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Caitlyn L. Lutfy Date

A Human Rights Violation: Malnourished Refugee Children in Camps and After US Resettlement

By

Caitlyn Lutfy

Master of Public Health

Department of Global Health

_____

Dr. Roger Rochat

Committee Chair

_____

Dr. Susan Cookson

Committee Member

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Caitlyn Lutfy

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Thesis Committee Chair: Roger Rochat, MD, MPH

An abstract of

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Abstract

A Human Rights Violation: Malnourished Refugee Children in Camps and After US Resettlement

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Background: Identifying and addressing nutrition issues among US-resettling refugee children are a human rights issue. **Methods:** The target population is children from Burma, Bhutan, Somalia, Liberia, Eritrea, Sudan, Burundi, and the Democratic Republic of Congo 6-59 months of age who live in secondary country camps prior to US-resettlement. Analysis of camp child nutrition data informs pre-arrival nutrition conditions. A survey of Refugee Health Coordinators provides information on nutritional assessment, reporting and referrals in domestic refugee medical screening. **Results:** Half of the camps had global acute malnutrition prevalence rates over 15% at least once from 2004-2010. Camps collecting anemia data had greater than 40% prevalence. The majority of State-regulated refugee health exams include height and weight measurements but few use National Center for Health Statistics or WHO standards. **Recommendations**: Improve overseas monitoring and data linkages of nutrition information to US-resettlement services. Domestically, adopt standards for nutrition assessment and referral protocols.

Length: 149 words

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Contents

Definitions

Refugee- Any person who is outside the country of his [or her] nationality or, if he [or she] has no nationality, the country of his [or her] former habitual residence, because he [or she] has or had well-founded fear of persecution by reason of his [or her] race, religion, nationality or political opinion and is unable, or because of such fear, is unwilling to avail him [or her]self of the protection of the government of the country of his [or her] nationality, or, if he [or she] has no nationality, to return to the country of his [or her] former habitual residence.[1]

Resettlement-the selection and transfer of refugees from a State in which they have sought protection to a third State which has agreed to admit them – as refugees – with permanent residence status. The status provided ensures protection against *refoulement* (forced repatriation) and provides a resettled refugee and his/her family or dependants with access to rights similar to those enjoyed by nationals. Resettlement also carries with it the opportunity to eventually become a naturalized citizen of the resettlement country.[2]

ACRONYMS

DOS- Department of State

FAO – Food and Agricultural Organization of the United Nations

IOM- International Organization for Migration

NCHS- National Center for Health Statistics of the Centers for Disease Control and Prevention

ORR- Department of State's Office of Refugee Resettlement

PRM- Department of State's Bureau of Population, Refugees, and Migration

UNHCR- United Nations High Commissioner for Refugees

UNICEF- United Nations Children's Fund

WFP- World Food Program

WHO- World Health Organization

INDICATORS

Edematous malnutrition (or kwashiorkor) - a severe form of protein-energy malnutrition characterized by bilateral pitting edema, the retention of water in the tissues of the body. This is measured by pressing thumb on the tops of the child's feet for three seconds; if impressions remain after a few seconds of removing the thumb, the child is edematous.[3]

GAM- Global acute malnutrition; prevalence of wasting at a population level

MUAC- Mid-upper arm circumference, determined by using specific tape measure

Severe Wasting- a weight-for-height z-score of <-3

Wasting- a weight-for height z-score of <-2

Z-Score-The z-score system expresses the anthropometric value as a number of standard deviations below or above the reference mean or median value. A fixed z-score interval implies a fixed height or weight difference for children of a given age. The formula for calculating the z-score is:

> Z-score (or standard deviation [SD]-score) = (observed value - median value of the reference population) / standard deviation value of reference population[4]

Chapter I Introduction

Introduction and Rationale

Annually, the US resettles roughly 75% of the world's refugees referred by the Office of the United Nations High Commissioner for Refugees (UNHCR) for third country resettlement.[5] From 2005-2009, the US admitted approximately 300,000 refugees. Of these, nearly 50% came from protracted refugee settings, defined as:

> "a situation in which refugees find themselves in a long-lasting and intractable state of limbo. Their lives may not be at risk but their basic rights and essential economic, social and psychological needs remained unfulfilled after years in exile. A refugee in this situation is often unable to break free from forced reliance on external assistance"[1,6]

This term is often defined as refugee camps resided in for greater than 5 years. In recent years, UNHCR and international agencies noted high rates of child malnutrition, both stunting and wasting, in protracted refugee camps.[7]

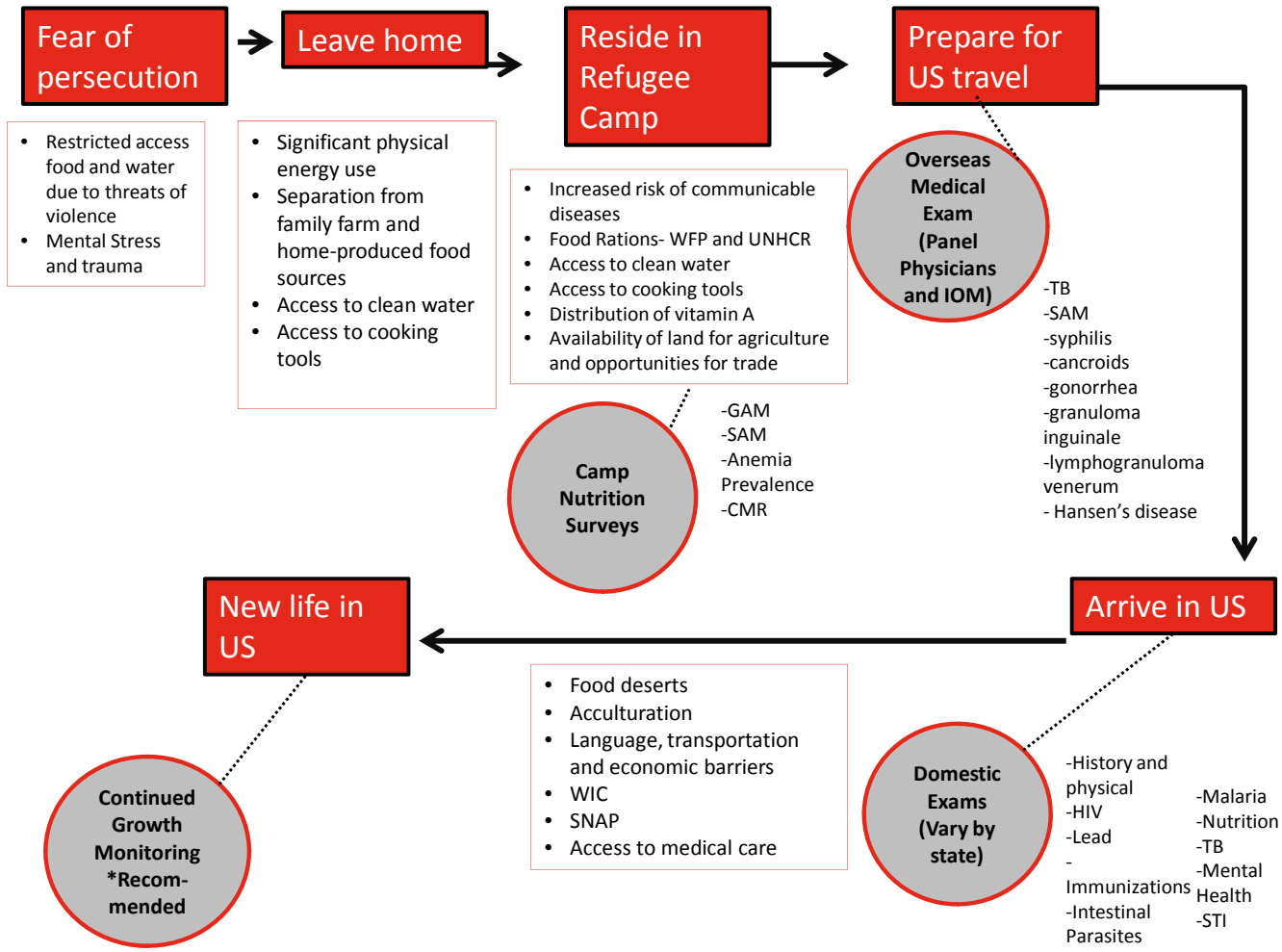
The US-resettled refugee experience includes three major temporal phases: 1. traveling across national borders fleeing persecution, 2. living in refugee camps, and 3. adjusting to a new life in the US. Each of these phases brings risks to adequate nutritional attainment; however, there are opportunities to detect and address nutritional deficiencies along this journey (see Figure 1). This report presents findings from child nutrition surveys conducted in refugee camps to identify nutritional risks and needs of children who resettle in the US from camps. We present survey results on nutrition assessment, referral patterns and services offered in conjunction with state-run domestic medical screenings in selected resettling states. First, a review of contemporary

peer-reviewed literature and relevant data on refugee nutritional indicators collected in the US will inform a hypothesis about the relationship between the nutrition profiles in camps and the nutrition and health outcomes of refugees after resettlement.

Problem Statement

The US is signatory to several international conventions that hold States accountable to ensure the ascertainment of appropriate nutrition and to the 1999 Committee on Economic, Social and Cultural comment No. 12 on the "right to adequate food" among its populations. [8] Malnutrition, among children under 5 years of age, causes adverse developmental and health outcomes. Proper nutritional restoration often requires clinical assistance. However, little is known about the nutrition status of US-resettled refugee children. From both a public health and a human rights perspective, additional knowledge is needed to ensure the "right to adequate food," and to inform services for resettling refugee children in the US, particularly those entering in a malnourished state.

Figure 1. The Journey of the Refugee from fleeing persecution to establishing a new life in the US: Barriers to nutrition and opportunities for surveillance and intervention.



Red solid boxes= stages of the refugee journey from fleeing country of origin to establishing a new life in the US
Red outlined boxes= Factors influencing nutrition status
Gray Circles= opportunities for assessment, surveillance and intervention
Dashed lists= indicators currently collected at the point of assessment

Research Objectives

The purpose of this thesis is the following:

1. Provide analysis and description of the nutrition profiles among the eight top camp-based resettling populations entering the US between 2005 and 2009 using camp-level nutrition survey data.
2. Describe the relationship between nutritional status in camps and the potential health outcomes associated with childhood malnutrition among these eight US-resettled refugee populations by reviewing the literature and presenting personal communication of the nutrition status of a small domestic sample of refugee children.
3. Examine current State and local practices in assessing and addressing refugee nutrition.
4. Provide recommendations and considerations for domestic medical exams, State and local refugee agencies, and pediatricians working with refugee children.

