sub>5</sub> q <sub>0</sub> ) |
| <b>Residence</b>   |                         |   |  |   |  |
| Urban  | 38                      | 17  | 55   | 40  | 93   |
| Rural  | 43                      | 27  | 70   | 52  | 118  |
| <b>Region</b>  |                         |   |  |   |  |
| Western  | 37                      | 30  | 66   | 46  | 109  |
| Central  | (37)                    | (13)                                      | (50)   | (41)  | (90)   |
| Greater Accra  | 29                      | 16  | 45   | 31  | 75   |
| Volta  | 44                      | 31  | 75   | 41  | 113  |
| Eastern  | 42                      | 22  | 64   | 33  | 95   |
| Ashanti  | 57                      | 22  | 80   | 40  | 116  |
| Brong Ahafo  | 36                      | 22  | 58   | 35  | 91   |
| Northern   | 38                      | 32  | 69   | 90  | 154  |
| Upper East   | 22                      | 11  | 33   | 48  | 79   |
| Upper West   | 62                      | 43  | 105  | 115   | 208  |
| <b>Mother's education</b>  |                         |   |  |   |  |
| No education   | 37                      | 29  | 66   | 63  | 125  |
| Primary  | 49                      | 27  | 76   | 48  | 120  |
| Middle/JSS   | 43                      | 18  | 60   | 34  | 92   |
| Secondary+   | (27)                    | (2)                                       | (29)   | (5)   | (34)   |
| <b>Wealth quintile</b>   |                         |   |  |   |  |
| Lowest   | 37                      | 25  | 61   | 70  | 128  |
| Second   | 40                      | 23  | 64   | 44  | 105  |
| Middle   | 49                      | 25  | 73   | 40  | 111  |
| Fourth   | 38                      | 28  | 66   | 45  | 108  |
| Highest  | 42                      | 15  | 58   | 33  | 88   |

Note: Rates based on 250 to 499 exposed persons are in parentheses.  
<sup>1</sup> Computed as the difference between the infant and neonatal mortality rates

**Figure 2: Early childhood mortality rates by socio-economic factors.<sup>16</sup>**

At the time of Ghana's independence in 1957, the estimated number of Ghanaian children dying before the age of five was 237 out of every 1,000 born. In 1996, the number had been reduced to 126 per 1,000. Today, the rate stands at approximately 115 per 1,000.<sup>17, 18</sup> As more than half of these deaths are associated with malnutrition, international aid workers continue to prioritize the battle against *kwashiorkor*.

<sup>16</sup> "Child and Infant Mortality," Chapter 8 in *Demographic and Health Survey 2003*, Ghana Statistical Service, Accra, Ghana. Available from: <http://www.docstoc.com/docs/3907228/INFANT-AND-CHILD-MORTALITY-Chapter-deals-with-levels-trends-and>

<sup>17</sup> Arjun Adlakha, "International population brief: Ghana," *US Department of Commerce: Bureau of the Census, IB/96-1* (1996), 1. Available from [http://www.census.gov/ipc/prod/ib96\\_01.pdf](http://www.census.gov/ipc/prod/ib96_01.pdf)

<sup>18</sup> Reliable and complete health statistics for non-industrialized nations are difficult to obtain.

## Kwashiorkor in Ghana

Throughout this battle, Ghanaian women have played a central role in the development, treatment, and prevention of *kwashiorkor*. Thus, it was fitting that the person who brought *kwashiorkor* into the light of Western medicine was a woman with an ear attuned to the experiences of Ghanaian mothers and a respect for local beliefs and practices. In 1933, Cicely Williams published the first paper on *kwashiorkor*, introducing the disease to the realm of colonial medicine. As a strong-willed and sensitive English woman practicing medicine in the Gold Coast (modern day Ghana), Williams faced strong opposition from British doctors and academics in the years following her publication. Entering the Colonial Medical Service in 1929, she specialized in maternal and child health as a Woman Medical Officer. She transcended the basic responsibilities outlined by her position and became an advocate for expanding and improving all infant medical services. Her desire to understand the Gold Coast people and communicate in their language set her apart from other physicians of the time. Her sensitivity to the struggles and successes of African mothers provided her with great insight into the manifestations of *kwashiorkor* in the Gold Coast.<sup>19</sup>

The clinical term Williams used to describe the disease in 1933, *kwashiorkor*, originated among the Gã-speakers of southeastern Ghana. During her first three years in the Gold Coast, Williams did not hear any of the African mothers mention this word. Historians speculate that the desperation and disgrace associated with

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<sup>19</sup> Jennifer Stanton, "Listening to the Gã: Cicely Williams' discovery of *kwashiorkor* on the gold coast," *Women and modern medicine* 61, eds. L. Conrad and A. Hardy, (Amsterdam: Rodopi, 2001), 149-171.

the label prevented Ghanaian women from colloquially discussing it. Literally translated, *kwashiorkor* means “the disease of the deposed child,” “the disease of the displaced child,” or “the disease of the first child when the next child is born.”<sup>20, 21</sup> Ghanaians still use this word to describe the fate of young children who either receive inadequate nutrients as infants when a mother dies in childbirth or of those who are prematurely weaned because a mother becomes pregnant while the child is still breastfeeding. In this way, the word’s meaning communicates the centrality of Ghanaian mothers to the development of *kwashiorkor*.

Beyond uncovering the local term for the disease, Williams also described the debilitating progression of *kwashiorkor* as she observed it in Gold Coast children between the ages of one and four. Williams draws attention to the prevalence of *kwashiorkor* in the early nineteenth century, suggesting that Ghanaian mothers of that time were familiar with the progression of “this well-marked syndrome.”<sup>22</sup> First, mothers would notice in their malnourished child slight swelling of the hands and feet coupled with mild skin discoloration. Then they would see black patches forming on the child’s wrists, ankles, knees, and elbows, which were once thought to be points of pressure or irritation from the jewelry commonly placed on Gold Coast infants. Mothers would then watch the discoloration spread from the areas around the joints to the remainder of the child’s body. As the patches thickened and crumpled, they would eventually peel away to leave soft, pink flesh beneath. At this

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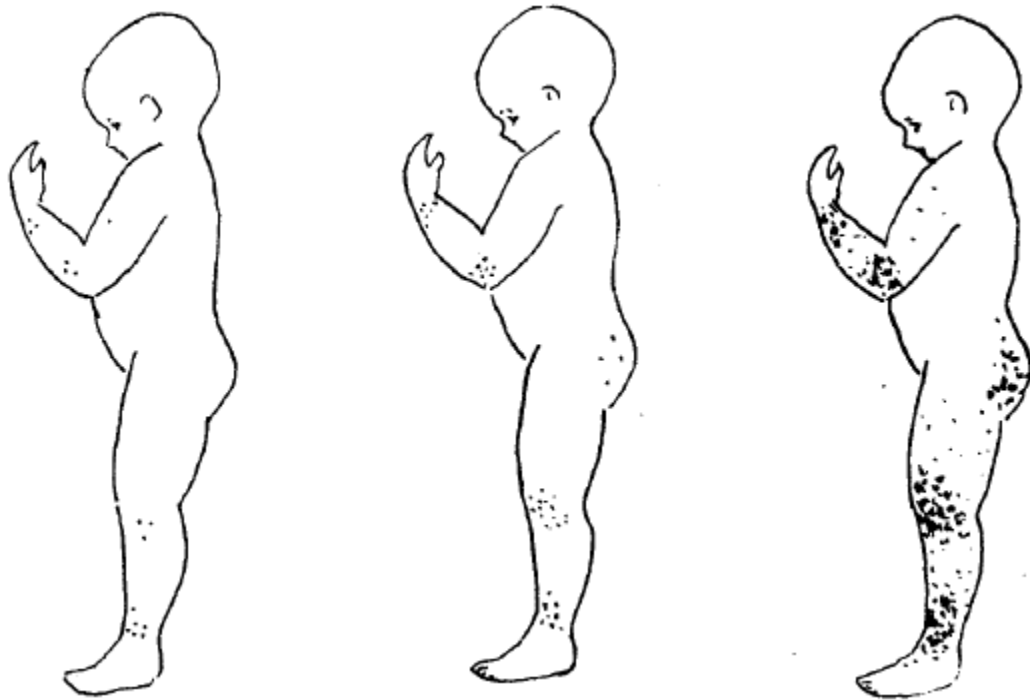
<sup>20</sup> Several translations, which have endured years of migration, external influence and scholarly investigation, remain in use today.

<sup>21</sup> Williams, *A nutritional disease of childhood associated with a maize diet*, 423-433.

<sup>22</sup> Williams, *A nutritional disease of childhood associated with a maize diet*, 423.



late stage the swelling would subside, leaving the skin as a collage of reddish brown unaffected areas, black patches of irritation, and raw flesh exposed by the peeling.<sup>23</sup>



**Figure 3: The spreading skin condition associated with *kwashiorkor*.<sup>24</sup>**

In addition to the physical signs of *kwashiorkor*, Ghanaian mothers observed disconcerting psychological changes in their children. As mentioned before, irritability and apathy are the two predominant temperaments associated with *kwashiorkor*, both of which compromise a child's ability to function and thrive. The challenges associated with extreme hunger and protein malnutrition affect every aspect of a child's life. Children become unusually irritable in the initial phases of the disease. Listless and lethargic, *kwashiorkor* victims are apt to lose motivation in their studies, lack the energy and strength to perform strenuous work, and assume a

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<sup>23</sup> Williams, *A nutritional disease of childhood associated with a maize diet*, 425-427.

<sup>24</sup> Williams, *nutritional disease of childhood associated with a maize diet*, 427.

depressed psychological state that hinders them from reaching their full potential. Researchers have shown that Ghanaian youth who suffer from severe PEM and the resultant apathy are less likely to complete secondary school. Without this degree and a critical level of education, adolescents in West Africa have a limited ability to pursue their dreams, earn a livelihood, and ultimately provide for a family.<sup>25</sup>

The centrality of mothers to the nutritional health of their children is evident in the physiological development and progression of *kwashiorkor*. Williams notes an intimate link between the development of *kwashiorkor* in her young African patients and the health and actions of Gold Coast mothers. More than half a century after Williams' work in the Gold Coast, poverty, premature weaning, and deficient weaning foods still rank among the leading causes of *kwashiorkor*. Thus mothers continue to serve as powerful agents for the sustainable prevention of PEM. While widespread poverty is a far-reaching and immensely complex problem that is beyond a single person's ability to eradicate, the modification of weaning practices and food preparation fall within a mother's capacity to control. Ghanaian women have demonstrated this capacity through their resourceful manipulation of maize-based weaning foods.

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<sup>25</sup> One Nigerian student shared his observations on the "impossibility" of providing for a family without a high school or college diploma. In his opinion, education is critical to every African child's success. In response to a question about the importance of education, he resolutely declared, "If you don't have an education, you're not going to get paid well. There are no two ways about it." When later asked about the best method for combating malnutrition in West Africa, he replied, "You can never beat the power of education, first of all."

## Maize in Ghana

### The Local Impact of Foreign Action

Westerners' distribution of food to the people of West Africa has not always been prompted by altruism. The European introduction of crops to the people of the Gold Coast colony in the early sixteenth century did not arise out of a desire to see malnourished Africans overcome disease and prosper. Historians believe that Portuguese travelers acted initially out of their desire to eat familiar foods while staying in the ports and the settlements of West Africa. For this reason, they brought seeds of Old World crops with them when they first sailed to the continent in the mid fifteenth century.<sup>26</sup> As the slave trade developed and the Columbian trade opened up, the Portuguese and British colonists encouraged plantation-scale production of New World crops, including maize. They intended to establish the crops on African soil as a means of feeding the West African slaves detained en route to the Americas, of which there were six million in total.<sup>27</sup>

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<sup>26</sup> Only some of these Old World crops survived in the tropical climate...

<sup>27</sup> J. D. Fage, "Slavery and the Slave Trade in the Context of West African History," *The Journal of African History* 10, no. 3 (1969): 399.



**Image 5: “The Door of No Return” was the portal through which Gold Coast slaves passed before boarding European ships**  
Photo taken by Alli Honenberger

Several of the plants introduced by Europeans in the early 1500’s revolutionized the lifestyles and eating practices of Ghanaian families. Of these, maize is one that West Africans quickly embraced and still use with frequency today. Since 1960, maize has been the fourth leading crop produced in Ghana, preceded only by cassava, yam, and plantain in that order.<sup>28</sup> Traditionally, West Africans were sorghum and millet cultivators, but the production of those two crops steadily declined with the arrival of maize. Historians propose that the introduction of maize by Portuguese traders in the early sixteenth century directly led to African’s diminishing use of these traditional crops.<sup>29</sup>

The history widely accepted today begins in 1502, when the Portuguese writer Valentin Fernandes first mentioned *mihlo zaburro*,<sup>30</sup> referring either to maize or sorghum. He described the crop in the context of being transported from

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<sup>28</sup> Samuel Codjoe and Nii Ardey, “Supply and Utilization of Food Crops in Ghana, 1960-2000,” *African Journal of Food, Agriculture, Nutrition and Development* 7, no. 2 (2007):

<sup>29</sup> Derek Byerlee and Carl K. Eicher, eds., *Africa’s Emerging Maize Revolution*, (Boulder, CO: Lynne Rienner Publishers Inc., 1997), 111-113.

the Guinea Coast to Sao Tome, a West African island colony further north.<sup>31</sup> It is possible that those carrying the plant stopped in Elmina, Gold Coast, where maize was labeled with the Twi<sup>32</sup> phrase, *za aburro*, meaning “European sorghum.” In 1554, the Italian historian Gian Battista Ramusio referred to *miglio zaburro* and drew a corresponding picture of the maize plant in his account, *Del navigatione e viaggi*, in which he describes his experiences in West Africa.<sup>33</sup> Although the early history remains somewhat unclear, there is no uncertainty that maize had become a staple in the Gold Coast by 1601.<sup>34</sup> By the middle of the seventeenth century, Ghanaians living on the coast had nearly abandoned sorghum and millet as a staple grain and adopted maize as their primary starchy food. Maize came to be a staple of wider West African cooking during the seventeenth and eighteenth centuries. This period correlated with the height of the slave trade, when maize was used as food provisions for slaves and workers.<sup>35</sup>

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<sup>31</sup> Marvin P. Miracle, *Maize in Tropical Africa* (Madison, WI : University of Wisconsin Press, 1966): ch. 7

<sup>32</sup> Twi is the Ghanaian language of approximately 15 million people living in the Ashanti region, as well as in portions of the Eastern, Western, Central, Volta and Brong Ahafo Regions.

<sup>33</sup> Miracle, *Maize in Tropical Africa*, ch. 7

<sup>34</sup> S. B. Alpern, “The European introduction of crops into West Africa in pre-colonial times,” *History of Africa* 19 (1992): 24-25.

<sup>35</sup> Miracle, *Maize in Tropical Africa*, 261



**Image 6: Fisherman at the Elmina Castle in Cape Coast, once a site of the brutal slave trade, have transformed the city into a vibrant community thriving on local resources.**

Photo taken by Alli Honenberger

The colonizers found it easy to promote maize, because it grew easily in the West African climate.<sup>36</sup> Africans found that they could cultivate the new grain in less time and process it more easily than its predecessors, millet and sorghum. While it took eastern and southern Africans less than two generations to switch from these traditional staples to maize in the early twentieth century, the exchange was not as rapid among West Africans. Instead, they witnessed the rise of maize in the mid twentieth century, coincident with the improvement of agricultural technology, the construction of rural roadways, and wide-spread migration to urban centers.<sup>37</sup>

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<sup>36</sup> Byerlee, *Africa's Emerging Maize Revolution*, 10.

<sup>37</sup> Byerlee, *Africa's Emerging Maize Revolution*, 10.

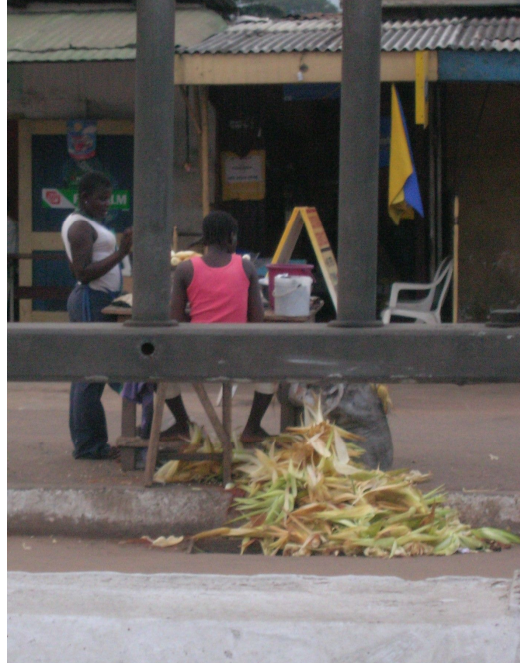
Today, many Ghanaians use maize as a fundamental element of everyday culture. Ghanaians living in both urban centers and rural communities serve maize in many popular Ghanaian dishes. Significantly, Ghanaian mothers use maize to prepare weaning foods. The intrepid Williams' article reveals a proposed association between maize consumption and *kwashiorkor* with its title, "Nutritional Disease of Childhood Associated with a Maize Diet." Yet, the link between maize and this particular form of PEM is difficult to assess because the early history is inconclusive, and because the disease is now understood to result from a diet low in protein, regardless of the exact components of that diet. Thus, researchers can only speculate about the effect that the European introduction of maize had on the nutritional health of West African children.

Unquestionably, the colonial interests in West Africa and the choices colonists made regarding local resources, land and labor transformed agricultural production and consumption in Ghana. Under European taxation, Ghanaian peasants were forced to convert portions of their land previously used for subsistence farming into fields for export agriculture.<sup>38</sup> Female and male Ghanaians alike began devoting themselves increasingly to income-earning enterprises. With this shift away from farming, Ghanaians also began to buy a larger proportion of their food supplies. Busy mothers, still primarily responsible for food preparation, welcomed less labor-intensive crops like maize and cassava.<sup>39</sup>

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<sup>38</sup> Three of the most widely cultivate export crops in Ghana are cocoa, cotton, and coffee.

<sup>39</sup> "Food in ghana," *Centre for Indigenous Knowledge Systems* (Tema, Ghana: Cefiks Publications Inc., 2000) [database online]. Available from [http://www.cfiks.org/food\\_in\\_ghana.htm](http://www.cfiks.org/food_in_ghana.htm).



**Image 7: Street vendor in Greater Accra region selling maize on the sidewalk**  
Photo taken by Alli Honenberger

Today, maize is present in nearly every Ghanaian home, many street vendor booths in Ghanaian cities, and a large percentage of fields surrounding Ghanaian villages. Regardless of its exact journey, maize plays an important role in the culture and eating practices of the Ghanaian people. No matter who first introduced maize to Ghana, the external pressure to cultivate the crop on a large scale contributed to a rise in corn consumption and the developing dependency on a protein deficient diet.

### **The Pathophysiology of *Kwashiorkor***

Researchers now recognize that the development of *kwashiorkor* is not associated with the nutritional deficiencies of maize alone. After more than fifty years of research, scientists have yet to conclusively determine the pathogenic factors which cause a child to develop *kwashiorkor*. This affliction is a form of edematous malnutrition, distinct from non-edematous malnutrition diseases, such as *marasmus*, and vitamin deficiency disorders. The edema seen in *kwashiorkor*



patients results from low serum albumin levels and the general loss of cellular substances. These deficits cause extracellular fluid to accumulate in the tissues just under the skin.<sup>40</sup> It appears that the accumulation of fluid beneath the skin of *kwashiorkor* patients distinguishes the disease from all other malnutrition disorders.

Researchers primarily support two hypotheses for the explanation of *kwashiorkor's* unique clinical manifestation. The first attributes the disease's major symptoms to a disadaptation in protein metabolism. By enduring periods of low protein consumption during key developmental phases, a child's body undergoes a degeneration of the metabolic pathways. This disruption leaves patients with a drastically reduced ability to synthesize and break down, or catabolize, proteins that are essential to fundamental body functioning. This first hypothesis is supported by the observation that *kwashiorkor* patients who immediately received protein-rich foods often developed hepatic encephalopathy, a condition of the nervous system caused by excess ammonia in the blood stream due to the liver's inability to metabolize proteins.<sup>41</sup>

The absence of protein in the diet and the consequent amino acid deficit leads to a degeneration in the liver's normal activity. The liver, the primary regulator of nitrogen balance in humans, plays a critical role in coordinating protein metabolism. The liver breaks down dietary protein into its constituent amino acids.

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<sup>40</sup> Serum albumin is a water soluble protein in the blood plasma. It is formed primarily in the liver and is responsible for maintaining osmotic pressure in the blood. Low levels of serum albumin are an indication of malnutrition.

<sup>41</sup> P.T. Castiglia, "Protein-energy malnutrition (*kwashiorkor* and marasmus): Review," *Journal of Pediatric Health Care* 10, no. 1 (1996): 28-30. p. 28.

These amino acids are circulated throughout the body in the bloodstream which allows individual cells to use them to make functional proteins. A consistent supply of dietary protein to the liver ensures an ample supply of amino acids to the whole body. On the other hand, a consistent lack of protein inhibits the body's basic functions.<sup>42</sup>

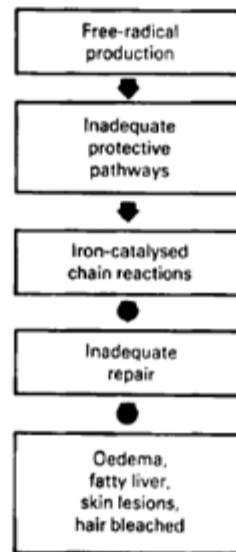
The second theory about the pathophysiology of *kwashiorkor* suggests the involvement of free radicals in cellular membrane damage. Free radicals are extremely reactive molecules or molecular fragments characterized by an unpaired electron.<sup>43</sup> The initial abundance of free radicals is caused by an imbalance in the production of free radicals and their safe disposal. The destructive activity of these free radicals is intensified by the presence of iron in the body. The iron catalyzes reduction-oxidation coupled reactions, known as redox reactions, thus increasing free radical production and stimulating the synthesis of more harmful free radical species.<sup>44</sup> The observations of free radical-induced injury in the cells of *kwashiorkor* children and the reduction in anti-free radical glutathione levels substantiate this hypothesis. The chart below provides a basic illustration of this proposed route of causation for *kwashiorkor* symptoms under this free-radical theory.

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<sup>42</sup> L. J. Worobetz et al., *The liver*, in *First principles of gastroenterology: The basis of disease and an approach to management*, 3rd ed., eds. A. B. R. Thomson and E. A. Shaeffer, (Canadian Association of Gastroenterology, 1997): 462-557. p. 464.

<sup>43</sup> Trevor F. Slater, "Free-radical mechanisms in tissue injury," *Biochemical Journal* 222, (1984): 1.

<sup>44</sup> M.H. N. Golden and D. Ramdath, "Free radicals in the pathogenesis of *kwashiorkor*," *Proceedings of the Nutrition Society* 46, (1987): 53.



**Figure 4: Proposed steps in the pathogenesis of kwashiorkor<sup>45</sup>**

The ratio of protein intake to excretion is a reliable indicator of the adequacy of a kwashiorkor child's diet. Physicians determine this measure by quantifying the amount of nitrogen entering a child's body by consumption and the amount leaving by excretion. Because proteins are large, complex nitrogen-containing compounds, one gram of nitrogen obtained from a food, urine or stool sample corresponds to 6.25 g of protein. This two-part measurement yields the patient's nitrogen balance, which is positive when intake exceeds output.

The cells of the human body are constantly breaking down and synthesizing proteins, processes that recycle nitrogen through the blood and tissues. Thus protein is necessary throughout life to maintain this dynamic balance of catabolic and anabolic activity. Pregnant women, children, and those recovering from illness

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<sup>45</sup> Golden, *Free radicals in the pathogenesis of kwashiorkor*, 55.

require a positive nitrogen balance, in which protein intake exceeds protein excretion, in order to meet all the metabolic requirements of growth, development, and repair.<sup>46</sup> During periods of concentrated growth, such as during pregnancy, infancy and childhood, people require additional protein. If they do not obtain sufficient calories, dietary protein and that already stored as fat in the tissues will be used to supply the body's energy needs. Protein in this case will only be used for protein synthesis once the energy requirement is met. For this reason, victims of *kwashiorkor* characteristically exhibit a negative protein balance, in which nitrogen excretion exceeds nitrogen intake, due to the body's use of proteins for energy needs.<sup>47</sup>

### **Local Practices Enhance the Nutritional Value of Maize**

While Westerners have made strides in understanding the development of *kwashiorkor*, the Portuguese and British traders who brought maize to West Africa four hundred years ago could not have articulated the biological consequences of a low protein diet. When these Columbian traders brought the maize plant to West Africa, they overlooked the local wisdom of Meso-American families. When Ghanaians adopted the crop as their own mothers began to implement local methods to transform the deficient crop into a more favorable weaning food. Today, Ghanaian mothers prepare numerous dishes from maize flour, using various methods to enhance the safety, flavor, and nutritive value of popular starchy meals.

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<sup>46</sup> Robinson, *Basic Nutrition and Diet Therapy*, 109-111.

<sup>47</sup> Robinson, *Basic Nutrition and Diet Therapy*, 112.

Ghanaians, like most of their West African neighbors, eat maize-based dishes as a staple of daily consumption. The majority of Ghanaian mothers follow the recommendation of weaning their children on a thick gruel prepared from fermented maize dough, a porridge, or pap, they call *akasa* or *koko*.<sup>48</sup> The low nutritional quality of the maize plant and its susceptibility to bacterial contamination, together with the continental dependence on maize, engender local and international concern. Ghanaians and outside researchers have responded by investigating simple, affordable methods for improving the safety and nutritional quality of maize and compensating for the grain's deficiencies. Ghanaians harnessed maize processing procedures as part of the solution, using fermentation, supplementation, and nixtamalization, a process in which grains are soaked and cooked in alkaline solution, to confront contamination and improve the quality of maize in both adult and weaning foods.

Mothers cannot provide the protein required by their growing infant by feeding them exclusively with cereal-based weaning foods. Children weaned with *koko* or *kenkey*, the two most common porridges given to Ghanaian infants, develop *kwashiorkor* for the lack of lysine and tryptophan, two of the nine essential amino acids critical to child growth absent in maize. While adults may come close to fulfilling their protein requirements by consuming a larger quantity of these starchy staples, infants cannot ingest the volume necessary to meet their needs in this way.

Ghanaian mothers ferment maize dough to improve the flavor, texture, and safety of maize-based dishes and weaning porridges. Ghanaians cooking in the

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<sup>48</sup> Patience Mensah, A.M. Tomkins, B.S. Drasar, and T.J. Harrison, "Antimicrobial effect of fermented Ghanaian maize dough," *Journal of Applied Bacteriology* 70 (1991): 203-210. p. 203-204

home, the majority of which are women, prepare fermented maize dough through a process that takes multiple days. After winnowing and washing the whole maize kernels, they leave them to soak at ambient temperature for one to two days. Then they drain and mill the grains, moistening them again to form the dough. Finally, they cook the porridge with six parts water for every one part fermented maize dough.<sup>49,50</sup>

The process of fermentation has an antimicrobial effect on the maize dough. By soaking maize dough in water and allowing it to ferment Ghanaian mothers effectively reduce the risk of infant infections caused by contaminated weaning foods.<sup>51</sup> A mother's ability to ensure hygienic conditions for her infant is limited by the lack of infrastructure in many areas of the developing world.<sup>52</sup> This reality partially accounts for the fact that one out of every two children dying of infectious diseases is malnourished,<sup>53</sup> and the high rate of infection among *kwashiorkor* patients. *Kwashiorkor* is directly associated with infection and diarrheal disease. After inadequate protein and carbohydrate intake, the second most frequent cause

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<sup>49</sup> Mensah, *Antimicrobial effect of fermented Ghanaian maize dough*, 204.

<sup>50</sup> Pieter de Marees, *Description and Historical Account of the Gold Kingdom of Guinea, 1602*, Albert Van Dantzig, ed, (Oxford:Oxford University Press, 1988): 62, 224-25.

<sup>51</sup> Mensah, *Antimicrobial effect of fermented Ghanaian maize dough*, 203.

<sup>52</sup> The infrastructural challenges that affect infection rates include, but are not limited to: inadequate sewage and drainage systems that generate standing water, which is a breeding ground for infectious agents, limited access to electricity that would make it easier for mothers to boil water, poor standards of roadways and means of transportation, which would make health service and immunizations more available to those in rural communities.

<sup>53</sup> Ulrich, *Malnutrition and infection: Complex mechanisms and global impacts*, 806.

of PEM is severe or chronic infection.<sup>54</sup> With this in mind, physicians often prescribe antibiotics for the treatment of *kwashiorkor* patients.<sup>55, 56</sup>

Fermentation alone is ineffective as an independent method for preventing *kwashiorkor* in weaning infants.<sup>57, 58</sup> It only slightly improves the amino acids available in maize and has a minimal effect on the protein content and quality. However, the anti-bacterial function of fermentation makes it an indirect prevention technique. When Ghanaian mothers soak whole maize grains in water, they boost the anti-microbial quality of the dough. This process promotes the growth of lactic acid bacteria, yeast, molds, and aerobic bacteria,<sup>59</sup> friendly microorganisms whose presence inhibits a range of harmful bacterial agents.<sup>60, 61</sup>

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<sup>54</sup> Olaf Müller and Michael Krawinkel, "Malnutrition and health in developing countries," *Canadian Medical Association Journal (CMAJ)* 173, no. 3 (2005): 279.

<sup>55</sup> Ian Phillips and Brian Wharton. "Acute bacterial infection in *kwashiorkor* and marasmus," *British Medical Journal* 1 (1968): 407.