Significance

The UNHCR recognizes approximately 10.4 million refugees worldwide and oversees three different solutions for refugees: repatriation, local integration, or third-country resettlement.[9] Resettlement is considered the durable solution for refugees who are unable to safely return to their country of origin without threat or fear of persecution.

UNHCR refers about one percent, or approximately 800,000-1,000,000, refugees for resettlement each year. Ten percent of those referred (around 80,000-100,000) successfully undergo resettlement.[10] The US takes 70-75% of this population, in recent years, accepting around 70,000 per year. Prior to resettlement, many refugees spend years living in protracted refugee camps while their final destination is determined. In 2008, 8.5 million refugees spent

over five years in camps and 8.2 million surpassed 10 years in camp residencies.[11] The experiences of refugees− from the situations in their countries of origin, through their travels seeking refuge, to the living conditions in refugee camps− pose many threats to health and nutrition.[12] Approximately 50% of all refugees entering the US between 2005 and 2009 came from protracted refugee camp settings (camps in existence for at least 5 years).

Malnutrition and micro-nutrient deficiencies prevail in many refugee camps. In some cases, the populations depend solely on general food rations distributed by the World Food Program (WFP) and UNHCR. Even with these rations, barriers to access and delivery of rations, absence of fuel and necessary cooking means, inadequate nutritional composition of rations, inappropriate feeding practices, shortages in program resources, and increased rates of infectious diseases contribute to the continued presence of malnutrition in protracted camps.

Global acute malnutrition (GAM) is a population-based nutrition indicator assessed by measuring the height and weight of all or a sample of children 6-59 months of age. [13]Children with a weight-for-height index of greater than two-standard deviations (or two z-scores) below the population mean are characterized as "wasting." The GAM rate of the population is the proportion of children who are wasting.[13] The means and z-scores used to assess for wasting and calculate the GAM prevalence in the surveys aggregated for this thesis use the World Health Organization's growth standards.[13] GAM prevalence of greater than 10% is considered serious and beyond the UNHCR threshold of acceptability. The UNHCR/WFP's 2006 report presented unacceptable malnutrition rates in camps in Chad (18% GAM), Eritrea (18.9% GAM), Ethiopia (19.6% GAM) and Sudan (18% GAM).[14] UNHCR and the WFP expressed concern for the high rate of malnutrition and micronutrient deficiencies (referred to as "hidden hunger") in protracted refugee settings.[14]

Nutritional deficiencies, particularly during childhood, contribute to poor outcomes in cognitive and physical development, and chronic diseases such as diabetes, cardio-vascular disease and obesity, which inhibit the future economic productivity and self-reliance of refugees.[15] Malnourished children are two to eight times more likely to die from common childhood diseases and poor childhood nutrition is associated with intergenerational poverty and malnutrition.[7,15]

Approximately 3-6 months prior to resettlement, refugees undergo a mandatory overseas health screening; the majority, 70% are conducted by the International Organization for Migration (IOM). While prioritizing the detection of communicable diseases, IOM routinely assesses anthropometric indicators in the overseas medical exam.[16] Although IOM discussed intentions of referring malnourished children for treatment before resettlement, these coordinated activities have not been systematically implemented or documented (Personal communication, Tarissa Mitchell, DGMQ, CDC, 20 November 2011). Within their first three months of resettling in the U.S., the majority of refugees receive domestic health examinations used to assess for diseases of public health concern (mainly communicable diseases). The Centers for Disease Control and Prevention (CDC) recently recommended the inclusion of a nutrition assessment in the new arrival screenings; however, exam protocols fall under the auspices of State governments and designated State refugee health coordinators with funding controlled by the Office of Refugee Resettlement (ORR), thus CDC guidelines are not regulatory.

In 2000, Bureau of Population, Refugee and Migration (PRM) and UNHCR established a formal partnership "to provide protection, humanitarian assistance, and durable solutions to UNHCR's beneficiaries."[17] In the documented framework for partnership, "freedom from hunger and malnutrition" is considered a human right.[17] Therefore, it is critical that child nutrition and

development receive attention upon and following resettlement. The long-term health consequences of childhood malnutrition among refugees, including developmental impairment, stunting, obesity and diabetes,[18-21] can and should be prevented through the detection of malnourished children and the nutritional restoration and management upon resettlement.

CHAPTER II Background and History

Who are Refugees?

While the terms "refugees," "asylees" and "internally displaced people" are subject to different regional definitions in legislation, for the purpose of this paper, refugees are defined according to the UNHCR 1950 mandate. Paragraph 6B defines refugees as:

> "Any other person who is outside the country of his [or her] nationality or, if he [of she] has no nationality, the country of his [or her] former habitual residence, because he [or she] has or had well-founded fear of persecution by reason of his [or her] race, religion, nationality or political opinion and is unable, or because of such fear, is unwilling to avail him [or her]self of the protection of the government of the country of his [or her] nationality, or, if he [or she] has no nationality, to return to the country of his [or her] former habitual residence."[2]

The population of concern for this thesis exclusively comprises of refugees referred by UNHCR to resettle in the US. UNHCR defines resettlement as:

> "the selection and transfer of refugees from a State in which they have sought protection to a third State which has agreed to admit them – as refugees – with permanent residence status. The status ensures protection against *refoulement* and provides a resettled refugee and his/her family or dependants with access to rights similar to those enjoyed by nationals. Resettlement also carries with it the opportunity to eventually become a naturalized citizen of the resettlement country."[2]

These definitions exclude individuals and groups who enter the US directly from their country of origin, such as Haitians and Russians. Out of the top 20 countries of origin among refugees resettling in the U.S. from 2005-2009, those from 12 of these countries were likely to live in camps outside that country before US resettlement. Survey data were available from the camps housing refugees from eight of these countries of origin.

Table 1 Top 20 Countries of Origin among US Refugee Arrivals, 2005-2009

Country of Origin	# Arrivals 2005-2009	% of Total Arrivals
Burma*	43673	15.7%
Iraq	34444	12.4%
Somalia*	34074	12.3%
USSR	30720	11.0%
Cuba	21402	7.7%
Iran	20738	7.5%
Bhutan*	18564	6.7%
Thailand*	9688	3.5%
Laos	9541	3.4%
Liberia*	9495	3.4%
Vietnam	9291	3.3%
Burundi*	8840	3.2%
Sudan*	5785	2.1%
Ethiopia	4679	1.7%
Eritrea*	3528	1.3%
Democratic Republic of Congo*	3501	1.3%
Afghanistan	2631	0.9%
Sierra Leone	1640	0.6%
Republic of Congo	784	0.3%
Rwanda	732	0.3%
TOTAL	273750	98.5%

Those coming from second-country camps are in bold. Total US arrivals from 2005-2009= 278,020

Source: http://www.acf.hhs.gov/programs/orr/data/refugee_arrival_data.htm

In this analysis we will use nutrition survey data for refugees from: Burma, Bhutan, Sudan, Somalia, Liberia, Eritrea, Democratic Republic of Congo, and Burundi. Refugees from these eight countries make up just fewer than 50% of the refugees arriving in the U.S. from 2005-

2009.[2] Assuming that the majority of those referred by UNHCR for US resettlement lived in second country refugee camp settings, information on these camps pertains to the medical history and health outcomes of these refugees resettling in the U.S.

A Brief History of Refugee Protections

World War II (WWII) resulted in an influx of refugees and internally displaced people worldwide. In response, the newly formed United Nations established the temporary International Refugee Organization (IRO, 1946-1952). By 1951 the United Nations decided to establish a permanent institution with treaty provisions on the status of refugees. Reflecting the 1948 adoption of the Universal Declaration of Human Rights that recognizes, "Everyone has the right to seek and enjoy in other countries asylum from persecution," the 1951 Convention established agreements with the signed States on the treatment of refugees.[22,23]

The United Nations High Commissioner for Refugees

The United Nations General Assembly established the Office of the United Nations High Commissioner for Refugees on December 14, 1950 with a three year mandate to address the ensuing refugee situation resulting from WWII. On January 28, 1951 the United Nations Convention relating to the Status of Refugees established the legal foundations and the preliminary statute for UNHCR's ongoing work.[23] The 1951 mandate set out that:

1. *The United Nations High Commissioner for Refugees, acting under the authority of the General Assembly, shall assume the function of providing international protection, under the auspices of the United Nations, to refugees who fall within the scope of the present Statute and of seeking permanent solutions for the problem of refugees by assisting Governments*

[2] HHS Data compiled

and, subject to the approval of the Governments concerned, private organizations to facilitate the voluntary repatriation of such refugees, or their assimilation within new national communities.

2. *In the exercise of his functions, more particularly when difficulties arise, and for instance with regard to any controversy concerning the international status of these persons, the High Commissioner shall request the opinion of the advisory committee on refugees if it is created.*
3. *The work of the High Commissioner shall be of an entirely non-political character; it shall be humanitarian and social and shall relate, as a rule, to groups and categories of refugees.*[24]

The 1951 Convention obliges signatory States to ascertain rights and protections to refugees within their territories covered in seven chapters. Chapter I, General Provisions defines the refugee.

The General Provisions include the provision of non-discrimination (Article 3) and religious rights (Article 4). Chapter II established juridical status including the Personal Status clause (Article 12). Chapter III outlines the rights to Gainful Employment. Chapter IV, the focus of this forthcoming paper, addresses welfare: Article 23 states contracting States must accord refugees in their territories with the same relief and assistance as nationals. Chapters V determines the administrative measures which institutes the use of identity papers and travel documents, regulates the transfer of assets and prohibits charging refugees any charges other than those required payment by nationals. Chapter VI and VII cover Executory Provisions and the Final Clause, respectively.[25]

In 1956, UNHCR faced its first humanitarian emergency in the Hungarian revolt. Decolonization of Africa in the 1960s cemented UNHCR's necessity to address both long-term and emerging humanitarian situations on a global level, pushing beyond its post-WWII foundations.[22]

Acknowledging the sustained and emerging needs of refugee populations, the 1967 General Assembly Resolution 2198 (xxi) developed the Protocol relating to the Status of Refugees which expanded refugee status applying the 1951 definition to all who fit the determination regardless of the January 1, 1951 dateline.[25] One-hundred and forty-seven countries are signatory to one or both the 1951 Convention and the 1967 Protocol. The US signed the Protocol only.[22]

Today UNHCR works in Latin America, Eastern Europe, Asia, and Africa addressing humanitarian emergencies. With a budget of $3.32 billion (USD) in 2011, UNHCR serves 36.4 million people of concern, including 10.4 million refugees worldwide.[23] Non-signatory countries hosting refugee populations in camp settings include: Eritrea, Ivory Coast, Afghanistan, Bangladesh, Indonesia, Nepal, Pakistan, Thailand and Sri Lanka. [26]

Operation and Services

UNHCR is governed by the United Nations (UN) General Assembly and the Economic and Social Council (ECOSOC). The High Commissioner, currently António Guterres, is appointed by the UN General Assembly and overseas an 85 member UNHCR Executive Committee responsible for approving the biennial programs and budget. UNHCR employs over 6,785 staff members in 125 countries; most field operations include camp management, staff recruitment, medical supply procurement, food shipment and aircraft charters.[27]

UNHCR's first prioritizes shelter for those fleeing their homes. Stockpiles of tents exist in three centers in Dubai, Copenhagen and Durban.[28] UNHCR leads in shelter assistance in conflict-generated displacement while the International Federation of Red Cross and Red Crescent Societies (IFCR) leads in shelter operations in natural disaster displacements. UNHCR also assists in the maintenance and expansion of shelters in protracted refugee settings.