<sup>56</sup> Antibiotics should only be given if the presence of infection is certain. While the areas where *kwashiorkor* is endemic have limited bacteriological services, the clinical signs of infection or severe diarrheal disease are grounds for administering antibiotics. Routine use of antibiotics, where only half of malnourished children suffer from infection, is not recommended as these drugs can produce significant side effects in non-infected patients.

<sup>57</sup> M. Asiedu, E. Lied, R. Nilsen, and K. Sandes, "Effect of processing (sprouting and/or fermentation) on sorghum and maize: Vitamins and amino acid composition, biological utilization of maize protein," *Food Chemistry* 48, no. 2 (1993): 201.

<sup>58</sup> Emmanuel O. Afoakwa, Samuel Sefa-Dedeh, and Beatrice Cornelius. "Effect of fermentation on the quality characteristics of nixtamalized corn," *Food Research International* 36 (2003): 57.

<sup>60</sup> The antimicrobial function of lactic acid bacteria is attributed to their production of organic acids, hydrogen peroxide, and bacteriocins. A. Olsen, M. Halm, and M. Jakobsen. "The antimicrobial activity of lactic acid bacteria from fermented maize (kenkey) and their interactions during fermentation." *The Society for Applied Bacteriology* 79, no. 5 (1995): 507.

<sup>61</sup> Mensah, *Antimicrobial effect of fermented Ghanaian maize dough*, 203-204.

Lactic acid bacteria *Lactobacillus plantarum* and yeasts *Saccharomyces cerevisiae* and *Candida mycoderma* are primarily responsible for the enhanced flavor of fermented maize dough, while aerobic bacteria *Aerobacter cloacae* is credited with increasing the riboflavin and niacin content of the porridge. Other bacterial strains, including *Lactobacillus brevis* and *Lactobacillus acidophilus*, excrete the chemicals that are thought to contribute to the anti-microbial effects of fermented maize dough.<sup>62</sup>

In examining the effectiveness of fermentation against various forms of bacteria, researchers have given special attention to two rod-shaped, Gram-negative, non-spore forming strains, *Shigella* and enterotoxigenic, or diarrhea-causing, *Escherichia coli* (ETEC). *Shigella flexneri* is the most common form of shigella bacteria in Ghana, while ETEC is a prevalent food and water contaminant in the developing world; both are leading causes of diarrheal disease in Ghanaian children. Diarrhea is a disease of particular importance because it leads to severe dehydration and malnutrition. It is of note that fermentation effectively kills all coliform bacteria, of which ETEC is one species. Coliform bacteria commonly inhabit the intestines of humans and constitute forty percent of the flora resident in maize.<sup>63, 64</sup>

After mothers cook the maize dough, the antimicrobial effect of fermentation is reduced. The possible reasons for the loss of anti-bacterial function include a) the

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<sup>62</sup> Mensah, *Antimicrobial effect of fermented Ghanaian maize dough*, 208.

<sup>63</sup> Mensah, *Antimicrobial effect of fermented Ghanaian maize dough*, 203-204.

<sup>64</sup> Scientists have also found that fermented milk products sold as infant formula in the United States inhibit diarrheal pathogens.



destruction of heat sensitive antimicrobial substances, b) the dilution of antimicrobial substances with the addition of water for cooking, or c) the harboring of harmful bacteria in the gelatinous porridge.<sup>65</sup> For these reasons, it may be important for mothers to serve maize-based meals in a timely manner and encourage their children to eat soon after preparation.<sup>66</sup>

While mothers and physicians work to optimize food sanitation, they have also developed their own techniques to overcome the nutritional deficiencies of maize. Ghanaians employ two methods, supplementation and nixtamalization,<sup>67</sup> to enhance the nutritional quality of maize. Both of these practices are analogous to those of the Aztec and Mayan farmers of Central America between 1200 and 1500 B.C. These New World farmers were the first to domesticate the grain and to develop processing methods. The people of Latin America still adhere to their anciently devised enrichment techniques of supplementation and processing. For instance, cooks in Latin America soak maize used for tortillas in an alkali solution such as diluted wood ash or limewater. This activates the amino acids and niacin stored in the kernel, making them more nutritionally available.

Although Meso-Americans developed these methods to enhance maize-based meals, the European colonizers did not transfer these techniques when they shipped maize to West Africa. The Portuguese and British traders were likely unaware of

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<sup>65</sup> Mensah, *Antimicrobial effect of fermented Ghanaian maize dough*, p. 208.

<sup>66</sup> This was not a topic of my interviews, but with further research, I'd like to ask whether this care to eat quickly is taken in Ghana.

<sup>67</sup> The term originated from the Nahuatl-speaking Aztec Indians as a combination of *nextli*, or "ashes," and *tamalli*, or "unformed corn dough."

ancient maize processing practices and their importance in preventing childhood malnutrition. Although West Africans had developed their own maize enrichment practices, the transport of maize to Africa without the associated Meso-American nutrient-activating processes may have impacted the nutritional health of Ghanaian children. This is evidenced by the relative degrees of protein malnutrition in those two world regions where maize constitutes a major part of the daily diet. Today, the prevalence of PEM in sub-Saharan Africa is 15% as opposed to the lower rate of 5% found among Latin Americans.<sup>68</sup>

Despite the European failure to transmit these ancient maize processing methods, Ghanaian mothers are resourceful and choose to cook with what they can cultivate on the land around their homes. When they are unable to afford meat or the other protein sources sold in the market, they will generally supplement starches with protein-rich legumes and vegetables and occasionally with locally available animal products. For instance, people in the coastal regions prepare fish, while those living in pastoral communities further inland incorporate milk into their diet.<sup>69</sup>

Foods that provide amino acids in the proportions required for tissue repair and growth are said to supply protein of “high biological value,” or “complete protein.” These foods include meat, fish and poultry, in addition to eggs, milk, and cheese. Cereals, legumes, vegetables and nuts, on the other hand, contain inadequate

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<sup>68</sup> de Onis, *The world-wide magnitude of protein-energy malnutrition: An overview from the WHO global database on child growth*, 703.

<sup>69</sup> Bondzi, Cornelius, MD, Interview with author, July 2008.

amounts of one or more essential amino acids and are not complete protein sources. When complete protein sources are not available, mothers can provide the amino acids needed for their infant's growth by combining several foods from the second category of incomplete protein sources.<sup>70, 71</sup>

Despite the variability in climate, soil, and resources, Ghanaians in every region cultivate two relatively inexpensive sources of protein: cowpeas and groundnuts (peanuts). Ghanaians add cowpeas, or black-eye peas, to cereal dough to enhance its nutritive quality.



**Image 8: Red-red is a popular Ghanaian meal that exemplifies the practice of supplementation, as it combines starchy plantains with fish and cowpeas.**

Photo taken by Alli Honenberger

Of the approximately 8.7 million hectares of land in the world dedicated to cowpea cultivation, Africa contains eighty-seven percent. Farmers in West and

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<sup>70</sup> Corinne H. Robinson and Emma S. Weigley. *Basic Nutrition and Diet Therapy*, 6<sup>th</sup> ed. (New York: Macmillan Publishing Company, 1989), 111.

<sup>71</sup> Some familiar examples of such combinations from North and South American cuisine include: macaroni and cheese, milk and cereal, black-eyed peas and cornbread, and tortillas and beans.

Central Africa grow 2.6 of the 3.7 tons of cowpea produced annually, or roughly 70%. Ghanaians consider the cowpea a valuable resource, as it is well-adapted to drought conditions. Cowpeas, approximately 25% protein,<sup>72</sup> contribute the essential amino acid lysine to legume-cereal combinations, where maize provides methionine, but not lysine. In studying the microbial ecology<sup>73</sup> of fermenting fortified maize dough, scientists find that the addition of cowpea at the twenty percent level does not change the natural antibacterial benefits of fermenting maize dough, while it does enhance the nutritional value.<sup>74</sup>



**Figure 5: Drawing of the cowpea plant and pod.<sup>75</sup>**

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<sup>72</sup> Vincent Nwanma, "African Cowpea Farmers Benefiting From New Varieties, IITA Says," *Bloomberg*, March 9, 2009, Africa section. Available from: <http://www.bloomberg.com/apps/news?pid=20601116&sid=aFznmAmtG0ZI&refer=africa>.

<sup>74</sup> A.I. Sanni, S. Sefa-Dedeh, E. Sakyi-Dawson, and M. Asiedu, "Microbiological evaluation of Ghanaian maize dough co-fermented with cowpea," *International journal of food sciences and nutrition* 53, no. 5 (2002): 367.

<sup>75</sup> [http://www.iita.org/cms/details/cowpea\\_project\\_details.aspx?zoneid=63&articleid=269](http://www.iita.org/cms/details/cowpea_project_details.aspx?zoneid=63&articleid=269)

Even though Ghanaians cultivate cowpeas for consumption and marketing, both inter-regionally and internationally, the country is a net importer of this particular legume. Ghanaians, unlike a fraction of their West African neighbors, are required to pay a premium on cowpeas.<sup>76, 77</sup> Cowpea would be a more viable protein source if its price were reduced to make it readily available even to poor families.

Another incomplete protein source that Ghanaian mothers use to supplement an infant's diet is the peanut. Like maize, groundnuts, or peanuts, were brought by Europeans to the West African Coast in the early fifteenth century. Peanuts contain as much as 38% protein, and can be broken down into oil and residue. The oil, which constitutes approximately 45% of the nut, is relatively expensive compared to the wide variety of cooking oils used in Ghanaian cuisine. The remainder of the nut can be made into peanut flour, which is used as a feed for livestock and protein-rich supplement for humans. Peanut flour is already used as an ingredient in high-protein baby foods in parts of tropical Africa.

Ghanaian mothers have also adapted the process of nixtimalization to enhance the nutritional quality of local maize dishes. Where complementary protein sources are not available or affordable, this treatment of the grain can boost the amount of protein, essential amino acids, and niacin nutritionally available in the kernel. By soaking the kernels in alkaline solution, such as limewater or water mixed with ash, typically from wood or shells, mothers can partially overcome the deficiencies that can lead to *kwashiorkor*. The biochemical effects of nixtamilization

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<sup>77</sup> Augustine Langyintuo and Jess Lowenberg-DeBoer, "Cowpea supply and demand in west and central africa." *Field Crops Research* 82, no. 2-3 (2003): 215-31. p. 228.

are extensive, as the simple soaking process a) increases free calcium levels, b) increases the bioavailability of iron and other related minerals, c) speeds up the release of amino acids, d) increases free nicotinic acid levels, and e) increases the availability of niacin.<sup>78</sup> All told, the biochemical effects of nixtamalization are very beneficial to the overall nutritional value of maize.

Ghanaian mothers use the processes of fermentation, supplementation and nixtamalization to improve the overall safety and nutritional value of maize. These processes used effectively in combination may be essential to the prevention of *kwashiorkor*. By combining nixtamalization and fermentation when preparing maize-based gruels, mothers not only enhance the flavor and consistency of the dough, but they also improve the nutritional quality and safety of the dishes prepared from them.<sup>79</sup> When mothers subject nixtamalized corn to spontaneous fermentation, they produce thin, energy dense gruels with qualities that could solve the low energy density problem of weaning foods prepared with fermented maize grains.<sup>80</sup> In addition, when Ghanaian mothers supplement their children's diet with locally available meats, beans, legumes and vegetables, they provide a more diverse set of amino acids than those available in maize alone.

Throughout the centuries, Ghanaian mothers have responded with resourcefulness and innovation to combat the nutritional disorder plaguing their

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<sup>78</sup> Sefa-Dedeh, Samuel et al., "The microflora of fermented nixtamalized corn," *International Journal of Food Microbiology* 96 (2003): 98.

<sup>79</sup> Afoakwa, *Effect of fermentation on the quality characteristics of nixtamalized corn*, 63.

<sup>80</sup> Afoakwa, *Effect of fermentation on the quality characteristics of nixtamalized corn*, 57.

children. They have developed methods to overcome the deficiencies which characterize popular Ghanaian starches. Even before Europeans traders arrived on the West African coast, these women recognized the condition that Williams revealed to the Western world in 1933, although they may not have understood its etiology or the biochemical mechanisms involved. Williams demonstrated the ideal of solidarity as she listened to the Ghanaian women she served and sought to establish viable health services for local women and children. Still today, Ghanaian mothers offer unparalleled wisdom and expertise concerning *kwashiorkor* within the local context. By partnering with one another, foreign aid workers and Ghanaians can integrate science and experience to yield successful and sustainable campaigns against *kwashiorkor*.

## Chapter 2: Local Involvement in Past and Present Campaigns

### Nutritional Rehabilitation and RUTF

After witnessing the tragic fate of many Ghanaian youth, Cicely Williams insisted that a child with *kwashiorkor* would die if not treated with food supplementation before the skin condition was fully developed.<sup>81</sup> By reintroducing the necessary nutrients in the early phases of the disease, parents and doctors can nurture malnourished children back to health. With the conclusion of World War II, a surge of globally-minded westerners took interest in the problem of protein malnutrition, over ten years after Williams published her article on *kwashiorkor*.<sup>82</sup> Since then physicians have collaborated with international organizations to design dietary rehabilitation schemes, but few of these campaigns offer products that are affordable for Ghanaian families independent of the aid scheme. More sustainable and comprehensive plans can be implemented by turning to local ideas, and applying national and international resources to Ghanaian endeavors.

Westerners have a long history of considering their understanding of *kwashiorkor* and its appropriate treatment as “scientific” and therefore superior, but this assessment falls short in light of Europeans’ early efforts to treat the disease. In response to advancing medical understanding of *kwashiorkor* and child health, foreign aid workers have since revised the original design and implementation of

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<sup>81</sup> Williams, *A nutritional disease of childhood associated with a maize diet*, 426.

<sup>82</sup> Michael H. N. Golden, “Oedematous malnutrition,” *British Medical Bulletin* 54, no. 2 (1998): 433-444. p. 343.



rehabilitative nutrition plans. Pediatricians and nutritionists responsible for administering treatment now recognize the dangers associated with immediately feeding *kwashiorkor* children protein-rich foods, the approach once widely assumed by doctors.<sup>83</sup> According to improved strategies, severely malnourished *kwashiorkor* patients are given low-protein foods initially. After the first phases of rehydration, electrolyte replacement, and carbohydrate feeding, caretakers begin feeding these patients therapy food of incrementally increasing protein content.<sup>84</sup> Doctors and parents must strictly adhere to this step-wise model to protect recovering children from developing conditions associated with impaired nitrogen processing that lead to excess ammonia in the bloodstream, such as hepatic encephalopathy.

While researchers of the industrialized world have a financial advantage and opportunity for scholarship impossible for many Ghanaian scientists, the latter are more knowledgeable about the specific needs of the local people. The former should learn from Ghanaian efforts, past and present, in designing and refining their therapeutic strategies. The most prominent internationally-developed therapy food is the World Health Organization's F-100 and F-75 milk-based formula series, developed in 1994. While it is highly effective biologically for the prevention of *kwashiorkor*, the dissemination and reliable administration of the product is difficult. Once mothers acquire and prepare these high-protein energy-dense formulas for use, which requires money and training, the short shelf life and

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<sup>83</sup> Moisés Béhar et al., "Principles of treatment and prevention of severe protein energy malnutrition in children (*kwashiorkor*)," *Annals of the New York Academy of Sciences* 69, (1958): 954-968. p. 956-967.

<sup>84</sup> Low-protein here refers to less than 1 g/kg body weight.

susceptibility to contamination make these beverages unfavorable for the Ghanaian climate.<sup>85</sup> An alternative example exists in Incaparina, a therapy food introduced by the Institute of Nutrition of Central America and Panama (INCAP) over twenty years ago. Combining locally available vegetable proteins, Incaparina's creators intended for the product to be a generic model, instead of a precise formula. This allowed malnourished peoples from around the world to adopt the idea of Incaparina and mold it according to their particular resources. Nevin Scrimshaw, describes the designers' goal:

The objective, then, was to provide a beverage with the nutritional equivalent of milk in a culturally acceptable form at as low a cost as possible for the benefit of a sector of the population with modest purchasing power.<sup>86</sup>

Furthermore, the INCAP members who continued working with Incaparina considered thinning the mixtures with amylase, an enzyme for liquefying cooked carbohydrates, to make a more easily ingestible product. However, the additional costs associated with this process and its departure from many porridge-based weaning practices deterred them from adopting it. They also feared that thinning would encourage mothers to bottle feed, which increased the likelihood of contamination and premature weaning. This type of preventative therapy scheme, designed by local engineers who thoughtfully consider the effects of local context

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<sup>85</sup> A. Briend and N.W. Solomons, "The evolving applications of spreads as FOODlet for improving the diets of infants and young children," *Food Nutrition Buletin* 24, no. 3 (2003): 34-38.

<sup>86</sup> Nevin S. Scrimshaw, "A look at the Incaparina experience in Guatemala," *Food and Nutrition Bulletin* 2, no. 2 (1980). Available from:  
<http://www.unu.edu/Unupress/food/8F022e/8F022E01.htm>

and culture, holds great promise as a sustainable strategy for rehabilitating Ghanaian children with *kwashiorkor*.<sup>87,88</sup>



**Image 9: Incaparina is a therapy food made from a mixture of locally-available vegetable proteins.<sup>89</sup>**

Whether developed internationally or locally, therapy foods and formulas are typically given to children by their mothers. As the primary administrators of these therapy foods, Ghanaian women play a central part in their success. An important component of any campaign should provide a context in which Ghanaian mothers can share their expertise with public health professionals. Foreigners' esteem for local perspectives, attention to local observations, and development of local resources are critical to effective rehabilitation campaigns.

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<sup>87</sup> Robinson, *Basic Nutrition and Diet Therapy*, 117.

<sup>88</sup> Scrimshaw, "A look at the Incaparina experience in Guatemala."

<sup>89</sup> "Incaparina" *E.D.T. U.S.A. Corporation*, Miami, FL. Available from: [http://www.edtusacorp.com/en/products/Incaparina/Incaparina\\_nutrition\\_beverage.html](http://www.edtusacorp.com/en/products/Incaparina/Incaparina_nutrition_beverage.html)

## Ghanaian Health Care

### Improving the Quality and Accessibility of Services

Ghanaian health care workers play a central role not only in the execution of these rehabilitation campaigns but also in the sustainable implementation of prevention schemes. The Ghanaian health care system is composed of three main sectors: public, private and traditional. Within the public branch, government-funded practitioners offer services at district, regional, and national facilities. Private facilities are managed by individuals and organizations independent of the national government, including NGO staff and missionaries. Traditional medicine includes herbalists, traditional and spiritual healers. In the words of one medical historian, “traditional healers have been present in Africa from time immemorial.”<sup>90</sup> West Africans’ first contact with Western medicine came with the arrival of European doctors aboard the ships that landed off the coast in the fifteenth century. With the rise of the slave trade, Western ideas about medicine impacted the lives of West Africans more deeply, as the slaves driven onto the ships were sometimes subject to biomedical treatment. Western physicians also settled on African soil to help control the “enigmatic disease environment in West Africa.”<sup>91</sup> Under colonial rule, West African contempt for traditional healing grew and a dependence on Western medicine gradually developed.<sup>92</sup> When Ghanaians’ gained independence in

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<sup>90</sup> Adell Patton, *Physicians, Colonial Racism, and Diaspora in West Africa* (Gainesville, FL: Gainesville University Press, 1996): 17.

<sup>91</sup> Patton, *Physicians, Colonial Racism, and Diaspora in West Africa*, 54.

<sup>92</sup> Beginning in earnest in the 1960's, Western medical professionals started to recognize the efficacy of select traditional therapies.

1957, many European doctors returned home for fear of losing their professional standing in an un-colonized African nation. The sudden flight of these specialists impacted the quality of health care in post-colonial Ghana, as Ghanaian physicians and patients had become dependent on the British system, which was established by colonial administrators and subsequently abandoned.<sup>93</sup>

In today's world, Ghanaian mothers are limited in their struggle to improve their children's nutritional health by the quality and accessibility of medical services offered to women and children in Ghana. Through improved educational and medical services for mothers and children, health care officials and clinicians in Ghana have the power to reduce the rate of *kwashiorkor*. Health workers can empower mothers through education and counseling about feeding and caring for their children. Because the primary cause of *kwashiorkor* is insufficient protein supply during breastfeeding, or a hasty introduction to the adult diet during weaning, the disease's development is strongly associated with mothers' actions.<sup>94</sup> A better understanding of the interconnectedness of maternal and infant health and the importance of mothers' decisions on the nutritional well-being of their children will give international aid workers an improved foundation on which to take future action. Many West African mothers are making sacrifices daily so their children can grow up to be healthy and influential individuals. But uninformed and unsupported sacrifice has proven insufficient. Ghanaian mothers have a diligent spirit to see their

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<sup>93</sup> Patton, *Physicians, Colonial Racism, and Diaspora in West Africa*, 37-38.

<sup>94</sup> Willemot, *Funds needed urgently to fight malnutrition in mauritania*.

children get well, but they may be misguided about the best treatment methods or barred from access to medical services.

The opinions of West African expatriates, who have experienced the positive and negative aspects of health care in their home countries and abroad, are a valuable resource for foreigners desiring to help improve medical services in Ghana. While the experiences of three West Africans from Ghana, Nigeria, and Sierra Leone illuminate several of the general characteristics of health care within that region, their assessment differs from that of their fellow countrymen who continue to live on Ghanaian soil. While comparative stance of these expatriates is helpful,<sup>95</sup> their choice to remain abroad means they will not directly suffer or benefit from the health services offered in Ghana. Thus, international aid workers must also gather the views of Ghanaian residents concerning the quality and accessibility of local services.

Ghanaians living in Ghana and abroad recognize the following weaknesses of the current health system: 1) insufficient personnel, 2) low retention of locally trained doctors and 3) underutilization of services. The first is linked to the second within the higher education system, while the third is the product of economic, social and cultural factors. The reality of limited finances affects the entire health care system in Ghana. Despite recent developments in Ghanaian health care, the people serving in and receiving from the field acknowledge its flaws. Although the

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<sup>95</sup> Based on the insights of several interviewees, health care professionals in West Africa adopt a “more personal...hands on approach,” than that seen in the United States. Their practice seems less “forced” and restricted by policies. Yet others praised the American system for the insurance coverage and the bureaucratic formalities that prevent corruption and bribery from influencing health care administration.

number of clinics and personnel in Ghana exceed that of Sierra Leone and Guinea, Ghanaian patients continue to feel the burden of too few physicians.<sup>96, 97</sup> In the US, the physician to patient ratio is roughly 1 to 400. In Ghana there exists only one doctor for every 17,700 citizens. And most of those doctors practice in Accra and Kumasi, the nation's two most populous cities.<sup>98</sup> This leaves thousands, if not millions of rural Ghanaians with very limited access to physician care.<sup>99</sup>

Understaffing in Ghanaian medical facilities is a setback for health care providers as well. The dearth of trained professionals places particular pressure on children's' wards. Of the projected 43,000 health workers required to meet the health care demands of roughly 20 million Ghanaians, there were only 21,262 in 2000. This amounts to more than a fifty percent discrepancy.<sup>100</sup> Even today, a visit to the Volta Region Hospital in Ho reveals an entire neonatal wing in non-use. A rudimentary appointment room in that hospital has been designated as a restricted access area,<sup>101</sup> where a mother sits rocking her 0.9 kg<sup>102</sup> premature baby in her

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<sup>96</sup> Michael Attafuah, E-mail correspondence with author, August 2008.

<sup>97</sup> Victor Lavy, John Strauss, Duncan Thomas and Philippe de Vreyer, "Quality of health care, survival and health outcomes in Ghana," *Journal of Health Economics* 15, no. 3 (1996): 335.

<sup>98</sup> Emmanuel K. Dogbevi and Cecilia Uddenfe, comment on "Doctor-patient ration in Ghana to worsen as financial crisis deepens," Ghana Business News, comment posted on February 10, 2009. Available from: <http://ghanabusinessnews.com/2009/02/10/doctor-patient-ratio-in-ghana-to-worsen-as-financial-crisis-deepens/>

<sup>99</sup> One undeniable factor in the transforming medical environment is the population boom occurring throughout much of the continent and the world. Despite the problem of underutilization, population growth, along with urbanization, has translated into a rising pressure on health care in Ghana over the last 20 years.

<sup>100</sup> Dogbevi, *Doctor-patient ration in Ghana to worsen as financial crisis deepens*.

<sup>101</sup> This was intended to be the equivalent of "restricted access" areas seen in hospitals throughout the industrialized world where a gown and facemask are required due to the highly sensitive condition of the patient staying in the restricted quarters.

arms. It was in response to the hospital's lack of a neonatal ward that a beloved pediatrician of the Volta Region reserved the room for babies less than 8 weeks old. In spite of the gravity of his decision, he jovially exclaimed, "I improvise...in Africa we improvise a lot."<sup>103</sup>

The need to improvise might be eased with a higher retention rate for locally-trained health providers. The tendency of Ghanaian professionals to complete their education and move away is a key element in what many Ghanaians and Africans call 'brain drain.'<sup>104</sup> Higher education institutions lack incentives to persuade their graduates to stay. In addition, the infrastructure of the health care system fails to attract medical professionals. Fewer physicians may translate into fewer hospital visits from women and children, especially among those generally unable to afford doctors' fees. Thus, 'brain drain' is an obstacle in the battle against PEM. One strategy that might improve doctor retention in Ghana and other developing countries is enhanced health worker compensation. Observers have advised that salary improvements be offered to those willing to practice in rural areas, even if only for a short term.<sup>105, 106</sup> While the government may be less willing

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<sup>102</sup> By definition, low-birth weight babies are those weighing less than 5lb.8oz. or 2.5 kg at birth.. Available from: <http://jama.ama-assn.org/cgi/reprint/287/2/270.pdf>

<sup>103</sup> Lord Mensah, MD., Conversation with author, June 2008.

<sup>104</sup> Multiple interviews with author confirmed the effect of "brain drain" in Ghana and many African nations. This concept also emerged at the Unite for Sight Global Health and Development Conference, attending by the author.

<sup>105</sup> A. Hagopian et al., "The flight of physicians from West Africa: Views of African physicians and implications for policy." *Social Science & Medicine* 61, no. 8 (2005): 1750-1760.



to spend a lot of money on salary increases, other more cost-effective incentives could include fringe benefits, or provisions for transportation and housing.<sup>107</sup>

The funding for such an incentive program could come from the United States, England, and other wealthier nations already benefitting from the immigration of physicians from the developing world. British medical officers adopted policy measures to limit their professional school recruitment out of developing countries, but these regulations have never been fully implemented. In the American health system, not centrally organized like that of England, administrators have limited ability and little motivation to enforce such a restriction on private parties.<sup>108</sup>

Beyond the problems of low-staffing and the loss of medical professionals, underutilization of health services is another issue that reveals the barriers faced by Ghanaian mothers in trying to achieve optimal health for themselves and their children. It is not only those with more preventable and treatable diseases, such as moderate *kwashiorkor*, that fail to use the available services available, but also those with incurable diseases, such as HIV/AIDS. While Ghanaians do not face the overwhelming percentages of AIDS seen in other African countries, the reported infection rate does not reflect the true number of victims. Because this rates is a

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<sup>106</sup> This type of service-scholarship exchange is already practiced in the Ghanaian education system under the title "National Service." In the realm of medicine, it may resemble the National Health Service Corps found in the United States.

<sup>107</sup> Hagopian, *The flight of physicians from West Africa : Views of African physicians and implications for policy*, 1758-1759.

<sup>108</sup> Hagopian, *The flight of physicians from West Africa: Views of African physicians and implications for policy*, 1759.

national average, it does not capture the variations among different regions, ages, genders, occupations, and urban versus rural residence. Researchers estimate that only thirty percent of HIV cases are reported due to stigma reduced health-seeking behavior, and inaccessible services.<sup>109</sup>

In addition to insufficient personnel, low retention of locally trained doctors and underutilization of services, several other weaknesses of the health care system affect malnourished children in Ghana: 1) lack of equipment, 2) weak administration and 3) lack of specialists in pediatrics and maternity care. Hospitals and clinics lack advanced and even basic equipment.<sup>110</sup> This restricts the procedures doctors and nurses are able to perform. In the words of one West African, who came to America several years ago and is now pursuing a medical degree with dreams of returning to the place of her birth and practicing medicine there,

“If you’re in Africa and you start to get a headache, you better leave. We don’t have running water in the hospitals or electricity. We don’t have neural surgeons or cardiologists.”<sup>111</sup>

In another example, an older woman born in Sierra Leone received a scholarship to train as an X-ray technician in Hungary. When she returned to Sierra Leone to marry and start a family, she could not secure a job in her newly acquired

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<sup>109</sup> “At a glance: Ghana,” *UNICEF* in Unite for Children. Available from: <http://www.unicef.org/infobycountry/ghana.html>

<sup>110</sup> The one and only CT scan at Korle-Bu Hospital was out of commission at the time of our visit to the facility. This is not an example of the “lack of equipment” exactly, but perhaps another indication of ‘brain drain’ as engineers seeking professional degrees may also settle abroad.

<sup>111</sup> Isata Sesay, Interview with author, July 2008.

specialty. There was no X-ray equipment in the country with which she could work.<sup>112</sup>

West Africans also recognize the need for better administration of health care facilities. As a native Sierra Leonean articulated, “We need someone to run the hospitals that is not corrupt, that doesn’t really care about the money, but just wants to help people.” She mentioned the possibility of introducing policies to prevent corruption.<sup>113</sup> Furthermore, a doctor in her last year of residency in Ghana’s capital city of Accra responded quickly when asked about the greatest need of Ghanaian health care today, “Better management.”<sup>114</sup>

While physicians feel restricted by poor equipment and poor oversight, they are also in want of more specialized training in maternal and pediatric medicine. The lack of understanding about child health and pregnancy, both in Ghana and around the globe, has greatly restricted the advancement of quality services for mothers and their children. Improving pediatric and maternity care is vital to the Ghanaian battle against *kwashiorkor*. Both the low number of pediatricians and the prevailing misconceptions of general practitioners concerning child health contribute to the prevalence of the disease. Even in the American medical industry, where more money is poured into health care, young patients suffer because of the prevailing theory that children can be medically treated as small adults. Prior to the 2007 push by the Food and Drug Administration (FDA) for more comprehensive

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<sup>112</sup> Gbessy Sesay, Interview with author, July 2008.