Second, UNHCR prioritizes health services.[29] According to the 1951 convention "refugees should enjoy access to health services equivalent to that of the host population, while everyone has the right under international law to the highest standards of physical and mental health."[30] The health partner organization of UNHCR conducts interagency needs assessments to determine Primary Health Care (PHC) packages contextualized for each country. UNHCR schemes prioritize protection and primary health care assistance that is universally accessible to all in a community through full participation and at a cost affordable to the community in the spirit of self-determination (in accordance with the 1978 Declaration of Alma Ata). UNHCR also coordinates assess the needs for and coordinates access to secondary health care resources.

Thirdly, UNHCR co-sponsors the joint United Nations Program on HIV/AIDS, (UNAIDS) and serving as the lead agency for HIV care and treatment among refugees and internally displaced persons. Often accused of spreading HIV and excluded from local HIV/AIDS programs, refugees receive treatment, preventions and care programs through UNHCR.

UNHCR's Health Information System (HIS) monitors public health and HIV programming.[31] This system provides weekly and monthly surveillance information from protracted camp settings on morbidity and mortality, program indicators, and nutritional status of children enrolled in feeding centers.

UNHCR operates water and sanitation programs for refugee camps. UNCHR estimates that over 50% of refugees worldwide do not receive the minimum daily water requirements (20 liters per person) and 30% of camps do not have waste disposal or latrine facilities.[32] UNHCR sponsored projects include upgrading water and sanitation facilities, building monitoring systems in camps, and enhancing knowledge and practice of hygienic behaviors.

Fifth, UNHCR prioritizes education services for refugees, in support of the Millennium Development Goal of ensuring universal primary education by 2015. UNHCR collaborated in establishing the Inter-Agency Network for Education in Emergencies (INEE).[33] In collaboration with the German government, UNHCR awards annual Albert Einstein German Academic Refugee Initiative scholarships to thousands of young adults to attend universities and colleges in their host countries.

Finally, UNHCR works in partnership with the WFP and governmental and inter-governmental organizations to assess and provide nutrition in refugee settings.[34] UNHCR is the lead agency for these activities and trains partners, provides standard guidelines, and coordinates programs and staffing. UNHCR recognizes the synergistic link between malnutrition and communicable diseases in camps, associations between food shortages and exploitation and the negative consequences of childhood malnutrition on development. UNHCR's nutrition assistance and surveillance will be the focus of this report.

Nutrition Services in Refugee Camps Served by UNHCR

UNHCR utilizes standard technical guidelines to inform public health and nutrition interventions in complex humanitarian emergencies. The first technical guidelines on emergency nutrition were published in 1978 and the first textbook on refugee health was published in 1983.[35] During the 1980s, the association between malnutrition and mortality in refugee camps gained

attention. In the early 1990s, CDC published a series of reports on the epidemiology of complex emergencies and refugee health.[35] In 1997, the International Red Cross and Red Crescent Movement and non-governmental organizations in disaster relief established the Sphere Project, which published a Humanitarian Charter and Minimum Standards in Disaster Response.[36] The Sphere Project recommends multi-sector initial rapid assessment followed by more in-depth nutritional assessments. Initial nutrition assessments consist of three standard areas: food security assessments, nutrition assessments, and assessment of infant feeding practices.

The allocation and delivery of food must be carefully planned to avoid inclusion or exclusion errors or the potential misappropriation to combatants in the case of civil crisis. To increase acceptability and access, self-selection criteria and barriers to participation (such as lack of economic livelihood, old-age or disability) should be assessed and modified as needed.

The Executive Committee of the High Commissioner's Program states that "ensuring adequate nutrition and eliminating malnutrition form an essential part of protection, in particular for refugee children and refugee women."[37] UNHCR recognizes malnutrition not only as a physiological condition, but a human rights and resource issue.[14] In a June 2007 Standing Committee meeting on nutrition, UNHCR identified the protracted refugee situations in Kenya, Ethiopia, Chad, Bangladesh and Sudan to be of significant concern.[37]

In the past, the international community saw refugee camps as temporary environments. Correspondingly, international donations and emergency operations are often short-term. However, in 2008, an estimated 8.5 million refugees had lived in camps greater than five years and 8.2 million for greater than 10 years.[11] The reality of protracted refugee situations requires long-term care and assistance. Malnutrition during infant and child development and longer

periods of malnutrition during adulthood may cause chronic adverse health effects making it necessary to follow up on potential deficiencies.

Food Assistance Programs Systems and Regulations

In 1985, UNHCR and WFP signed a Memorandum of Understanding (MOU) on the Joint Working Arrangements for Refugee, Returnee and Internally Displaced Persons (updated in 1992, 1994, 1997, 2002 and 2011).[38] The MOU established the division of responsibility for needs assessment, food mobilization, logistics, appeals, monitoring and surveillance, reporting and coordination.

The WFP and UNHCR are committed to the restoration and maintenance of healthy nutritional status through general food rations, which meet assessed needs, are nutritionally sound and culturally acceptable. The MOU establishes a collaborative effort to provide food aid to refugees and internally displaced people in camps with greater than 5,000 people by targeting the household level. The strategy begins with a needs assessment and uses standards for energy, protein and micronutrient requirements established by Food and Agriculture Organization (FAO) and the World Health Organization (WHO).[39] WFP maintains responsibility for mobilizing basic food commodities and providing the resources for delivery in emergency situations. WFP provides the mission team leader and logistical staff while UNHCR provides a nutritionist and other mission support staff as needed. UNHCR maintains refugee-registration mechanisms and is responsible for determining the health status of refugees and the needs for supplemental feeding, such as therapeutic feeding programs. UNHCR and WFP agree to follow up directly with other agencies that have an important contribution to make in a particular situation: UNICEF in situations concerning mothers and children, FAO in situations where refugees may engage in

agriculture, fishery, forestry or livestock, and the International Labor Organization (ILO) where refugees may be able to engage in income-generating activities.[39]

UNICEF and WFP also signed an MOU, last updated in 2005, in commitment to the UN's Convention on the Rights of the Child, the Declaration and Plan of Action of the International Conference on Nutrition, the Convention to End All Forms of Discrimination against Women and to the achievement of the Millennium Development Goals.[40] The MOU establishes each agency's responsibilities in a cooperative strategy to cover needs assessments, monitoring and evaluation of services in areas of nutrition. Nutrition assessments include anthropometric and micronutrient measurements. While the WFP is responsible for general food distributions, food baskets are designed in accordance with UN guidelines on "Food and Nutrition Needs in Emergency 2002." Generally, UNICEF is responsible for technical support and training for survey design, surveillance and for providing non-food items in refugee settings, including items for food preparation and consumption.

Additionally, the FAO directs emergency agriculture programs to buy and deliver agricultural essentials, like seeds, tools, fishing gear, livestock and fertilizers and provide multiplication schemes. When budget constraints forced a severe reduction in WFP food rations to the 300,000 refugees in Tanzania in the early 1990s, FAO collaborated with UNHCR to distribute seeds and hand tools to 15,000 refugee families to plan community gardens. FAO noted marked decreases in indicators of malnutrition among the estimated 50,000 refugees directly benefiting from the project.[41] However in many refugee crisis settings, political and security conditions that restrict access to land present barriers to such livelihood reconstruction projects. Examples of especially restrictive settings include camps in Angola, Burundi, Nepal, Tanzania and around Khartoum.[39]

General and Selective Feeding Programs:

Feeding programs belong to two categories: general and selective. General food programs consist of the distribution of standard food baskets. Standard food baskets may be wheat-based, maize-based or rice-based depending on geographic location and cultural preferences. The following is an example of the contents and nutritional composition of a maize-based general food ration:

Table 2 Nutritional composition of maize-based food ration

Ration Contents	DAILY RATION g/person/day	ENERGY kcal	PROTEIN g	FAT g	CALCIUM mg	IRON mg	IODINE µg	VIT. A µg RE	THIAMINE mg	RIBOFLAVIN mg	NIACIN mg NE	VIT. C mg
White Maize Grain	400	1400	40	16	28	10.84	0	0	1.54	0.804	8.8	0
Dried Beans	60	201	12	0.72	85.8	4.92	0	0	0.3	0.132	3.72	0
Vegetable Oil	25	221.25	0	25	0	0	0	225	0	0	0	0
Corn Soy Blend	50	200	9	3	90.25	6.4125	0.75	250.7248	0.21775	0.34775	4.975	24.75
Sugar	15	60	0	0	0	0	0	0	0	0	0	0
Iodized Salt	5	0	0	0	0	0	300	0	0	0	0	0
RATION TOTAL	**555**	**2082.25**	**61**	**44.72**	**204.05**	**22.1725**	**300.75**	**475.7248**	**2.05775**	**1.28375**	**17.495**	**24.75**
% OF REQUIREMENTS IN TOTAL RATION		**99%**	**116%**	**112%**	**45%**	**101%**	**201%**	**95%**	**229%**	**92%**	**126%**	**88%**

*generated in WFP Nutval

A general food ration like this contains 2,100 calories, 58g of protein and 43g of fat. Fortified blended foods, such as the corn soya blend (CSB), are designed to provide micronutrients in the diets. However, fortified blended foods are not always included in the food basket. Baskets and guidelines are adapted to meet local circumstances, including age and gender composition, access to additional food sources, cultural acceptance of food groups, activity level and health status.[42] The WFP/UNHCR guidelines for estimating food and nutritional needs in emergencies recommend adjusting the total energy in rations by demographic distributions (age and sex), accounting for the number of pregnant or lactating women, assessing the Physical Activity Levels (PAL) and considering climate temperatures.[43]