<sup>113</sup> Isata Sesay, Interview with author, July 2008.

<sup>114</sup> Eunice Adei, MD., Conversation with author, June 2008.

research into pediatric drugs, only 20 percent of FDA approved drugs were labeled specifically for children.<sup>115</sup> Bombarded with sick children and mothers demanding medication, doctors have routinely prescribed drugs that have not yet been shown to be safe and effective in children. It is only in the last hundred years that physicians have widely understood that children are biologically distinct from adults.

The course of medical training in Ghana is now shifting to amend this problem. Susan Gyankorama De-Graft Johnson, the first Ghanaian woman to qualify as a physician, pioneered pediatrics in Ghana in the 1950's. Both she and Matilda Clerk, the second female doctor in Ghana, worked for a portion of their professional career at the Princess Marie Louis Hospital for Women located in Korle-Bu.<sup>116</sup> Contemporary West African women have words and actions to contribute to the future of pediatric care as well. An aspiring doctor from Sierra Leone now attending William and Mary could not recall a time when she visited a pediatrician in her birth country. She ventured to guess that most West African mothers take their children to see "regular doctors."<sup>117</sup> This common practice might result in children receiving incorrect treatments. A Ghanaian doctor in her last year of residency at Korle-Bu spoke confidently about the recent changes to medical education in Ghana. According to her, trainees now receive a full year of rotation within pediatrics.

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<sup>115</sup> FDA, "Drug Research and Children," *FDA Consumer Magazine*. Available from: <http://www.fda.gov/fdac/special/testtubetopatient/children.html>

<sup>116</sup> Patton, *Physicians, Colonial Racism and Diaspora in West Africa*, 29.

<sup>117</sup> Isata Sesay, Interview with author, July 2008.

Ghanaians hope this amendment will help reduce the incidence of *kwashiorkor* and other childhood diseases.<sup>118</sup>

The need for more doctors who specialize in pediatric care is evident in Ghana, where the children's ward of the country's largest hospital, Korle-Bu Teaching Hospital in Accra, is understaffed. It is not common for parents to take children to the hospital until they are seriously ill. Too often childhood health conditions are overlooked or exasperated by this delay. Mothers are able to prevent severe medical conditions by seeking the attention of a physician at the first, and generally subtle, signs of illness in their children.<sup>119</sup> For example, infants with jaundice often arrive at Korle-Bu with yellow skin. Mothers, believing their babies will get better if wrapped tightly in garments and kept away from sunlight, do not notice the skin changing color until they remove the clothes. These mothers act on knowledge acquired through labor and local wisdom in an attempt to nurse their children back to health. With right intentions, these women still need to partner with health care providers to achieve nutritional and all-around health for their children. Inaccessibility to health services and general disregard for childhood health within Ghana limit mothers' ability to effectively combat *kwashiorkor* and other childhood illnesses.<sup>120</sup>

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<sup>118</sup> Eunice Adei, MD., Conversation with author, June 2008.

<sup>119</sup> A resident doctor at Korle-Bu teaching hospital introduced us to several patients who might have been easily treated had they come to the hospital at an earlier stage of their condition. Because they did not see a doctor until the disease had progressed, their parents faced expensive hospital bills and the possibility of losing their child.

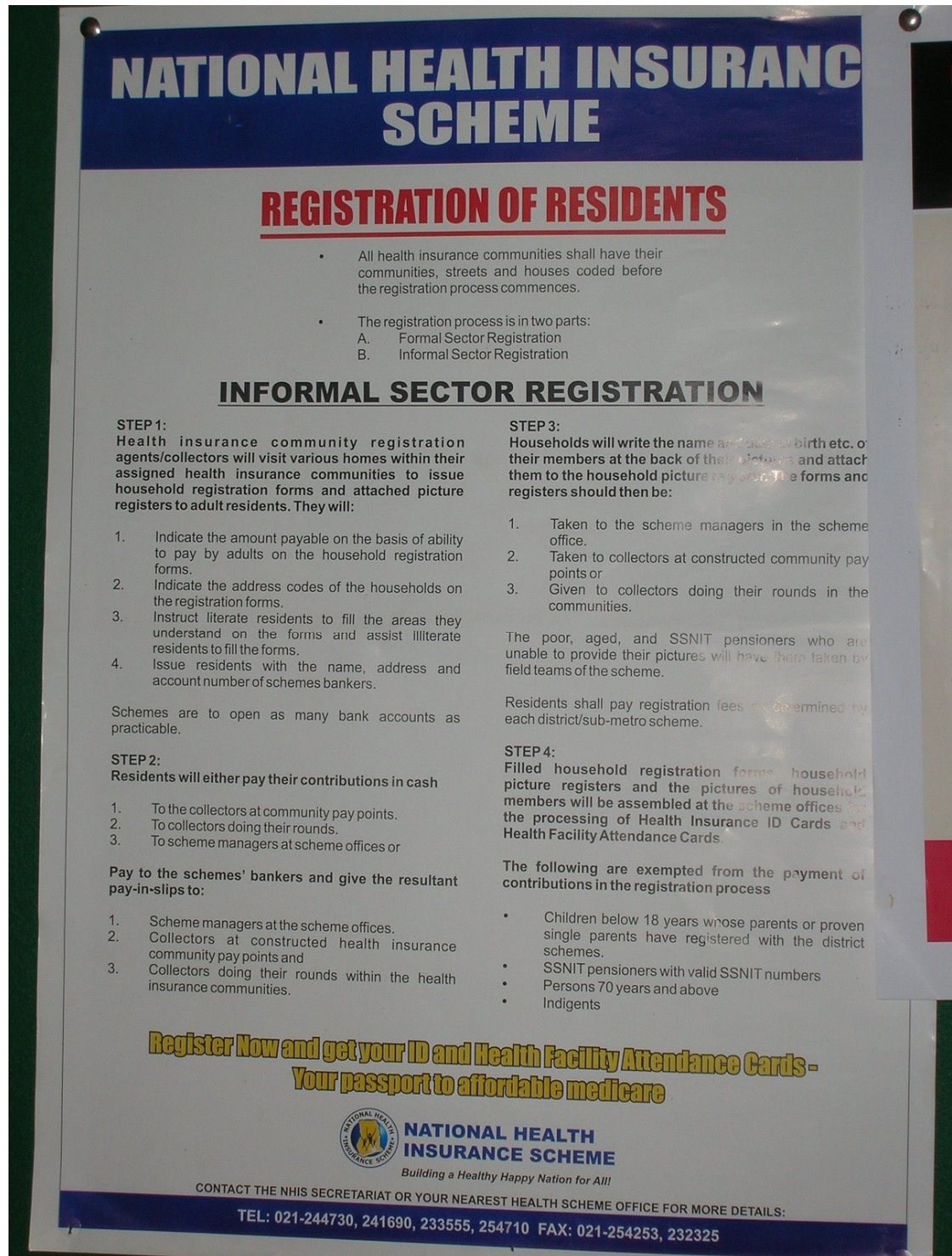
<sup>120</sup> Eunice Adei, MD., Conversation with author, June 2008.

For Ghanaian mothers, access to quality health care within the cities and the surrounding rural communities is an enduring challenge. Ghanaians have responded to the glaring need for improved services for mothers, infants and children. The sixty percent of Ghanaians who live in rural communities now overcome this barrier with the assistance of the Ghana Health Service and other local initiatives.<sup>121</sup> For the remaining forty percent of Ghanaians, who live in the nation's cities, inaccessibility is often linked with mothers' assumptions that medical services will be unaffordable. Local doctors and nurses are appalled by the number of Ghanaians who do not take advantage of the assistance program offered by the Ghanaian government. Ghanaians can apply for a certificate through a governmental fee exemption scheme, which serves as a kind of insurance policy for families. With generous financial support from the British government in 2007, mothers can also obtain free pre-natal care.<sup>122</sup>

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<sup>121</sup> In Dzolo-Kpuita, a team of Ghanaian nurses, volunteers and doctors set up a mobile clinic on the grounds of a permanent women's health clinic. Young Ghanaian women with rounded bellies watched from the porch of the small maternity ward. Minding a Ghanaian woman's many daily duties, this clinic served as a haven for these mothers who would not have had the opportunity to receive such nursing attention or rest otherwise. The travel expenses and the time required to visit a hospital in the city was not a luxury they could afford.

<sup>122</sup> Dogbevi, *Doctor-patient ratio in Ghana to worsen as financial crisis deepens*.



**Image 10: Poster explaining the steps to obtain a National Health Insurance card**  
Photo taken by Alli Honenberger

With the influx of city-dwellers in recent years, there are a greater number of malnourished children living near major hospitals requiring rehabilitative services. While transportation is not an issue for these urban families and urban children suffering from severe *kwashiorkor*, hospitals lack the accommodations and personnel to meet the rising demands. Under the current system, malnourished children are funneled to specialized nutritional rehabilitation centers or mothers are given home-based therapy foods. One facility where mothers can bring their children for food therapy is the Nutrition Rehabilitation Center of the Princess Marie Louise Children's Hospital in downtown Accra, Ghana. The personnel there provide malnourished children with two meals a day and educate mothers on how to prepare nutritious meals with simple food items found at home.<sup>123</sup>

### **Public Health Initiatives and PEM Prevention**

Beyond medical endeavors to heal those suffering from protein malnutrition, people outside the health care field have executed economic development campaigns and food aid programs to fight malnutrition. While these international efforts to combat PEM have consistently saved the lives of *kwashiorkor* victims, local initiatives have a greater potential for improving community-wide health and generating sustainable programs focused on prevention, rather than treatment. For instance, the work of Ghanaians to establish an extensive network of remote area clinics and their efforts to integrate community nurses and doctors into the official health care system will continue to empower mothers and address the root causes

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<sup>123</sup> UNICEF, *At a Glance: Ghana*.



of *kwashiorkor*.<sup>124</sup> Mothers who were previously unable to obtain health services for their children due to cost or physical distance from a provider, are now able to access medical professionals in either the clinical setting or their own homes through the work of outreach nurses who visit village families at regular intervals.



**Image 11: A nurse speaks to a group of village women.**

Photo taken by Alli Honenberger

The community nurses and physicians under the Ghana Health Service are some of the nation's most active local agents dedicated to enhancing the quality and accessibility of health services for women and children. The Ghana Health Service (GHS), established in 1996, is an autonomous agency charged with the hefty task of implementing national health policies. Independent of governmental offices, GHS employees are able to carry out their duty to Ghanaian people with greater administrative flexibility. The GHS staff has the following mission: "To establish a

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<sup>124</sup> Abdul Sesay, Interview with author, July 2008.

more equitable, efficient, accessible and responsive health care system.”<sup>125</sup> One of the core functions of the Public Health division of the Ghana Health Service, currently directed by Dr. Joseph Amankwa, is:

The provision of maternal, adolescent, child and reproductive health and nutrition services through the development of collaborative strategies with other service providers.<sup>126</sup>

One particularly successful policy promoted by the administrators of the GHS was the medical fee exemption for pregnant women, children under the age of five, and the very poor – the three sectors of the population most vulnerable to malnutrition.<sup>127</sup> The Ghanaian government introduced user fees in 1985, a time when the health care sector was suffering from lack of resources and patient utilization. Fees inhibited women from accessing medical services and acted as a barrier shared by the rural families and poor urbanites. Public health officers and health care providers are challenged with the task of providing quality care for the poor while generating revenues to increase the quality and availability of services.

The GHS strives to provide affordable, accessible, and excellent medical services for all Ghanaians. While this aim is noble and largely prevention oriented, many West Africans view prevention through education to be the most effective

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<sup>125</sup> Ghana Health Service, “Public Health Service: Core functions.” [online database] Available from: <http://www.ghanahealthservice.org/aboutus.php?inf=Background>

<sup>126</sup> Ghana Health Service, “Public Health Service: Core functions.” [online database] Available from: <http://www.ghanahealthservice.org/division.php?dsion=Public&nbsp;Health&dd=29>

<sup>127</sup> S. Witter, D. Arhinful, A. Kusi, and S. Zakariah-Akoto, “The Experience of Ghana in Implementing a User Fee Exemption Policy to Provide Free Delivery Care” *Reproductive Health Matters* 15, no. 30 (2007): 61-71.

means of combating *kwashiorkor* in Ghana.<sup>128</sup> Local doctors and community health workers are beginning to step-up initiatives to educate mothers about optimal weaning practices and the ways of combining local foods to provide their children with the essential amino acids during development. UNICEF Representative Souleymane Diallo expressed this notion well,

Exclusive breastfeeding during the first six months and good weaning practices are the easy but life-saving messages we share with mothers. It is a way of keeping children in good nutritional health and away from the feeding centers. In the long term, children and families should not become dependent on them. <sup>129</sup>

Historically, prevention has been largely neglected for the promotion of public health campaigns aimed at meeting immediate needs with material aid. In the years ahead, international aid workers should listen to local opinions and form partnerships with local organizations and individuals, who may then act as committed and familiar advocates for mothers and their children. There is hope in the story of *kwashiorkor* as the effects of the disease can be reversed through proper nutritional rehabilitation. Foreigners joining the battle against *kwashiorkor* should promote the use of local crops in the generation of therapy foods. Education about these treatments and prevention programs are dependent on mothers' access to health care and maternal education. International aid workers can help fight *kwashiorkor* by partnering with local health care providers to improve the quality and accessibility of medical services. Finally, the focus of all interventions should be

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<sup>128</sup> Local perspective, obtained through literature search and personal communication.

<sup>129</sup> Willemot, *Funds needed urgently to fight malnutrition in mauritania*.

on local wisdom and sustainable prevention, rather than foreign initiative and acute treatment.

## Chapter 3: Ghanaian Culture and the Battle Against

### *Kwashiorkor*

#### Age, Gender, and Family Dynamics

Ghanaian mothers make many important decisions concerning family nutrition, and thus fulfill a critical role in overall health of Ghanaian youth. In infancy and early childhood, mothers provide nourishment both to the prenatal fetus and the nursing infant. As children grow up, they learn about proper nutrition from mothers and female relatives, who also instruct younger women in food preparation.<sup>130, 131</sup> In this way, women are primarily responsible for the generational transmission of cultural ideas about healthy eating habits. Serving as the primary role models for their children, Ghanaian mothers essentially raise the nation's future leaders in the knowledge of caring for oneself and providing for others. Typically, West African mothers are more present in a child's early life.<sup>132</sup>

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<sup>130</sup> Fran Osseo-Asare interviewed Dinah Ayensu, the author of *The Art of West African Cooking*, a Ghanaian woman who published the first edition of her cookbook in 1972. They discussed the oral tradition of West Africa and the expectation that women know how to prepare the basic recipes without a cookbook. Women learned by watching their mothers, aunts, and older sisters prepare the meals, and by the age of thirteen, most young women knew how to make the staple dishes. When asked if this way of passing down cooking wisdom orally and by example would change, Dinah responded, "No, it's still going on. It's still going on right now." Fran Osseo-Asare and Dinah Ayensu, *BETUMI: Traditional and contemporary African cuisine*. Available from: <http://www.betumi.com/lib/ayensu-interview.html>

<sup>131</sup> According to Ghanaian tradition, women did not write down or use recipes when cooking. If a woman did, others would assume she did not know how to cook. Also, many dishes do not involve precise cooking times or measurements. J. S. Salm and Toyin Falola, *Culture and customs of Ghana*. (Westport, Connecticut: Greenwood Press, 2002): 106.

<sup>132</sup> Gbessy Sesay, Interview with author, July 2008.

| Mothers' education | Type of mortality |      |           |           |           |
|--------------------|-------------------|------|-----------|-----------|-----------|
|                    | NN                | PNN  | ${}_1q_0$ | ${}_4q_1$ | ${}_5q_0$ |
| No education       | 33.8              | 32.3 | 66.1      | 69.3      | 130.8     |
| Primary            | 41.1              | 29.2 | 70.3      | 45.4      | 112.5     |
| Middle/JSS         | 28.6              | 24.9 | 53.5      | 39.9      | 91.3      |
| Secondary          | 10.5              | 26.3 | 36.8      | 23.9      | 59.8      |
| Total              | 32.3              | 28.9 | 61.2      | 52.4      | 110.4     |

**Figure 6: Correlation between Maternal Education and Infant Mortality in Ghana, 1999**  
 NN-neonatal mortality; PNN- post-neonatal mortality;  ${}_1q_0$ -infant mortality;  
 ${}_4q_1$ -child mortality;  ${}_5q_0$ -under-five mortality.<sup>133</sup>

Mothers are key agents in *kwashiorkor* prevention because of their role in the transmission of ideas about healthy eating and their function in providing nutritious meals to their children, from conception through adulthood. While fathers share the responsibility for maintaining the family's nutritional health, it is the intimate link of maternal health and education with the development, treatment and prevention of *kwashiorkor* that make mothers key informants for foreign aid workers.

Ghanaian mothers tend to wean their children between the ages of one and two years, although the practice varies widely within the nation's ten regions. When mothers become pregnant with another child, they may choose to wean the first infant sooner than they customarily would. Premature or abrupt weaning, as a leading factor in *kwashiorkor* development, is linked to Ghanaian family structure and the incidence of close consecutive pregnancies. The social changes that

<sup>133</sup> Ghana Statistical Service and Macro International Inc. (GSS/MI) 23, (1999): 85.

accompanied twentieth century trends, such as urbanization<sup>134</sup>, modernization and globalization, led to a decline in the number of Ghanaian mothers choosing to breastfeed and the average weaning age. Health care providers are working to counteract these shifting attitudes and practices. Their efforts are evidenced in the abundance of posters and pamphlets on the walls and in the waiting rooms of private offices, hospitals and clinics in Ghana.<sup>135</sup>



**Image 12: UNICEF Poster promoting breastfeeding found on the wall of the Volta Regional Hospital**

Photo taken by Alli Honenberger

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<sup>134</sup> In 1995, the UN estimated that 37% of Ghanaians were living in urban areas. This is a significant increase from the 29 % that were living in Ghana’s cities in 1970. Adlakha, *International population brief: Ghana*.

<sup>135</sup> Through my field work in Ghana, I was able to tour three hospitals and several clinics. In all these facilities breastfeeding posters and pamphlets were present, such as the one depicted above.

Not dissimilar to the practices of mothers throughout the world, when Ghanaian women stop offering breast milk to an infant they begin feeding the child with staples of the adult diet. In Ghana, the adult diet rarely provides adequate amounts of the nine essential amino acids needed for nervous system development and growth in young children. Unlike older children and adults, infants who consume the starchy staples of West African cuisine are unable to ingest a large enough volume to meet their nutritional requirements for protein. However, children may “grow out” of *kwashiorkor* by surviving until they have sufficient body mass to meet these protein needs by eating larger quantities of grains, vegetables, and legumes. Even with this hopeful prospect, there remains a critical period, during which an infant starved of sufficient protein is prone to developing *kwashiorkor*. It is important to note that mothers are responsible for providing the necessary nutrients to their infants through the breast milk long before making decisions about weaning. While nursing, mothers must fulfill their own nutritional needs. Otherwise the breast milk will be depleted in nutrients and the health of the nursing child will be compromised.

Just as Ghanaian mothers need to understand the biological importance of their own nutritional health and its affect on nursing infants, outsiders need to be familiar with Ghanaian culture and eating practices. Like all mothers, those in Ghana want the best for their children and aim to abide by the recommendations of physicians, family, and friends. Still many find it difficult to implement the advice they receive. When you ask an educated Ghanaian mother about proper child nutrition, she will probably tell you proudly about her cooking and the food she



prepares daily for her family. She understands the basic importance of balancing carbohydrates, protein, and vitamins.<sup>136</sup> Ghanaian mothers generally feed their families according to local culture and well-established beliefs. Family dynamics, birth order, gender roles, and food taboos all affect the choices they make. If Ghanaian mothers are informed about the importance of protein in their young children's diet and encouraged to respect scientific truths along with social customs, they can reduce the childhood risk of *kwashiorkor*.

The intricate dynamics of the Ghanaian family influence eating practices. Throughout history, Ghanaians have placed value on kin relationships and prioritized the maintenance of family ties within and beyond the nuclear family. From of this community-oriented structure emerges an "economy of affection," defined as:

A network of support, communications and interaction among structurally defined groups connected by blood, kin, community or other affiliations, [such as] religion.<sup>137</sup>

Through this moral economy of sorts, poor families gain an assurance of support, both in everyday matters and in the cases of emergency, in which their very livelihoods may be threatened. Beginning in the 1980's and continuing into modern day Ghana, affection networks among Ghanaians are breaking down, largely in response to economic crises. As poverty spread in the 70's and 80's, a Ghanaian's ability to support others within this network declined. In the face of financial

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<sup>136</sup> Anonymous Ghanaian mother of four living in Sowutoum of North Kwashieman, Accra, Interview with author, June 2008.

<sup>137</sup> Goran Hyden, *No Shortcuts to Progress: African Development Management in Perspective*, (Berkeley: University of California Press, 1983): 8.

difficulty, rural farmers abandoned their enterprises in the country to seek work opportunities in the cities. Consequently, the distance across which reciprocities were required to span increased. During these years, Ghanaians built affective networks on increasingly diverse sources.<sup>138</sup> The support offered within the suffering Ghanaian economy was not strong enough to meet families' needs for assistance with living costs, hospital bills, and school fees. Pregnant mothers had once been surrounded by female relatives, whose wisdom guided the one with child through the before, during, and after phases of childbirth. Now, mothers find it more difficult to obtain family support.<sup>139</sup>

During the 1970's and 80's Ghanaians also witnessed a decline in educational spending and the nutritional status of children. Between 1979 and 1983, Ministry of Health data indicates a forty percent decline in utilization of health services. Government spending on social and welfare programs fell by more than ten percent in one decade. Per capita spending on education plummeted from twenty dollars in 1972 to a mere one dollar in 1983. According to a 1986 national nutrition survey, fifty-eight percent of Ghanaian children under age five were under the international weight-for-age standard, and thus classified as undernourished. Combined *kwashiorkor* and *marasmus* incidence stood at eight percent, a record proportion among all the nations of the world.<sup>140</sup>

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<sup>138</sup> In contrast to the diversification of Ghanaian affection networks, the neighboring people of Ivory Coast experienced a nuclearization of family.

<sup>139</sup> Hyden, *African politics in comparative perspective*, 89.

<sup>140</sup> Lavy, *Quality of health care, survival and health outcomes in Ghana*, 335.

The constant shifting of Ghanaian politics has also contributed to the weakening of extended families. As the government gained strength and adopted more responsibility in the allocation of resources, the importance of kinship networks diminished.<sup>141</sup> Ghanaian peasants shifted away from their dependence on horizontal reciprocities, such as those with peers and relatives, and began to seek more vertical alliances with employers and benefactors. As family systems deteriorated in the 1980's,<sup>142</sup> Ghanaians started to establish a greater number of non-kin reciprocities. Farmers, once providing for their families via subsistence agriculture now tried their hand at cash crops. A segment of the population entered into trading relationships, while others moved to the city to engage in formal negotiations or work under the management of strangers. With these rapid changes, Ghanaian mothers had to discover new ways of providing nutritious meals for their families.<sup>143</sup>

Throughout these transitions, Ghanaians have continued to emphasize a deep respect for the elderly. This sentiment is found in various West African cultures, as this cultural principle translates into preferential treatment for older relatives who still dine with the nuclear family. The partiality shown toward elderly Ghanaians may come at the expense of young Ghanaian children. Many West Africans are struck by the emphasis placed on youth in the United States. One student from Sierra Leone recounted stories she had heard from her mother about

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<sup>141</sup> Hyden, *African politics in comparative perspective*, 89.

<sup>142</sup> Hyden, *African politics in comparative perspective*, 151.

<sup>143</sup> Hyden, *African politics in comparative perspective*, 89.

growing up as an orphan: After the adults served themselves the protein and fiber-rich dishes, the kids received a *mondo*, or ‘handful,’ of what remained. Motioning with her hand to imitate the scoop, the daughter inspired an image of her mother as a small child holding her palms up for the meager ration.<sup>144</sup>

As the kinship ties in Ghana loosen, the impact of age dynamics is less relevant to the battle against *kwashiorkor*. However, gender roles continue to influence Ghanaian eating practices and shape mothers’ decisions about childhood nutrition. The customary roles assigned to mothers and fathers in Ghana reveal the importance of empowering mothers in the battle against *kwashiorkor*. Mothers serve as the principal meal preparers, from the moment their children are born, through the months of breastfeeding, and even into adulthood. Mothers’ tasks within the home and kitchen have been largely preserved despite increasing involvement of Ghanaian women in wage-earning endeavors.<sup>145</sup> A 2006 World Bank report included the following endorsement for the link between maternal behavior and the nutritional status of children:

Improving maternal knowledge, feeding, and time for care during pregnancy and lactation and improving infant feeding and caring practices, such as exclusive breastfeeding and adequate and timely complementary feeding, is critical to improving nutrition outcomes. These tasks are closely linked to issues of gender.<sup>146</sup>

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<sup>144</sup> Isata Sesay, Interview with author, July 2008.

<sup>145</sup> Shiyan Chao, “Ghana: Women’s role in improved economic performance,” *Findings of the The World Bank Group* no. 145 (1999). Available from: <http://www.worldbank.org/afr/findings/english/find145.htm>

<sup>146</sup> Meera Shekar, *Repositioning Nutrition as Central to Development: A Strategy for Large-Scale Action Vol. 2006/283/HD*, (Washington D.C.: The World Bank, 2006): 61. Available from: <http://go.worldbank.org/SMKCQFEJ60>

In many West African nations, and in much of the developed world, fathers assume the role of primary wage earner.<sup>147</sup> As fathers fill this conventional role, meal preparers may serve them larger portions out of gratitude, a sense of obligation, or custom. When meat is served, the eldest male reserves the right to the best portion, yet he is required to leave a small amount for the children of the household to eat at a later time.<sup>148</sup> Ghanaian mothers may remain responsible for feeding their sons even after they find a wife. A man may continue living in his mother's home with his bride while contributing to the household income for several years after marriage. The number of male consumers residing in a home is likely to affect the availability of food for infants and children.

In addition to her concern for feeding older relatives and adult males in the home, mothers must also meet the needs of the youngest members of the household, their newborn infants. The nutritional requirements of older siblings are too often neglected due to the new baby's greater dependence on breast milk; in this way, birth order is linked to *kwashiorkor* incidence. More often, older siblings are the victims of PEM, and children who are first, second, or third in the family's birth order appear to be more susceptible to *kwashiorkor*.<sup>149</sup> Women respond to and shape all these aspects of Ghanaian culture. At the same time, that culture and its

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<sup>147</sup> Chao, *Ghana: Women's role in improved economic performance*.

<sup>148</sup> J.S. Salm and Toyin Falola, *Culture and customs of Ghana* (Westport, Connecticut: Greenwood Press, 2002): 106.

<sup>149</sup> L. Adekunle, "The effect of family structure on a sample of malnourished urban Nigerian children," *Food And Nutrition Bulletin* 26, no. 2 (2005): 230-233.

associated practices concerning family nutrition also influence mothers' decisions about child weaning and food allocation.

### **Local Beliefs and Communication about Food**

Ghanaian mothers influence the diet of her children by their adherence to cultural beliefs concerning food and healthy eating. Speaking with local people, especially mothers, about these views will grant international aid workers an inside perspective on what notions are at odds with the science of nutrition and how to best educate mothers and their children. Mothers pass along taboos to their children about the danger of sickness and death when one eats particular foods at certain times and in specific combination. For example, a constituent of Ghanaian mothers refuse to feed their young children eggs, one of the cheapest form of protein available to Ghanaians, for fear of spoiling them with rich foods and leading them to develop an indulgent appetite.<sup>150</sup> One Nigerian man chuckled to himself as he remembered a time during his daring boyhood when he simultaneously ate ripe mango and gari, a powder made from grated fermented cassava. His mother and other adults in the community had warned their children that this blend was a recipe for disaster. He thankfully walked away from his meal without ill effect.<sup>151</sup>

When implementing public health campaigns to combat *kwashiorkor*, outsiders must also understand the way Ghanaians communicate about food. For

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<sup>150</sup> Rosemond Katsekor, Interview with author, June 2008.

<sup>151</sup> Doyin Folarin, Interview with author, July 2008.

example, Ghanaians generally only recognize traditional dishes as “real food,”<sup>152</sup> while Western-style foods are considered “snacks.” Despite the growing foreign influence on Ghanaian food ways, the soup and stew meals of the Gold Coast remain at the heart of Ghanaian cuisine.<sup>153</sup> In her interview with Ghanaian chef Dinah Ayensu, the author of “The Art of West African Cooking,” North American sociologist Fran Osseo-Asare discusses several unique eating practices and ways of communicating about food seen in Ghanaian culture. Dinah shares,

“There are people who will say they haven't eaten the whole day, simply because they haven't had their soup and *fufu*. If you give them anything-- bread sandwich, Caesar salad, they don't consider it as food, until they've sat down with their bowl of *fufu* and soup. Or fish and kenkey for the Gã (the Gã people).”<sup>154</sup>

Fran reveals her own experience in the field,

“In fact, it happened to me in Ghana. I was doing my research for my dissertation. We were interviewing people about what they had to eat – it was 24 hour recall. And people would say... ‘I only ate once today.’... Then you find out, they ate all day long, but the only one they counted was the heavy one. So I'm very sensitive to that.”<sup>155, 156</sup>

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<sup>152</sup> Salm, *Culture and customs of Ghana*, 107.

<sup>153</sup> Salm, *Culture and customs of Ghana*, 105.