For severely malnourished children, specially formulated products are used in the treatment: either therapeutic milks (F 75/F100) or more recently Ready-to-Use Therapeutic Foods (RUTF). Individuals with moderate acute malnutrition also receive specialized treatment with food designed to meet the nutritional needs of rehabilitation. When the prevalence of acute malnutrition becomes a significant problem on a population level, all vulnerable individuals (such as all children under 5 years of age and pregnant and lactating women) are targeted and enrolled into blanket supplementary feeding program. [42]

In reaction to a series of micro-nutrient deficiency-related disease outbreaks which occurred in refugee populations in the 1980s, the WFP and UNHCR adopted strategies to prevent such deficiencies in at-risk populations. The WFP mandates vitamin A fortification of vegetable oil and iodination of salt in food rations; currently, most rations include fortified blended foods. Less frequently used interventions include: promotion of fruit and vegetable production, provision of fresh food items in rations, provision of access to micro-nutrient rich foods (such as groundnuts for niacin).[42]

Nutritional Assessments and Surveillance in Refugee Settlements

UNHCR and the WFP conducted in-depth reviews of selected refugee camps (mainly in Kenya and Ethiopia) and identified the following determinants of sustained malnutrition in camps: poor infant and young child feeding practices, limited access to safe water and improved sanitation, insufficient access to cooking utensils and cooking fuel, and gender challenges.[14] In many situations, malnutrition was higher among women and girls due to gender-related cultural norms and linked to the increase of gender-based violence in refugee camps and limited mobility.[14] Poor nutrition in early childhood has been linked to intergenerational poverty and malnutrition.[14]

Refugees remain excluded from standard national nutritional surveys. However, in many cases the nutritional situation in refugee settings change drastically in a short amount of time depending on multiple factors, such as influx of new refugees, availability of resources and technical assistance, spread of disease, and external political situations. To address this gap in nutrition surveillance, the Administrative Committee on Coordination/Subcommittee on Nutrition (ACC/SCN) maintains the *Nutrition Information in Crisis Situations (NICS)* nutritional status data in emergency situations using internationally agreed upon standards for data collection.[i]

Macro and Micro-Nutrient Deficiencies in Refugee Camps

In 1997, WFP and UNHCR adopted a target level of 2100 kcal/person/day for allotment in refugee settings. Jason B. Mason's *Lancet* editorial in 1992 gained significant attention from the UN by explaining four historic misperceptions about refugee feeding programs: *1*) "starving people can eat anything"; *2*) "refugees can manage with less"; *3*) "trading foods indicates that people do not need all of the rations"; and *4*) "energy adequacy means nutritional adequacy."[44] While the first three points resulted from data and informed feeding program implementations since this publication, micronutrient deficiencies, related to the fourth point, more slowly gained recognition. In the 1980s, micronutrient deficiencies were regarded as the unintended consequences of emergency feeding programs. Mason's article demonstrated that calculating the micronutrient supply in rations predicted micronutrient deficiencies that would occur over time in situations with rations of only three to four commodities. A diet containing adequate energy, but lacking micronutrients, inevitably leads to micronutrient deficiencies:

> "Micronutrient deficiencies is often called "silent malnutrition", as it is not visible at all for some of the micronutrient deficiencies (type II deficiency)

> or until the deficiency is very severe with clinical signs and symptoms (type I deficiency),such as anemia, scurvy or iodine deficiency."[44]

The four most prevalent micronutrient deficiencies in emergency settings are iodine, iron, vitamin A and zinc.[45] Vitamin A supplementation is associated with decreased mortality rates in less-developed countries and emergency situations.[45] Iodine deficiencies during prenatal and early development cause mental retardation associated with long-term economic and quality of life consequences that could be avoided. [46]

Based on Nutritional Strategy Papers drafted by Country Offices of UNHCR/WFP in Ethiopia and Kenya, UNHCR and WFP published a joint review, "Malnutrition in Protracted Refugee Situations: A Global Strategy" in January 2006.[7] Key issues relative to the nutritional status of refugees identified in this report include:

1. High rates of acute malnutrition in many camps, notably in Kenya, Ethiopia, Sudan, and some camps in Sierra Leone and Chad
2. Anemia levels above the WHO criteria identifying a severe public health issue[3,47]
    a. Need iron/folate provisions and increased iron and vitamin C in diet
3. Need of UNHCR and WFP to increase nutritional technical support and expertise for Country/Regional programs. In many cases, the Joint Assessment Mission lacked a nutrition expert and there was poor follow-up action to nutrition-related recommendations from the nutritional assessment surveys.
4. Lack of a comprehensive nutritional surveillance program or growth monitoring in camps.

[3] Severe= > or = 40% prevalence; Moderate=20.0-39.9%; Mild= 5.0-19.9%; Normal=<=4.9

5. Poor training and lack of guidelines and appropriate weaning foods for adequate infant feeding practices.
6. Nutritional services, including selective feeding programs, infant feeding, community health worker outreach and nutritional education were not following standardized guidelines nor have sufficient coverage to support the refugee needs. There was often a low level of confidence in the health services, due to insufficient or inequitable care. This was often due to lack of capacity of the implementing partner or lack of UNHCR technical assistance.
7. Water quality and quantity in camps was below SPHERE Project minimum standards leading to diarrheal diseases, lack of water for cooking, hygiene and hydration−all leading to nutritional deficiencies.
8. Lack of nutritional support for HIV/AIDS and malaria. HIV and tuberculosis interact with nutritional attainment by reducing appetite and the body's ability to absorb nutrients. The malaria burden elevated anemia problems.
9. Fortified blended foods must become standard, particularly in camps in dry or harsh environments.
10. Low caloric intake resulted from low acceptability of rations and selling portion of rations for other non-food items.
11. Incomplete food basket, inconsistent pipeline and late delivery of food contribute to malnutrition.
12. WFP/UNHCR needed to monitor food distributions.
13. Lack of opportunities for self-reliance, income. Need for micro-agricultural initiatives with provision of adequate seeds and tools and land.
14. Girls and women suffered disproportionately in their daily lives.[7]

Long-Term Consequences of Childhood Malnutrition

Macro- and micro-nutrient deficiencies during prenatal and early childhood development pose significant short-term and chronic health consequences.[18-21] Prenatal and childhood malnutrition are associated with increased mortality, infectious disease, delayed psychomotor development, poor academic performance, and lower productivity levels later in life. Epidemiologic studies show that malnourished infants exhibit neuro-integrative disorders years after nutritional recovery. Rapid brain growth occurs from the third trimester of pregnancy to 24 months after birth, the time over which inadequate nutrition has the most profound impact on brain development.

The Barker Hypothesis

The "Barker Hypothesis," also called the Fetal Origins of Adult Disease (FOAD), conceptualized that low birth weight is associated with a variety of chronic diseases in adulthood, including coronary heart disease, type II diabetes mellitus (TIIDM), obesity, cancer, osteoporosis, and several psychiatric illnesses. Reacting to maternal malnourishment, a fetus alters "the structure and function to preserve neurodevelopment and promote survival."[18] Physiological adaptations from periods of hunger during infancy and early childhood may increase the risk of obesity. During periods of malnutrition, the developing bodies of children work towards energy conservation and maintaining a slow metabolism.[18,48] While recovering from under- nutrition, the body replenishes a higher proportion of fat stores than protein stores. Therefore, even without overconsumption of calories, the body may store fat and gain excess wait. These conditions require monitoring and dietary regimens to reduce risks of morbidity and mortality.[19] Experimental studies support that prenatal and postnatal nutritional deficiencies program the developing metabolic system effecting blood lipids, blood pressure, behavior and learning, and increasing risks of diabetes, obesity, glomerular hypertrophy, and atherosclerosis.[19]

Malnourishment and Obesity

The study of the WWII Dutch famine pioneered the concept that obesity is associated with gestational food deprivation.[48] Researchers at the Federal University of São Paulo studied the relationship between childhood under-nutrition and obesity in low income populations. In Sao Paulo, Sawaya and Roberts found a prevalence of 30% under-nutrition among children less than 5 years of age (weight-for-age less than -2 z-score and/or height-for-age less than -2 z-score), concurrently with a 21% and 15% obesity rate (weight-for-height above 85th percentile of body-mass-index [BMI] for age) among adolescent girls and adults, respectively.[48] Similarly, in the low income city of Alogonas, Brazil, Florencio, et al. found high levels of stunting and obesity coexist. The prevalence of stunting among children under 10 years of age was 8.3% and stunting and under-weight combined was 8.7%, while 25% and 22% of adults were categorized as obese and stunted, respectively.[48]

A recent study among low income adults in Brazil found that 17% of adults had a BMI greater than 25 yet were only eating 80% of their daily caloric requirements based on stature.[48] As obesity and adiposity are associated with several chronic health conditions such as diabetes, cardiovascular disease, high blood pressure and stroke, the nutritional and anthropometric status of children among previously undernourished refugees in the US should be assessed to provide preventive treatment for the chronic disease risks they face.

Micronutrient Deficiencies

Two specific micronutrient deficiencies identified among refugee children merit early assessment and intervention to prevent associated chronic health consequences: iron deficiency and vitamin A. Iron deficiency and iron deficiency anemia, common issues among refugees, are associated with delayed cognitive development in infants, early and pre-term birth for deficient mothers and impaired productivity and memory function among adults. Iron deficiency occurs

mainly from low iron intake or low absorption of iron from diets high in phytate or phenolic compounds; risks increase during pregnancy and early childhood when the body requires more iron. Anemia results from a variety of causes which may work independently but often coexist.[49] The most common cause of anemia, responsible for approximately 50% of cases worldwide, is iron deficiency. Causes of iron-deficient anemia, which may be present in refugee camp settings, include parasitic infections like hookworms, malaria, ascaris and schistosomiasis, all of which potentially lower hemoglobin (HB) levels.

Iron deficiency has detrimental effects on cognitive performance, mental development, behavior and growth of infants and children. Children with anemia under one year of age have delayed psychomotor development and a five to ten point deficit in IQ. Anemia weakens the immune system making refugees more susceptible to communicable diseases and other infections. Lastly, iron deficiency affects the gastrointestinal function and weakens muscles reducing the productivity of all age groups. Iron deficiency has also been linked to a reduction in human capital formation and supplementation has seen the long-term gains of 2,679 daily-adjusted life years (DALYs) at US $37 per day in developing countries.[47] Anemia during pregnancy increases the risk of maternal and infant mortality. Iron deficiency also makes children more susceptible to heavy-metal absorption resulting in higher rates of lead poisoning.[47] Finally, other micronutrient deficiencies, including vitamins A and B12, folate, riboflavin and copper increase the risk of anemia.[50]

It is estimated that globally between 250,000−500,000 children lose their vision each year from vitamin A deficiencies. Vitamin A deficiencies cause blindness and severe visual impairment. Deficiencies also increase the risk of maternal and infant mortalities, and increase child vulnerability to and mortality from infectious diseases such as diarrheal disease, measles and

pneumonia. Vitamin A distribution has been integrated in many camp settings targeting children and pregnant women.

Micronutrient Deficiencies Overseas

Seal, et al. conducted a cross-sectional study in 2005 of five refugee camps in north and east Africa with populations dependent on long-term international food aid. The research found concerning rates of iron deficient anemia and vitamin A deficiencies. The WHO classifies the prevalence of 40% anemia or 20% vitamin A deficiency as a substantial public health problem.[51] In the five camps surveyed for iron deficient anemia, prevalence ranged from 12.8% (95% confidence interval [CI], 7.0, 18.6) to 72.9% (95% CI, 66.1-79.7) among children 6-59 months of age. In the four camps assessed for vitamin A deficiency, the prevalence rate for retinol deficiencies among children aged 6-59 months ranged from 20.5% (95% CI,12.1, 29.0) to 61.7% (95% CI 50.2-72.1).[52] Vitamin A capsule distribution coverage according to recall questionnaires ranged from 3.5% to 66.2%.

In a systematic review of the prevalence and prevention of micronutrient deficiencies in refugee settings worldwide, Timothy D. Dye in a 2002 survey of Bhutanese refugees in Nepal found 85.8% of children were riboflavin deficient.[53] In another study among Rwandan refugees in Tanzania over the age of 50 years, the authors found 19.5% malnutrition prevalence among men and 13.1% among women.[54]

Domestic Micronutrient Deficiencies

Anemia was present in 12% of 1,247 refugee children resettled in Massachusetts, with a rate of 29% among children under two years of age.[55] In Maine, 20% of refugee children were anemic at the time of their new-arrival medical evaluation.[56] The pre- and post-resettlement exams provide unique opportunities to detect malnutrition and micro-nutrient deficiencies in refugees.

Pre- and Post-Resettlement Health Screenings

In the case that third country resettlement presents the only viable option for refugees, UNHCR collaborates with host countries; each year the US resettles approximately 73,000 (FY2010 – DOS proposed Admission 2011), 75% of all referrals by UNHCR.[57] Three to six months prior to resettlement, refugees undergo an overseas medical exam. After arrival in the US, refugees the vast majority of refugees receive new arrival screenings administered in their State of resettlement.

Overseas Medical Examination

IOM conducts 70% of the overseas pre-departure health screenings who follow the CDC's technical instructions.[58] The technical guidelines for the overseas panel physician examination focus on preventing the spread of communicable diseases and protecting American citizens. The purpose of the exam is to determine whether an applicant has a Class A condition; the presence of disorders that result in exclusion from the US under the Immigration and Nationality Act. Class A conditions are mental or physical disorders (including diseases of public health concern or drug abuse or addiction) making them ineligible for a visa. The communicable diseases deemed of public health significance include: tuberculosis, syphilis, cancroids, gonorrhea, granuloma inguinale, lymphogranuloma venerum and Hansen's disease. Class B conditions constitute symptoms that, while not warranting exclusion, present interferences with a person's ability to care for himself or herself, attend work or school and may require extensive treatment in the future. These include latent tuberculosis infections and chronic non-communicable diseases, such as diabetes and hypertension. Panel physicians are only responsible for determining Class A and Class B status, if the physician is unable to determine this due to an acute illness, the alien should seek treatment and complete the medical examination after recovering. For additional details on the overseas medical examinations, see Appendix I.

Domestic Medical Screenings

The Federal Refugee Act of 1980 determines that the Secretary of ORR shall ensure the appropriation of staff to US ports of entry to ascertain overseas medical screening records (Department of State forms) in proper order, to identify those with medical conditions of public health concern and to transfer medical records and any notifiable disease information to the receiving State or local health department. Today, the electronic disease notification system (EDN) transfers the collected forms through an online database. Under section 412 (b) (5) of the Refugee Act, State and local health agencies provide a medical screening within the first 90 days of arrival and the Director is authorized to reimburse agencies conducting these screenings. State and local refugee health coordinators report to ORR tri-annually for continued funding through the Cash Medical Assistance (CMA) program.

The CDC with the ORR developed guidelines for State and local public health departments to perform post-arrival medical screening of refugees. The guidelines are recommendations and not mandates. The November 21, 1995, ORR letter #95-37 provided a *Medical Screening Protocol for Newly Arriving Refugees* for use of ORR funds, specifically the Refugee Medical Assistance (RMA) program. The CDC Division of Global Migration and Quarantine (DGMQ) website provides more detailed guidelines with updates. There are 11 sets of guidelines: General Guidelines, History and Physical, HIV Infection Screening guidelines, Immunization, Intestinal Parasite, Lead Screening, Mental Health Screening, Malaria guidelines, Nutrition and Growth, Sexually Transmitted Diseases and Tuberculosis.

Presumptive treatment therapies administered prior to departure are included with the pre-departure medical screening forms and placed in IOM or blue and white bags carried by refugees in transit. Records are available to State refugee health coordinators through EDN. For additional

information on the CDC recommended guidelines for domestic medical screenings, see Appendix II.

Nutrition Guidelines

In October 24, 2011, CDC published guidelines for the evaluation of nutrition and growth status of refugee children.[59] The suggested evaluation includes a dietary history including habits, restrictions and dietary norms, allergies and any known current or past nutritional deficiencies. The CDC recommends anthropometric measurements to initiate growth monitoring, assess for wasting (weight for height), stunting (height for age), and underweight (weight for age). For children under two years of age, the WHO standard references should be used and for older children National Center for Health Statistics of the Centers (NCHS) standards are appropriate.

The nutritional examination should include the complete blood count with differential, including red blood cell indices. Common micronutrient deficiencies are outlined including iron deficiency, particularly among infants 6-24 months of age. Dark-skinned persons resettling in temperate areas are at increased risk of vitamin D deficiency. The guidelines also describe risks of vitamins A, C, and B12, zinc, niacin, iodine, and thiamine deficiencies. The guidelines call for population-specific testing as nutritional issues are identified within a particular population, like the vitamin B12 deficiency among Bhutanese refugees.[60] The third section of the guidelines prescribes prevention and counseling. Children aged 6-59 months should be given multivitamins while older children and adults should consider specific supplementations. Pediatricians should monitor the health and nutrition of children and provide ongoing counseling and culturally appropriate nutrition education.[59]

CHAPTER III Nutrition Related Health Outcomes among Refugees in the US: Literature Review

The United Nations Economic and Social Council's *The right to adequate food (Art. 11):.05/12/1999 E/C.12/1999/5.)*states that "the core content of the right to adequate food implies: The availability of food in a quantity and quality sufficient to satisfy the dietary needs of an individual, free from adverse substances, and acceptable within a given culture." Nationally, the Department of State commits the US to protect the well-being of refugees through the entire process of resettlement.[57] Therefore, the US assumes responsibility for ensuring proper nutrition and follow up for potential nutritional deficiencies among refugees.

Refugees face increased risks for acute and chronic diseases due to their pre-resettlement environments and challenges to accessing healthcare service once resettled in the U.S. Similarly, refugees are susceptible to nutrition-related diseases due to histories of malnutrition and food scarcity and post-resettlement challenges to acquiring proper nutrition. Barriers to adequate nutritional attainment in the US for refugees include: acculturation obstacles, economic limitations, language barriers, adjustment from food deprivation to excessive food choices, "fast food", unfamiliarity with cooking procedures and instruments in the US, lack of nutritional knowledge and living in "food deserts." "Food deserts," characteristic of urban neighborhoods with high rates of foreign-born inhabitants, are described as areas of limited access to healthy and affordable food.[61]

In studies among immigrants, rates of diseases that are linked to poor nutrition such as diabetes, heart disease, high blood pressure and obesity, are positively associated with length of time in the US.[62,63] According to Peterman, et al. "Refugees in the US have higher rates of some

chronic diseases than US-born residents or other first-generation immigrants."[64] Hypertension, TIIDM, and heart disease were found to be emerging problems in two local refugee populations in the US.[20,62] Therefore, further research is needed to determine how pre- and post-resettlement factors impact the nutrition and health of refugees in the US to determine the full relational model of refugee nutrition. Existing literature examines components of this wider picture. The peer-reviewed literature covered in this section explains some of the barriers to nutritional attainment for refugees in the US, perspectives of refugees and service providers, and the prevalence of nutrition-related outcomes among refugee populations in the US.

Acculturation

The acculturation theory, defined as, "those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact with subsequent changes in the original culture patterns of either or both groups"[65] describes another major barrier for refugee health and nutrition care. Adjusting to new food choices and cultural behaviors without sacrificing sometimes contradictory traditions and beliefs makes health behavior adoption difficult. Refugees have distinct characteristics that impact their reaction to American food culture and practices, including mental health conditions and history of trauma, history of starvation, low education and literacy, and different ways of coping with being forced to leave their home and traditional culture.[64]

Peterman, et al. conducted two focus groups and a survey among Cambodian women in Lowell, Massachusetts examining the relationship between refugees' personal characteristics and dietary practices.[20] Using the 10-question Psychological Acculturation Scale developed by Tropp and colleagues and 24-hour food diaries, Peterman identified that higher degrees of acculturation were associated with increased intake of whole grains and brown rice and decreased intake of

high sodium Asian sauces. Focus groups showed that children and adolescents preferred American food, while parents preferred traditional dishes. The research indicated that refugees frequently prepared food like hotdogs and chicken nuggets for children. Similarly, 44% of refugee families with children eat fast food at least two times per month compared with 13% without children. Other studies also indicate similar trends among refugee and adolescent children eating high proportions of fast food.[66]

In his 2004 study, Craig Hadley examined the food insecurity and child hunger among Liberian refugees recently resettled in Rhode Island.[67] Criteria for the study sample included Liberian mothers living in the US for less than 5 years who had children under the age of 5 years. Hadley found that Liberian refugees preferred in-home family-style meals. Barriers to food security included concerns of "chemicals" in US consumables, difficulties discerning between items in large supermarkets and anxieties about finishing food stamps before the end of the cycle. Refugees with food insecurity and hungry children in their household reported frequently having dinner at friends' homes indicating a cultural and communal reaction to food shortages.