<sup>154</sup> Osseo-Asare, Fran, and Ayensu, Dinah. BETUMI: Traditional and contemporary African cuisine. 20032009]. Available from <http://www.betumi.com/lib/ayensu-interview.html>.

<sup>155</sup> Osseo-Asare, *BETUMI: Traditional and contemporary African cuisine*.

<sup>156</sup> I noticed this same pattern while working in the mobile clinic. When I asked the patients, “What did you have for your last meal?” most replied with one of only a handful of traditional dishes. Upon noticing this repetition, I assumed that those dishes were the only options available to the villagers and that they lacked variety in their diet. After reading several Ghanaian and West African accounts about local eating practices, I realize that this assumption is not accurate and that it is instead a matter of how Ghanaians choose to communicate about their eating practices.



**Image 13: Volunteers with the mobile clinic ask patients about their last meal.**  
Photo taken by Alli Honenberger

Ghanaians eat cereals and root vegetables, such as maize, yams, sweet potatoes, and cassava, on a daily basis. Each of these staples serves a different function by offering varying amounts of the nine essential amino acids,<sup>157</sup> in addition to various vitamins and minerals.

| Country             | Sorghum |      | Millets |      | Maize |      | Rice |     |
|---------------------|---------|------|---------|------|-------|------|------|-----|
|                     | 1       | 2    | 1       | 2    | 1     | 2    | 1    | 2   |
| <b>Benin</b>        | 80      | 100  | 11      | 23   | 349   | 427  | 161  | 12  |
| <b>Gambia</b>       | -       | -    | 38      | 35   | 12    | 13   | 33   | 40  |
| <b>Ghana</b>        | 142     | 210  | 73      | 230  | 420   | 350  | 79   | 83  |
| <b>Guinea</b>       | 15      | 7    | -       | -    | 63    | 55   | 330  | 380 |
| <b>Ivory Coast</b>  | 35      | 53   | 48      | 82   | 300   | 615  | 550  | 475 |
| <b>Liberia</b>      | -       | -    | -       | -    | -     | -    | 216  | 180 |
| <b>Mali</b>         | -       | -    | 930     | 1420 | 80    | 90   | 142  | 172 |
| <b>Niger</b>        | 273     | 982  | 1117    | 303  | 9     | 12   | 38   | 23  |
| <b>Nigeria</b>      | 3835    | 6025 | 3230    | 5050 | 1580  | 1746 | 1241 | 600 |
| <b>Senegal</b>      | -       | -    | 750     | 850  | 55    | 49   | 120  | 80  |
| <b>Sierra Leone</b> | 11      | 7    | 9       | 9    | 14    | 13   | 400  | 400 |
| <b>Togo</b>         | -       | -    | 107     | 170  | 137   | 120  | 20   | 21  |
| <b>Upper Volta</b>  | 750     | 1200 | 400     | 900  | 100   | 100  | 29   | 40  |

**Figure 7: 1981 estimates of cereal production in West African countries**  
1 - Production x metric tons; 2 - Area under cultivation x 1000 hectares <sup>158</sup>

<sup>157</sup> The nine essential amino acids are: histidine, isoleucine, leucine, lysine, methionine (and/or cysteine), phenylalanine (and/or tyrosine), threonine, tryptophan, and valine.

<sup>158</sup> Radomír Lásztity, Máté Hidvégi and International Association for Cereal Chemistry, *Amino Acid Composition and Biological Value of Cereal Proteins: Proceedings of the International Association for*



Mothers should make a point of alternating these items in a weekly menu to ensure that they and their families consume foods that offer a variety of vitamins, minerals and proteins. Many families in Ghana eat one kind of starch more consistently due to taste and texture preference as well as availability. Because each starch is deficient in one or more of the essential amino acids – for maize, this is lysine and tryptophan – Ghanaian children on an exclusively maize diet have an increased risk for developing *kwashiorkor*.<sup>159</sup>

It is also critical for aid workers to recognize that Ghanaian people are diverse and that the popular diet varies across regional and ethnic divides. The coastal groups, such as the Gã, and the Ewe of the Volta region rely mainly on maize in the preparation of their starchy staples, *kenkey* and *banku*. Northern Ghanaians have retained the use of sorghum and millet to a greater extent than the Southern coastal peoples, where their most typical dish is *tuo zaafi*.<sup>160</sup> The Asante of south-central Ghana join many other West African ethnic groups in frequent consumption of *fufu*, a region-wide favorite typically prepared from a combination of non-maize starches. If foreigner aid workers understand these specific beliefs and preferences, they will be more equipped to address the unfavorable practices found in Ghana today.

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*Cereal Chemistry Symposium on Amino Acid Composition and Biological Value of Cereal Proteins*, May 31-June 1, 1983 (Budapest, Hungary: Springer, 1985): 29.

<sup>159</sup> Ghana Medical and Education Departments, *Ghana Nutrition and Cookery*, 6<sup>th</sup> ed. (Edinburgh: Thomas Nelson and Sons, Ltd., 1962).

<sup>160</sup> Salm, *Culture and customs of Ghana*, 108.

## Infrastructure and Growth

The specific infrastructure and population growth of Ghana affect mothers' ability to prevent *kwashiorkor*. Lack of infrastructure has been a limiting factor for the development efforts of many sub-Saharan Africans. The poor state of roads, electricity, water, railways, ports, and communication puts the people of Africa a harsh disadvantage. The growing dependence on primary commodity export and the failure to attract foreign investment has greatly limited African development.<sup>161</sup> While Ghanaians are not estranged to the challenges known to the people of non-industrialized nations, they are more fortunate than many on the African continent on account of the Akosombo Dam, built in 1965 through a partnership of early-independence leaders and international funding agencies.<sup>162, 163</sup>

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<sup>161</sup> Hyden, *African politics in comparative perspective*, 18.

<sup>162</sup> One evening, as we returned to our accommodations after a solemn ride through the market, where we saw the urban homeless sleeping on the sidewalks, our friend, a student in Accra, looked out the passenger seat window as he said, "You see, Ghana is blessed with light." We followed his gaze, peering out of the back windows to see street lamps and porch lights along the road. It wasn't until the third week of our stay in Ghana that we had a chance to visit the source of that light and all of Ghana's energy, the Akosombo Dam.

<sup>163</sup> "Akosombo Dam," *Encyclopædia Britannica Online*, (2009). Available from: <http://www.britannica.com/EBchecked/topic/11743/Akosombo-Dam>



**Image 14: Akosombo Dam with the Volta Lake in the background**  
Photo taken by Alli Honenberger

The Akosombo Dam provides enough energy to give electricity to all of Ghana and a number of communities in bordering nations. As citizens now benefit from the energy produced from Ghana's water sources, Ghanaian mothers living near these sources use fish as a source of protein in their cooking. Mothers living in the northern regions do not have this assurance of a protein source. Due to their inland position and the aridity of northern Ghana, they even face additional barriers to providing protein for their children. For these reasons and others, the prevalence of *kwashiorkor* is significantly high among residents of the three northern regions of Ghana, Upper East, Upper West, and Northern. The percentage of people suffering from acute malnutrition in these regions can be greater than twice the national average.<sup>164, 165</sup>

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<sup>164</sup> Rosemond Katsekor, Interview with author, June 2008.

| Source (age group)                                      | Date                       | Geographic Area (region) | Severe Wasting (% < - 3 z-score) | Wasting (% < - 2 z-score) | Stunting (% < - 2 z-score) | Underweight (% < - 2 z-score) |
|---|----------------------------|--------------------------|----------------------------------|---------------------------|----------------------------|-------------------------------|
| Multiple Indicator Cluster Survey (MICS)<br>0-59 months | August/<br>October<br>2006 | National                 | 0.9                              | 5.4                       | 22.4                       | 17.8                          |
|   |                            | Upper East               | 2.8                              | 11.6                      | 28.4                       | 29.1                          |
|   |                            | Upper                    | 0.3                              | 7.7                       | 22.5                       | 19.1                          |
|   |                            | Northern                 | 1.1                              | 7.1                       | 30.5                       | 26.8                          |
|   |                            | Volta                    | 2.1                              | 4.8                       | 20.9                       | 20.3                          |
|   |                            | Greater                  | 1.1                              | 3.1                       | 7.7                        | 9.8                           |
|   |                            | Central                  | 0.0                              | 3.7                       | 26.4                       | 16.3                          |

**Figure 8: Undernutrition Rates of Priority Regions in Ghana** <sup>166</sup>

While fish provide an extra source of protein in Ghanaian cuisine, it is through agricultural and trade that Ghanaians garner the majority of their foodstuffs. In all realms of food acquisition, the population pressure that Ghanaians began to feel in the 1990's and beyond has impacted the ability of mothers to ensure proper nutrition for their children.<sup>167</sup> The population of Africa as a whole is growing at a rate faster than that of any other major world region; Africans are predicted to represent 21 percent of the world population by 2050, where they made up just 9 percent in 1950. Ghana is one of the most populous countries in sub-Saharan Africa, with Nigeria as the first. There were approximately 6 million people in Ghana at the

<sup>165</sup> Community-Based Management of Acute Malnutrition, *Planning CMAM services at the district level*, Module 7 (2007). Available from: [http://www.fantaproject.org/downloads/pdfs/CMAM\\_tPH7\\_v1.pdf](http://www.fantaproject.org/downloads/pdfs/CMAM_tPH7_v1.pdf)

<sup>166</sup> "Ghana Multiple Indicator Cluster Survey," *Ghana Statistical Service*, February, 2007. Available from: [http://www.fantaproject.org/downloads/pdfs/CMAM\\_tPH7\\_v1.pdf](http://www.fantaproject.org/downloads/pdfs/CMAM_tPH7_v1.pdf)

<sup>167</sup> Codjoe, *Supply and Utilization of Food Crops in Ghana*.

time of independence in 1957. By 1996 that number had almost tripled to nearly 18 million. Today, there are roughly 23 million people who call Ghana home.<sup>168, 169</sup>

Ghanaian mothers continuously create, perpetuate and respond to their cultural, socio-political and economic environment carrying out their daily activities and the choices they make for their households are influenced by the broader cultural values and standard of living within Ghana. Ghanaians, like many of their West African neighbors, place great value on the family unit. Family dynamics affect local eating practices and ultimately the nutritional health of Ghanaian children. Foreigners should become familiar with the interactions between family members and the local values that shape those relationships. Those wishing to engage in the battle against *kwashiorkor* must understand the local culture and context in which the disease prevails. Through conversations with local people and an exploration of the primary literature, foreigners gain an awareness of the barriers they may face when implementing a public health campaign and the potential avenues for effecting change. Through partnerships with those intimately involved in the decisions that cause and prevent *kwashiorkor*, namely Ghanaian mothers, outsiders can be a part of a change that is sustainable.

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<sup>168</sup> World Health Organization, "Ghana Profile" *WHO*. Available from: <http://www.who.int/countries/gha/gha/en/>

<sup>169</sup> Adlakha, *International population brief: Ghana*.

## Chapter 4: Local Perspectives on Future Campaigns

### International Campaigns to Combat *Kwashiorkor* in the Twenty-First Century

International aid workers boast a noble past and active present in the battle against protein-energy malnutrition, and they continue to set lofty goals for the future. In September of the year 2000, world leaders from a hundred and eighty-nine nations gathered in New York City for the United Nations Millennium Summit. There they outlined their objectives for bettering the lives of the world's poor by the year 2015 by developing a set of eight Millennium Development Goals (MDGs). Through MDG 1, the members articulated their hope to halve the number of undernourished people in the world by the year 2015. In the decade preceding 2002, the number of malnourished people in the world fell from 824 to 820 million, a miniscule decrease in light of the multitudes still suffering. Progress toward reaching MDG 1 is slow. While the rates of undernutrition have waned in Asia, Latin America and the Caribbean, the number of Africans battling hunger and malnutrition has actually risen.<sup>170</sup>

Four years prior to that grand assembly in New York City, those in attendance at the 1996 World Food Summit in Rome, Italy made the following assessment,

Availability of enough food for all can be attained. The 5.8 billion people in the world today have, on average, 15 percent more food per person than the

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<sup>170</sup> World Hunger Facts 2009, "Progress in reducing the number of hungry people," Available from: <http://www.worldhunger.org/articles/Learn/world%20hunger%20facts%202002.htm>

global population of 4 billion people had 20 years ago. Yet, further large increases in world food production, through the sustainable management of natural resources, are required to feed a growing population, and achieve improved diets. Increased production, including traditional crops and their products, in efficient combination with food imports, reserves, and international trade can strengthen food security and address regional disparities. Food aid is one of the many instruments which can help to promote food security. Long term investment in research and in cataloguing and conserving genetic resources, particularly at the national level, is essential. The link between sufficient food supplies and household food security must be ensured.<sup>171</sup>

The authors of the Summit's "Plan of Action," the document in which this excerpt is found, endorse food aid as a component of food security, and so it has been in past campaigns. On the other hand, the emphasis on sustainability via the development of natural resources has been neglected at times. Both of these endeavors require capital, an essential element in every public health endeavor. With continued funding and innovation from members of the international community, people in developing nations can offer their extensive knowledge of local culture and practices to aid in the battle against *kwashiorkor*. Political instability and the volatile environment in West Africa dictate trends in child nutrition and welfare. While these factors are intricate and largely uncontrollable, locally-informed campaigns against endemic *kwashiorkor* can help to relieve the burden of malnutrition that has plagued the people of Ghana and the world for centuries.

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<sup>171</sup> "Plan of Action," *World Food Summit, November 13-17, Rome, 1996*. Available from: [http://www.fao.org/WFS/index\\_en.htm](http://www.fao.org/WFS/index_en.htm)

## **Food Aid and the Culture of Dependence**

In the past, international aid workers have consistently employed food aid campaigns in an attempt to alleviate hunger and malnutrition. Many in West Africa agree that foreign operations to feed Africans have their place in the modern age and in the face of a surmounting global food crisis, but they also stress that the ultimate goal should be empowerment of the African people, subsistence, and locally-inspired, sustainable change. Former campaigns carried out on the continent and consistent with these recommendations offer perspective for the future endeavors of foreigners wishing to join the battle against *kwashiorkor*.