Quickly accessible fast food restaurants and supermarkets with expansive varieties of products introduce another component for acculturation. The necessity to choose between foods and brands and the abundance of food can overwhelm many resettling refugees.[68]

In 2010, Rondenelli and colleagues conducted a qualitative study of under- and over-nutrition among refugees in San Diego County.[62] The research team conducted in-depth interviews with refugees, representatives from voluntary resettlement agencies, personnel of mutual assistance agencies, and health care providers with a large refugee clientele base. "Unhealthy weight gain" emerged as the most common theme among African refugees. One health care provider said:

> *"Many of them are starved…in their past…so when they do have food, they will eat until they literally explode. Not literally, figuratively."*

Similarly, an African refugee respondent stated that:

> *"When you are a refugee…you eat whatever you find, so that's what is causing bad eating…they don't watch healthy food."*

Culture-specific barriers also warrant consideration when determining nutrition status. For instance, Willis, et al. found that adult Sudanese Dinka and Neur refugees in Nebraska struggled with eating American foods since many extracted their six lower front teeth during childhood in accordance with tribal traditions. Secondly, men traditionally did not prepare food and it was found that unmarried Dinka and Neur men ate mainly from vending machines and restaurants.[66]

Economic Barriers and Governmental Assistance

State and Federal programs assist refugees in attaining health insurance. Temporary Assistance for Needy Families (TANF) and Medicaid is offered for refugee families with minors. Non-qualified refugees are eligible for Refugee Cash Assistance (RCA) and all refugees receive the RMA for their first eight months in the US. Under an RMA, the refugee receives the same benefits package as Medicaid recipients in the same State. After the eight months of coverage, the refugee is eligible for the same medical insurance assistance as other low-income people in the state, if eligible.[69] To overcome language barriers to healthcare access, Title VI of the 1964 Civil Rights Act requires all healthcare providers receiving federal financial aid offer oral and written language assistance to foreign language speakers. Additionally, some States include laws requiring medical interpreters in emergency rooms.[70]

Refugees may participate in the Supplemental Nutrition Assistance Program (SNAP), formerly the Food Stamp Program, without a waiting period. The SNAP program is authorized by the Food and Nutrition Act of 2008, which provides federal guidelines for State-run programs. Bolinger et al. modeled the use of food stamps among refugees finding higher food stamp usage in times and areas of unemployment and a decline in usage after time spent in the US, suggesting that refugees use SNAP benefits as a social safety net while prioritizing economic self-sufficiency.[71]

Additionally, the Women, Infants and Children (WIC) program provides checks or vouchers for specific foods to add essential nutrients in the diet each month to pregnant, breastfeeding and postpartum women and children under 5 years of age. Although WIC encourages breastfeeding, it also provides a nutritional formula when breastfeeding is not an option. WIC agencies are locally based.

However, SNAP and WIC only address the financial aspect of socio-economic barriers to appropriate nutritional attainment. Commonly, refugees also lack physical access to healthy food options. Approximately 95% of refugees resettle in cities in areas with large foreign-born populations. Refugees of similar origin establish hubs in specific metropolitan areas due to family and community re-unification and the tendency of voluntary resettlement agencies to gain expertise and rapport in working with specific groups.[72] Recognizing that this is a problem among refugees, ORR established a partnership with USDA called the Refugee Agricultural Partnership Program (RAPP). The program provides annually grants to 10 community organizations for refugees training and resources to start and maintain small urban and rural farms to provide healthy options for the community and an opportunity for economic exchange.[73]

In Hadley's surveys, 90% of those enrolled in the Food Stamp Program reported finishing their distribution of food stamps one to two weeks before they were eligible to receive more. The study found a 42% prevalence rate of child hunger, defined as a positive response to at least one of the following statements: "*My child(ren) is/are not eating enough because I just cannot afford enough food*," or "*I know my child(ren) is/are hungry sometimes, but I just cannot afford more food.*"

Food insecurity defined as: "whenever the availability of nutritionally adequate and safe foods or the ability to acquire them is limited or uncertain" using the Radimer/Cornell instrument presented among 85% of families. Socio-economic factors associated with child hunger and food insecurity included living in the US for less than one year (p 0.039), level of maternal education (73% hunger among non-educated vs. 17% among high school or higher educated women), unemployment (86% unemployed parents had child with hunger in the household vs. 14% of employed) and income.[67]

Analyses of US-Refugee Nutrition indicators and Related Chronic Health Conditions

Clarkin examined the adiposity and height of adult Hmong refugees considering several variables: birth in "safe zone"' vs. "war zone," whether displaced before the age of two years, total number of times displaced, number of siblings, whether any parents or siblings had died.[74] Additionally, Hmong refugees were sampled from the US and from French Guiana. In the latter, refugees lived as full-time farmers and ate locally produced foods. Being born in a war zone and experiencing a sibling's death was both significantly associated with decreased height in females. Linear regression analysis indicated that being displaced as an infant was significantly

associated with shorter adult height in both sexes. Hmong born in war zones had higher body fat percentages (adiposity).[74]

In 1995, with the increasing diversity of origins among incoming refugees, Massachusetts Department of Public Health consolidated the refugee medical screenings in the Massachusetts Refugee Health Assessment Program (RHAP), in partnership between the Department of Public Health and contracted private, mostly federally qualified clinics. RHAP's records, used for the two preceding studies, demonstrate the benefits and capabilities that emerge from systemically maintained refugee health screenings of several indicators.

Geltman, et al. analyzed RHAP data on the 1,825 refugee children under the age of 18 years who entered and were screened in Massachusetts from 1995-1998. They found that 21% of children had parasites, 62% had dental caries, and 25% had positive tuberculosis skin test reactions. The prevalence of weight-for-height z-scores less than -2 was 8% among Africans and East Asians children. The height-for-age z-scores less than -2 were present in 13% of African, 19% of Near Eastern, and 30% of East Asian children.

In a May 2009 publication, Dookerman et al. analyzed health screening data for 4,239 adult refugees and asylees who arrived in Massachusetts between January 1, 2001 and December 31, 2005.[75] Researchers determined the prevalence of obesity/overweight, hypertension, coronary artery disease (CAD), diabetes, and anemia. Almost half of the sample was overweight and 22.6% had hypertension. CAD, diabetes and anemia prevalence rates were low. However, the results differed greatly by region of origin (determined by multivariate logistic regression) with overweight/obesity and hypertension more common among those from Central and Eastern Europe. Of concern, anemia prevalence was about 20% among African refugees. Two important

implications for the study and for care of refugee populations resettled in the U.S. are: 1) the pre-resettlement environment (in the case of the Dookerman et al. study, the region of origin) is associated with health outcomes, and 2) the use of retrospective data from medical screening and follow up are data worth reviewing and using to improve the health status of refugees post-resettlement. This raises the hypothesis posed in this present report: that nutrition status among refugees in camps are associated with health and nutrition outcomes after their resettlement.

Relating Camp and Post-Resettlement Nutrition

One recent example in which camp conditions proved to have nutritional effects among refugee post-resettlement occurred among Bhutanese refugees in Minnesota, Utah and Texas when they were found to have high rates of vitamin B12 deficiency.[76] Persistent monitoring of camp-level nutrition data should inform US protocol among specific groups, such as testing for B12 levels among Bhutanese refugees given the high levels of vitamin B12 deficiency in camps pre-departure. Recently, the CDC utilized overseas nutritional data to assess causation and propose a solution to the B12 deficiency issue among Bhutanese refugees by studying the sera collected in the overseas medical evaluation, results collected during domestic medical exams in three states and interviews with clinicians working with the Bhutanese populations in Minnesota.[60] This demonstrates the utility of overseas nutritional data and trends in planning domestic care that meets the needs of refugee children.

Similarly, in 2008 CDC began receiving reports from State health departments of elevated blood lead levels among Burmese refugee children. Correspondingly, there were higher rates of anemia in this population. The CDC conducted an epidemiological study in the refugee camps and found exposure to motor vehicle batteries, taking traditional remedies containing lead, and

mouthing cosmetic items in camps that may contribute to the elevated blood lead levels post-resettlement.[60]

Chapter IV Methodology

Introduction

This research is novel in its attempt to look cross-sectionally at both refugee nutrition in protracted camp settings and at nutrition outcomes and services of populations from these source: populations who resettle in the US.

A database or complete medical records for refugees from camps to post-resettlement do not exist. Therefore, this research was split into two objectives in order to formulate future hypotheses on the relationship between nutrition in camps and post-resettlement nutrition and to identify the gaps and appropriate standards for nutrition assessment upon resettlement and services offered in the States.

Overseas Nutrition

The first aim was to provide a descriptive nutrition analysis of refugee children less than 59 months of age in camps from which refugees are resettled into the US.

Population

The target population was children under 59 months while living in one of the surveyed refugee camps between 2004 and 2010. All met the UN definition of refugee. Each camp was predominantly, if not exclusively, populated by refugees from a single country of origin. In order to determine the countries of origin relevant for the overall aim of this study, the Department of Health and Human Service ORR's Annual Resettlement[77] data from 2004-2009 were compiled and sorted by country of origin (based on available data at the time). While refugees originated from 99 different reported countries, 20 countries comprised 98% of all refugees. Of these top 20 countries of origin, 12 had situations in which those fleeing the country would fit the UN definition of refugees and would live in secondary country refugee camps prior to US entry: Burma, Somalia, Bhutan, Liberia, Burundi, Sudan, Ethiopia, Eritrea, the Democratic

Republic of Congo (DRC), Sierra Leone, Republic of the Congo and Rwanda. Of these, refugees from Burma, Somalia, Bhutan, Liberia, Burundi, Sudan, Eritrea, and the DRC were included in the sample. Refugees from Rwanda, the Congo and Ethiopia were excluded due to lack of available survey data. The refugees originating from the eight selected countries make up 127,460 (45.8%) of all refugees entering the US from 2005-2009.

Table 3 Sample Population: Countries of Origin and Arrival Statistics from 2005-2009

Country of Origin	# Arrivals 2005-2009	% of Total *
Burma	43673	15.7%
Somalia	34074	12.3%
Bhutan	18564	6.7%
Liberia	9495	3.4%
Burundi	8840	3.2%
Sudan	5785	2.1%
Eritrea	3528	1.3%
Democratic Republic of Congo	3501	1.3%
TOTAL	**127460**	**45.8%**

Total US arrivals from 2005-2009= 278,020 Source: http://www.acf.hhs.gov/programs/orr/data/refugee_arrival_data.htm

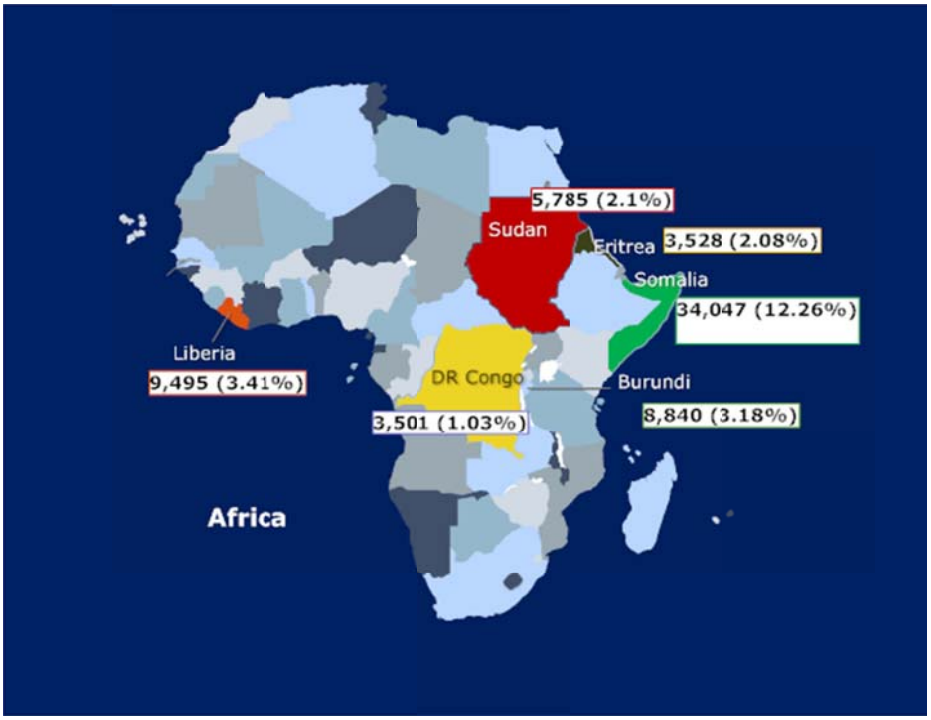


Figure 2 Countries of Origin of Selected Sample Refugees from Africa, n (%) of US Arrivals, 2005-2009

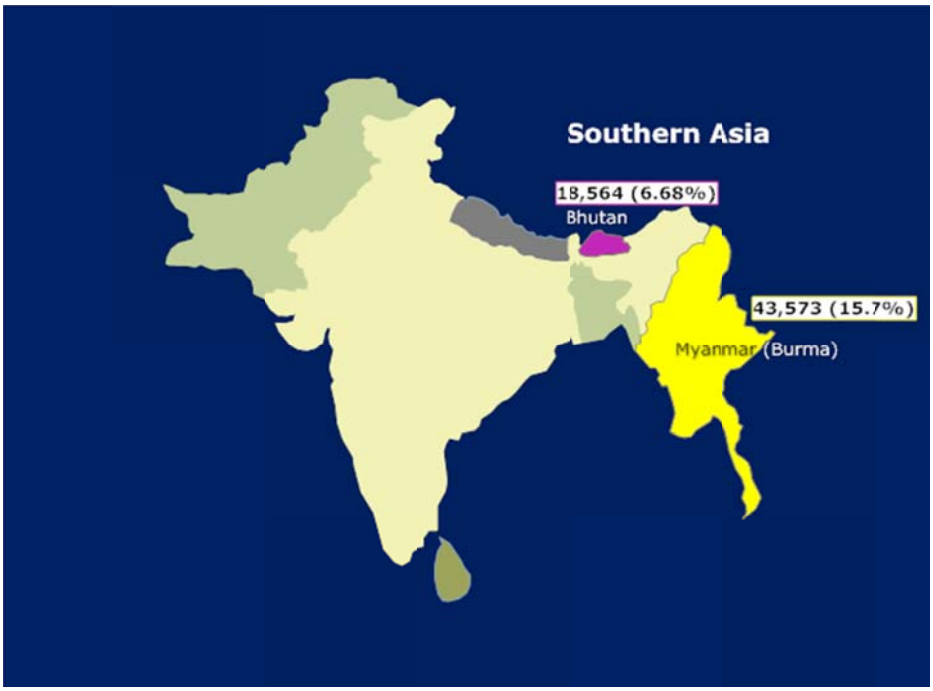


Figure 3 Countries of Origin of Selected Sample Refugees from South Asia, n(%) of US Arrivals, 2005-2009

Data Source

Child nutrition status in refugee camps was examined by compiling and analyzing of data published on the United Nations System Standing Committee on Nutrition's Nutrition Information in Crisis Situations (NICS) database. The data are publicly available at: http://www.unscn.org/en/publications/nics/database.php.

The NICS database compiles nutrition and mortality results from surveys which meet internationally agreed standards, which include:

- Cluster sampling using a proportional to population size (PPS) method with at least 25 clusters
- Systematic or simple random sampling
- Exhaustive surveys

Surveys included in the database must include 95% confidence intervals. Additional survey data for 2010-2011 published by the PRM were included to supplement these recent years. Surveys were listed by camp name and location. Camps with available data were matched for refugee origin nationality to each of the selected eight countries of origin. Surveys between 2004 and 2011 in these camps were included in the analysis. For each camp, all surveys were compiled: 2-7 years of annual surveys. A total of 52 surveys contributed to the descriptive analysis. Each is represented as a data point on the Global Acute Malnutrition charts.

Measurements:

1. **Global Acute Malnutrition**

GAM is the population prevalence of wasting (weight for height < -2 z-scores of NCHS reference standards) and/or edema. Since the release of the WHO growth standards in 2006, results calculated using the WHO Growth Standards are reported, when available.[5]

The WHO classifies GAM prevalence in its assessment of crisis situations as[78]:

- "Acceptable"= prevalence <5%
- "Poor"= prevalence 5-9%
- "Serious"= prevalence 10-14%
- "Critical"= prevalence > or = 15%

2. Anemia

Anemia is assessed by measuring hemoglobin concentration in the blood. Among children 6-59 months the three classifications of anemia are:

- "Mild" <11g/dl
- "Moderate" <9.5 g/dl
- "Severe" <8g/dl

Some of the surveys used in the study give prevalence estimates for each classification of anemia while others only give the global prevalence (combined mild, moderate and severe prevalence). On the population level, the WHO rates the public health implications of anemia prevalence in four categories:

- "No public health problem"= prevalence < or = 4.9%
- "Mild public health problem"= prevalence 5.0-19.99%
- "Moderate public health problem"= prevalence 20.0-39.99%
    - "Severe public health problem "= prevalence > or = 40.0%

3. **Vitamin A distribution**

   Data on the prevalence of vitamin A distribution to children 6-59 months of age were provided in a limited number of surveys.

US Nutrition assessments and services

A second objective was to determine current nutrition assessment procedures in state resettlement medical screenings and related services. The second objective was intended to inform best-practice standards to address issues if poor refugee nutrition was found among those in the camps before potential resettlement.

The literature review, included in the previous chapter, describes findings on nutrition indicators and related health outcomes among refugees in the US. To examine the nutrition components of the domestic medical exam, the exam's coverage rates and the utilization of medical examination data, a survey was designed and conducted among State Refugee Health Coordinators. Personal communication about data from the DeKalb Board of Health Refugee Health Screening clinic in Decatur, Georgia, provided malnutrition and anemia rates among a small convenient sample of US-resettled children.

Population

a. Refugee Health Coordinators (RHCs)-

   RHCs are defined as the State or local health person responsible for overseeing the administration of medical health exams for refugees within his or her jurisdiction. Sixteen RHCs from the 15 states receiving 76% refugees from 2004-2009 were given standardized surveys on January 20, 2012. These 15 states were: California, Texas, Florida, Minnesota, New York (and New York City exclusively), Arizona, Washington,

Georgia, Michigan, Illinois, North Carolina, Ohio, Pennsylvania, Virginia, and Massachusetts.

Additionally, local key informants participated in informational interviews and site visits to add substance and case perspectives. The Pediatric Refugee Clinic at DeKalb County Board of Health provided insight into patient trends and services. Dr. Alawode Oladele, clinical director of the DeKalb Board of Health provided information on referral patterns and Drs. Oladele and Susan Reines, of the Pediatric Refugee Health Clinic, hosted the author for clinical observations.

Measurement

The RHC survey included 18 questions covering the use of anthropometric measurements among children under 5 years, older children and all refugees; the use of growth standards; and assessment of wasting, stunting and underweight. The end of the survey asked about follow-up services and referrals provided, including WIC, nutrition counseling, visit to regular pediatrician, and distribution of supplements. Open-ended comments were encouraged in each question. An additional open-ended question asked about overall nutrition-related trends observed by health coordinators. Permission for additional telephone follow-up was sought in the closing of the survey. Distribution of this survey was supported by an introductory letter to RHCs from the RHC chair, Dr. Dipti Shah.

Chapter V Manuscript and Results

A Human Rights Violation: Malnourished Refugee Children in Camps and After US Resettlement

Abstract:

Background: Identifying and addressing nutrition issues among US-resettling refugee children are a human rights issue. **Methods:** The target population is children from Burma, Bhutan, Somalia, Liberia, Eritrea, Sudan, Burundi, and the Democratic Republic of Congo 6-59 months of age who live in secondary country camps prior to US-resettlement. Analysis of camp child nutrition data informs pre-arrival nutrition conditions. A survey of Refugee Health Coordinators provides information on nutritional assessment, reporting and referrals in domestic refugee medical screening. **Results:** Half of the camps had global acute malnutrition prevalence rates over 15% at least once from 2004-2010. Camps collecting anemia data had greater than 40% prevalence. The majority of State-regulated refugee health exams include height and weight measurements but few use National Center for Health Statistics or WHO standards. **Recommendations**: Improve overseas monitoring and data linkages of nutrition information to US-resettlement services. Domestically, adopt standards for nutrition assessment and referral protocols.

A Human Rights Violation: Malnourished Refugee Children in Camps and After US Resettlement

Caitlyn Lutfy,[1] Susan T. Cookson,[1,2] Leisel Talley,[1,2] Roger Rochat[1]

[1] Emory University, Rollins School of Public Health, Hubert Department of Global Health; Atlanta, GA [2] Centers for Disease Control and Prevention, Center for Global Health, International Emergency and Refugee Health; Atlanta, GA

A Human Rights Violation: Malnourished Refugee Children

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Corresponding Author:

Caitlyn Lutfy
7 Edgewood Drive
Milford, MA 01757
(508)-932-0715
Caitlyn.Lutfy@Emory.edu

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Background

The Office of the United Nations High Commissioner for Refugees (UNHCR) recognizes malnutrition not only as a physiological condition, but a human rights and resource issue [79]. In a June 2007 Inter-Agency Standing Committee meeting on nutrition, UNHCR expressed concern over high rates of childhood malnutrition in the protracted refugee situations [14].