In July of 2001, the Organization of African Unity (or the African Union, as it is called today) constructed the strategic framework of the New Partnership for Africa's Development (NEPAD). Two of the four primary objectives of the NEPAD are "to place African countries, both individually and collectively, on a path of sustainable growth and development" and "to accelerate the empowerment of women." NEPAD representatives also uphold the international aims outlined at the UN Millennium Summit, dedicating themselves to "monitoring and intervening as appropriate to ensure that the Millennium Development Goals in the areas of health and education are met." Since 2001, local officials have partnered with the UN to implement the NEPAD school feeding program, which aims to provide one square meal to poor rural children, encourage school attendance, and allow students to achieve 'sound minds' for their studies. Ghana is one of ten countries in Sub-Saharan Africa participating in the program, which began in January 2006. For the program's first phase, which will last for 5 years, select schools within metropolitan, municipal



and district assemblies (MMDA) are implementing the program. The campaign designers limited its scope to primary schools, where a significant proportion of children are vulnerable to malnutrition, particularly the two predominant forms of PEM, *kwashiorkor* and *marasmus*. By the end of the first phase in 2010, an estimated two million Ghanaian children will have benefited from the program.<sup>172</sup>

Another campaign called Integrated Nutrition Action Against Malnutrition (INAAM), which began in May 2007 is sponsored almost entirely by outside agencies. The program's proposed emphasis on the use of local resources would set it apart from traditional food aid schemes. Funded by UNICEF and the Catholic Relief Service (CRS), the engineers of this campaign sought to combat malnutrition in eight districts within Ghana's three Northern regions through a one-year intervention. The mediators of this project worked to rehabilitate thousands of children using a Ready-to-Use Therapeutic Food (RUTF) called "plumpy-nut."<sup>173</sup> Four of the eight districts were positioned in the Upper West region, where one medical consultant estimated the infant mortality rate to be 208 per 1,000, or roughly twenty percent.<sup>174</sup> The implementers' intended to teach local mothers how to make RUTF mixtures so they could continue feeding their children with local foodstuffs. In this way, Ghanaian mothers could meet the protein requirements of their children, even

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<sup>172</sup> "The NEPAD School Feeding Programme" on *ghanadistricts.com*. Available from: [http://www.ghanadistricts.org/home/?\\_=14&sa=3019&PHPSESSID=af27c1e8a53191bfb18702198275daa4](http://www.ghanadistricts.org/home/?_=14&sa=3019&PHPSESSID=af27c1e8a53191bfb18702198275daa4)

<sup>173</sup> UNICEF, "Activities and results for children." On *Unite for Children*. Available from: [http://www.unicef.org/infobycountry/ghana\\_1878.html](http://www.unicef.org/infobycountry/ghana_1878.html)

<sup>174</sup> Edward Gyader, M.D., "Upper West Launches Nutritional Project," *The Ghanaian Times*, June 2007. Available from: <http://www.newtimesonline.com/repair/content/view/9931/194/>

after the withdrawal of foreign aid workers. The Head of Programs of the Catholic Relief Service (CRS) in Ghana, Daniel A. Ayugane, recognized this truth, as he asserted, “Community participation is key to the success and sustainability of the government school feeding program.” In spite of the aid group’s goals, Ghanaian families have still developed a dependence on the presence of CRS staff.<sup>175</sup> A news article from the WA East District revealed,

The Catholic Relief Service is closing down its Food Assisted Child Survival (FACS) and School Feeding Programmes in the districts by September 2008...As a result, it no longer distributes food to the schools on regular basis...This has led to children dropping out on daily basis due to lack of food to retain them in class.<sup>176</sup>

Although the culture and context affecting *kwashiorkor* prevalence vary across doorsteps, regional lines, and national borders, foreign aid workers should also study campaigns executed outside West Africa to inform future efforts in Ghana. The Ethiopian partnership with the UN in 2003 is one example of a distant campaign from which West Africans can gain insight into successful designs. Local and foreign powers combined to address the nutritional deficiencies that cause children life-long challenges and disabilities. It is celebrated as one of the most comprehensive anti-malnutrition programs on the African continent, and it serves as a worthy model for other efforts. Those who devised this program were wary of

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<sup>175</sup> “School enrolment threatened,” Karaga, on *ghanadistricts.com*. Available from: <http://www.ghanadistricts.com/news/?read=14544>

<sup>176</sup> “Pre schools closing down,” Wa East, on *ghanadistricts.com*. Available from: <http://www.ghanadistricts.com/news/?read=14192>

the dependence bred through food handouts, and chose to instead emphasize prevention and education to achieve sustainable change and healing.<sup>177</sup>

Although West Africans advocate food aid in emergency response, as in the case of famine, drought, or political unrest, they stress the importance of directly delivering donations to the intended recipients within these campaigns. They counsel foreign aid workers against trusting West African governments with the distribution of donations, and advocate door-to-door delivery of food aid.<sup>178</sup> While current West African political administrations claim varying degrees of trust from their citizens, government executives of the past have dishonestly sold food aid in local markets and used the profit for selfish ends. By selling the food intended for the poor in the market, those without sufficient food or income remain unable to afford food for their families. In this way, the original purpose of the outreach is entirely lost. In the most constructive anti-*kwashiorkor* initiatives, foreign patrons join forces with local people to address the nutritional needs identified by the latter. By silently delivering goods from a distance, well-meaning Americans can actually promote a spirit of dependence that will only have an adverse affect on the futures of West African youth.

Additionally, transportation and distribution costs necessitated by the modern structure of food aid usurp funds that could otherwise contribute to more efficient anti-malnutrition initiatives. In 2007, shipping and distribution costs

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<sup>177</sup> Michael Wines, "Malnutrition Is Cheating Its Survivors, and Africa's Future," *The New York Times*, December 28, 2006, Special Reports.

<sup>178</sup> Isata Sesay, Interview with author, July 2008.

amounted to approximately 40 percent of food aid expenditure. The primary benefactors of the current system are the agricultural shareholders of exporting nations and shipping companies, such as Mitsui, Maersk and American President Lines.<sup>179</sup> Experts maintain that the transportation costs involved in delivering food to West Africa eliminate the effectiveness of the aid scheme altogether.<sup>180</sup>

### **Agricultural Research at the Local Level**

In the future, foreign proponents of change can apply resources more effectively by investing in the development of West African agricultural technology, promoting research on local crops, sponsoring the work of local farmers, and marketing local products at fair price on the global market. In this way, outsiders stand alongside West Africans and empower them to bring lasting change to their communities. This direction is more beneficial to those suffering from *kwashiorkor* than the promotion of food aid provided by large-scale farm-holders in developed nations. Senegalese president, Abdoulaye Wade, firmly denounced the current system of food aid, or 'charity,' calling instead for 'help-to-stand-up' policies. Westerners should listen closely to West African voices such as these and work to erase the stereotype of the helpless African.<sup>181</sup>

On-site agricultural research has the potential to drastically expedite the development of farming technology in Ghana and reduce the incidence of

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<sup>179</sup> Laurie Garrett, "Food Failures and Futures," (working paper for the Maurice R. Greenberg Center for Goeconomic Studies, Council on Foreign Relations, NewYork, NY, May 15, 2008): 5.

<sup>180</sup> Rory Carroll, "Zambians starve as food aid lies rejected," (Siatumbu, Zambia: The Guardian, 2002). Available from: <http://www.guardian.co.uk/science/2002/oct/17/gm.famine1>

<sup>181</sup> Laurie Garrett, *Food Failures and Futures*, 7.

*kwashiorkor*.<sup>182</sup> Dr. Ian Pearson, the United Kingdom's science minister, voiced his opinion on the role of genetically modified (GM) maize in Africa:

"I think that the public wants to see benefits for GM technology for the consumer, not just for the fertilizer company or the farmer. If GM can demonstrably provide benefits for people living in sub-Saharan Africa then I think the public will want to support those as products and want to see them commercialized."<sup>183</sup>

As food crises threaten the lives of more than 14 million people in just six of the fifty-two African nations as a result of drought, floods and bad policies, the question of whether or not to adopt GM maize on the continent remains. The technology to produce durable strains of staple crops exists in the Western world, but due to economic challenges, has not yet been developed in Africa. While these plants may hold promise as a sustainable solution in the face of an escalating food crisis, West Africans should carefully consider the implications and possible consequences of embracing GM crops which will primarily come to them as donations from the US. Just as Europeans and Ghanaians could not anticipate the consequences of maize's original introduction to the West African coast, aid workers and local people today may not be able to judge the effects of GM corn on the environment, trade, and human health in Ghana.<sup>184</sup>

Ultimately, international aid workers should listen to the local perspective on agriculture to learn the technologies suited best for the Ghanaian context.

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<sup>182</sup> Francis Idachaba, *The Political Economy of Hunger: Endemic Hunger, Vol. III*, eds. Jean Drèze and Amartya Sen (Oxford: Clarendon Press, 1991), 218-223.

<sup>183</sup> James Randerson, "Drought resistant GM crops ready in four years," on *guardian.co.uk*, (Wednesday October 7, 2008). Available from: <http://www.guardian.co.uk/environment/2008/oct/07/gmcrops.food>.

<sup>184</sup> Carroll, *Zambians starve as food aid lies rejected*.

Foreigners can boost production and self-sustainability by empowering local farmers, developing local crops, and endorsing local initiatives.

### **Education is Key**

Education, in the classroom, doctor's office and home, is critical to every child's success. Ghanaian mothers represent the most present and influential role models for their children. Thus, mothers' beliefs and decisions about breastfeeding, weaning, and nutrition directly affect the health of their offspring. International leaders hoping to aid in the battle against *kwashiorkor* should empower local women and focus on improving local services offered by the Ghanaian educational and health care systems. Avoiding the promotion of Ghanaian dependence on foreign aid should be a top priority as these leaders go forward. With the consideration of local wisdom and the promotion of local initiatives, Westerners can break the culture of dependence and the spirit of inferiority that plagues Ghana and many of its West African neighbors.

Local leaders will indefinitely be a part of this process. They can help to lift their fellow countrymen out of the vicious cycle of malnutrition and poverty by preventing the unhealthy reliance on outsiders. Before Europeans arrived on the African continent in the fifteenth century, Ghanaians flourished and brilliantly manipulated their environment to meet their nutritional needs. They did not require aid from beyond their coasts. Today Ghanaians possess the acumen and resources needed to restore their health and education sectors. And they have the heart to see their children thrive. The international community must recognize these truths. As aid workers seek to understand the Ghanaian perspective on healthy eating,

Ghanaians will simultaneously profit from Western ideas. With the ultimate goal of partnership in these campaigns informed by local and international wisdom, education is key.

Even Williams' recognized the importance of education in solving the problem of *kwashiorkor*. In her 1933 article, she includes in her discussion of prevention methods this exhortation,

“The educationalists might well devote time to teaching their pupils how to obtain milk, butter, and cheese from [goats], and include information on hygiene and feeding in the educational syllabus.”<sup>185</sup>

School teachers, physicians, nurses, and parents are all effective teachers in the battle against PEM. While a portion of *kwashiorkor* victims in Ghana acquire the disease as a result of poverty and the inability to afford protein foods, too often they fall ill as a consequence of ignorance about available local protein sources. In Ghana, where the land is fruitful and the people are hard-working, shortages are generally isolated to seasons of famine, flood, or political unrest. The investment of time and energy in learning campaigns will reap greater benefits than even the most abundant harvest in African history.

Many schools in modern Ghana simply present students with the “option” of taking a class on healthy eating, but few require such a course. Such classes, as they exist today, teach young Ghanaians about the importance of balancing carbohydrates, vitamins, and proteins. As one West African declared, “Nutrition

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<sup>185</sup> Williams, *Kwashiorkor: A Nutritional Disease of Childhood Associated with Maize Diet*, 432.

should be instilled because kids won't forget. The charts definitely help. It would definitely work."<sup>186</sup>



**Image 15: Nutrition should be universally taught to Ghanaian primary school students. Here a group of first grade boys sing their national anthem.**

Photo taken by Alli Honenberger

Beyond the classroom, another strategy for reducing the common but preventable risk of *kwashiorkor* is for community nurses and health educators to

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<sup>186</sup> Doyin Folarin, Interview with author, July 2008.



instruct and counsel pregnant women about proper weaning practices and the importance of eating well themselves. Historian Adell Patton expresses the need for this cooperation between education and health care,

“In West Africa, as almost everywhere else, nutrition must be taught because children suffer from malnutrition generation after generation. In all of these initiatives the medical profession at all levels of society must be involved.”<sup>187</sup>

A young nurse at Narh-Bita hospital in Tema, Ghana expressed the need to educate mothers about the supplementing starchy foods with cowpeas, groundnuts, beans and other locally produced crops that provide the essential amino acids during child development.<sup>188189</sup> Educational schemes to curb PEM should not exclusively focus on teaching nutrition in the classroom and the doctor’s office. For mothers who don’t have access to either of these, community nurses play a critical role. These instructors should communicate to parents at their homes about the long-term risks to children who suffer from protein malnutrition during development. Teachers should also educate parents about the nutritional requirements they have as adults. Empowered with this knowledge, mothers and fathers can act as a team, departing from customary eating practices when it is advantageous for their children.

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<sup>187</sup> Patton, *Physicians, Colonial Racism and Diaspora in West Africa*, 43.

<sup>188</sup> Anonymous nurse at Narh-Bita Teaching Hospital, Interview with author, June 2008.

<sup>189</sup> Benjamin Spock, Interview by Milton J. E. Senn, November 20, 1974, interview 67A, transcript, Senn Oral History Collection, National Library of Medicine, Bethesda, MD.

## Conclusion

Foreign aid in Ghana has a long history, beginning with colonial interest, proceeding through the change-laden twentieth century, and continuing into the modern era of African independence. Members of the international community concerned with the pervasiveness of *kwashiorkor* in West Africa must acknowledge that local wisdom and initiative is essential for successfully combating protein-energy malnutrition and producing sustainable change. This overarching objective calls for the promotion of local health care and education services for women and children,<sup>190</sup> as well as the investment in developing local resources. Hearing the African perspective on previously instituted interventions against PEM is critical to understanding what has been successful in the past, what has not, and what can be done in the future to better address this health dilemma.

Most of the international campaigns aimed at combating *kwashiorkor* in place today target poverty and starvation as the root cause of malnutrition. Foreign agencies have good intentions as they launch economic ventures and deliver food aid; however, these strategies suffer for not emphasizing prevention and local sustainability. Too often Westerners have approached their aid endeavors with misconceptions about the Ghanaian people, and Africans in general. It is critical that foreigners and West Africans work together to discredit these false notions as they build lasting and healthy relationships in the battle against *kwashiorkor*. Outsiders may approach Africans with pity and consider the problem of malnutrition too

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<sup>190</sup> Willemot, *Funds needed urgently to fight malnutrition in mauritania*.

immense to overcome. All the while, West Africans wish the Western world would stop sighing, “Oh poor, poor Africa” and see that Africa has so much more to offer.<sup>191</sup> Ghanaians do not need pity. The greatest gifts the world can give them are listening ears and helping hands, ready to join them in their battle for improved childhood nutrition.

Mothers’ concern for their children is a powerful force for change. Ghanaian mothers are passionate about seeing their children well fed and healthy. Accompanied by an acute understanding of the context of *kwashiorkor* in Ghana, the spirit and commitment of these women is an invaluable component to any effective public health campaign against protein-energy malnutrition. Empowering women to make informed decisions will greatly aid in the battle against PEM. As the present issue of *kwashiorkor* in Ghana is complex and spans a wide and varied landscape – physical, political, cultural, and economic – it is impossible to summarize the nature of the disease across the entire nation or to propose a generalized solution. The hope of swiftly curing all those suffering from *kwashiorkor* is unrealistic. Yet the hope of empowering Ghanaian mothers to produce lasting change is within reach. Outsiders endeavoring to combat *kwashiorkor* should partner with Ghanaians and seek to grasp the perspectives, practices, and expertise of the local people to inform future campaigns.

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