Children under 5 years of age experiencing macro- and micro nutrient deficiencies face increased risk of adverse developmental and chronic health conditions [48]. Malnutrition prevalence in refugee camps and the limited studies of US-resettled refugee children suggest that malnutrition may persist. This study aims to capture nutrition assessments of refugees living in camps where US-refugees originate and US nutrition-related assessments and referrals for arriving refugees during domestic medical screenings.

Methods

The target population is US-resettled refugees who previously lived in secondary country camps while 6−59 months of age. From the Office of Refugee Resettlement (ORR) New Arrival Data from 2005-2009 [80] (years of available data at the time), US-resettling refugees originated from 99 different countries; 20 countries comprised 98% of all refugee arrivals. Eight of these had adjacent countries where refugees fled and lived in camps with available camp-level nutritional data. The target population comes from: Burma, Somalia, Bhutan, Liberia, Burundi, Sudan, Eritrea, and the Democratic Republic of Congo.

The publicly available UN Nutrition Information in Crisis Situations (NICS) database was used to examine nutrition status of children living in refugee camps. From 2004-2010, all 66 surveys in 22 secondary country camps housing refugees from the eight selected originating countries

were compiled. Global Acute Malnutrition (GAM) and anemia prevalence rates, and vitamin A distribution for children aged less than 5 years were compiled for descriptive analysis. GAM is defined as the prevalence of 2 z-scores below the WHO mean standards for weight-for-height measurements or presence of edema. Anemia is defined as hemoglobin levels less than 11g/dL. Rates were assessed using WHO crisis malnutrition charts.[78]

A standardized survey was administered to a sample of State and metropolitan Refugee Health Coordinators (RHCs) to determine domestic nutritional assessments, reporting and referral services.

Results

The eight selected countries of origin represented 127,460 (45.8%) of all US-arriving refugees from 2005-2009.

Surveyed camps were located in Bangladesh, Nepal, Kenya, Ghana, Tanzania, Kenya, and eastern Sudan. Of the 22 camps from 2004−2010, 95% (including all eight countries of origin) had at least one survey with GAM prevalence greater than 5%. In 45% of camps (Burmese, Somali, Bhutanese, Liberian, Sudanese, and Eritrean children) GAM was 10%−14% in at least one survey period from 2004-2010. Half of the camps (Burmese, Somali, Sudanese, and Eritrean children) had at least one survey with a GAM greater than 15%. Childhood anemia prevalence was reported after 2008, with 12 surveys from 10 camps. All 10 camps (housing Burmese, Bhutanese, Sudanese and Eritrean children) had anemia prevalence of 40% or greater in at least one survey. Vitamin A distribution to children aged less than 5 years was reported in eight camps surveys from 2004-2010 (housing Burmese, Bhutanese, Somali, Liberian, Sudanese and Eritrean children) ranging from 55.2% to 97.8%; four camps exceeded 90% coverage during at least one survey.

Results Tables

Table 3a.Camp-Level global acute malnutrition (GAM) and anemia prevalence rates among children aged 6-59 months from eight countries of origin in 22 camps, 2004-2010*

Country of Origin & Survey Year (% US refugees, 2005-2009)	Secondary Country Camp	Survey Years	GAM (WHO) 95% CI**	Anemia	Vitamin A Distribution
Burma		2005	18.9% (11.5, 28.7)		
43573 (15.7%)	(Bangladesh) Nayapara and Kutupalong camps	2008	7.8%		
		2009	18.7% (16.2, 21.2)	28.9%	88.2%
		2010	14.6% (12.4, 20.1)	52.6%	
Somalia		2005	28.3% (20.1, 39.0)		55.2%
34074 (12.26%)	(Kenya) Dadaab camps	2006	24.3% (16.7, 34.1)		
		2007	12.4% (10.4, 14.7)		87.0%
		2009	12.6% (9.4, 15.9)		91.9%
Bhutan		Jul-05	10.5%		97.8%
18564 (6.68%)		Dec-06	12.7% (12.3,16.1)		98.8%
		Mar-06	13.9% (10.9,16.9)		86.4%
	Nepal camps	Jan-07	4.2%		97.5%
		Dec-08	10.5% (7.9, 12.8)		
		May-09	7.3% (5.4, 9.6)	35.9%	98.9%
		May-10	8.1% (6.4, 10.6)	40.2%	
Liberia	(Ghana)	2005	9.3% (5.5, 15.2)		95.5%
9495 (3.41%)	Bududuram camp	2006	13.2% (8.2, 20.6)		72.5%
Burundi	(Tanzania)	2004	6.8% (3.8, 11.7)		
8840 (3.18%)	Lukole A	2005	5.6% (2.6, 11.4)		
	Lukole B	2004	7.1% (3.9, 12.1)		
		2005	7.1% (3.5, 13.6)		
	Mukugwa	2004	4.9% (1.8, 12.1)		
		2005	3.9 (0.7, 14.6)		
	Mtabila II	2004	6.6% (3.6, 11.4)		
		2005	2.8% (1.1,7.2)		
	Mtendeli	2004	6.9% (3.9, 12.0)		
		2005	4.9% (2.2, 10.2)		
	Nduta	2004	6.3% (3.4, 11.0)		
		2005	3.1% (1.2, 7.5)		
Sudan	(Kenya) Kakuma	2004	20.5% (12.7, 31)		
5785 (2.1%)		2005	21.7% (14.6, 31.1)		
		2006	13.2% (11.2, 15.4)		
		2010	7.9% (6.1, 10.1)	73.7%	76.7%

*Source: NICS
http://www.unscn.org/en/publications/nics/database.php
**CI, confidence interval

Table 3b. Camp-Level global acute malnutrition (GAM) and anemia prevalence rates among children aged 6-59 months from eight countries of origin in 22 camps, 2004-2010*

Country of Origin & Survey Year (% US refugees, 2005-2009)	Camp	Survey Years	GAM (WHO) 95% CI*	Anemia	Vitamin A Distribution
Eritrea		2006	18.1%		
3528 (2.08%)	(eastern Sudan) Um Gargour	2009	25.5% (22, 29)	65.9%	
		2010	17% (13.8, 20.8)		
	Kilo26	2006	17.30%		84.1%
		2009	15% (11.1,18.9)	60.0%	
		2010	13.1% (10.5, 15.5)		
	Suki	2006	20.3%		
		2009	7.5%	70.0%	
		2010	14.3% (7.6, 25.3)		
	Abuda	2006	13.6%		
		2009	13.7%	49.0%	
		2010	18.2% (14.2, 23.2)		
	Wad Sherifey	2006	23.70%		
		2009	15.2% (11.3, 20.1)	59.6%	84.6%
		2010	15.5% (12.4, 19.2)		
	Shagrab	2006	15.6%		
		2009	21.2% (17.3, 25.2)	50.3%	73.3%
		2010	14.9% (12.3,17.9)		
	Girba	2006	17.40%		
		2009	17.2% (12.8, 21.6)	56.2%	
		2010	16.0% (12.6, 22.4)		
	Fau5	2006	19.70%		
		2009	7.1%		
		2010	12% (9.2, 15.5)		
Democratic Republic	(Tanzania)	2004	6.6% (3.7, 11.6)		
of Congo 3501 (1.3%)	Nyragusu	2005	2.2% (0.7, 5.9)		
	Lugufu I	2004	5.2% (2.7, 9.5)		
		2005	1.6% (0.4, 4.8)		
	Lugufu II	2004	6.5% (3.6, 11.4)		
		2005	1.6% (0.4, 4.9)		

*Source: NICS http://www.unscn.org/en/publications/nics/database.php
**CI, confidence interval

WHO crisis classification for GAM prevalence:	
Acceptable	<5%
Poor	5-9%
Serious	10-14%
Severe	> 15%

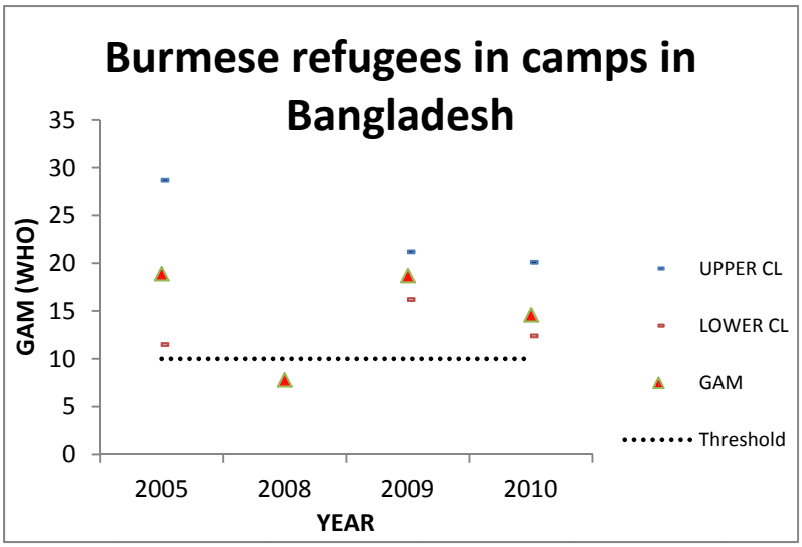
WHO classification for anemia prevalence (public health concern)	
Acceptable	<5%
Mild	5%-19.99%
Moderate	20%-39.99%
Severe	>40%

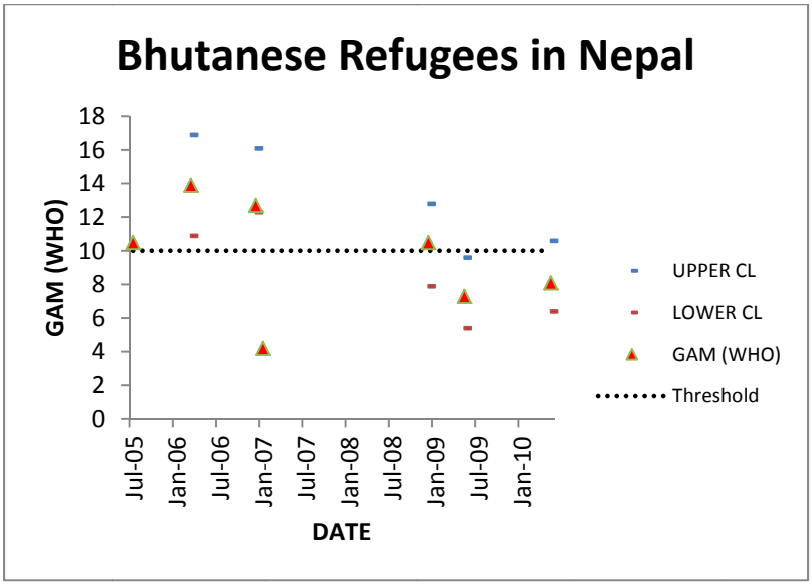
Figures

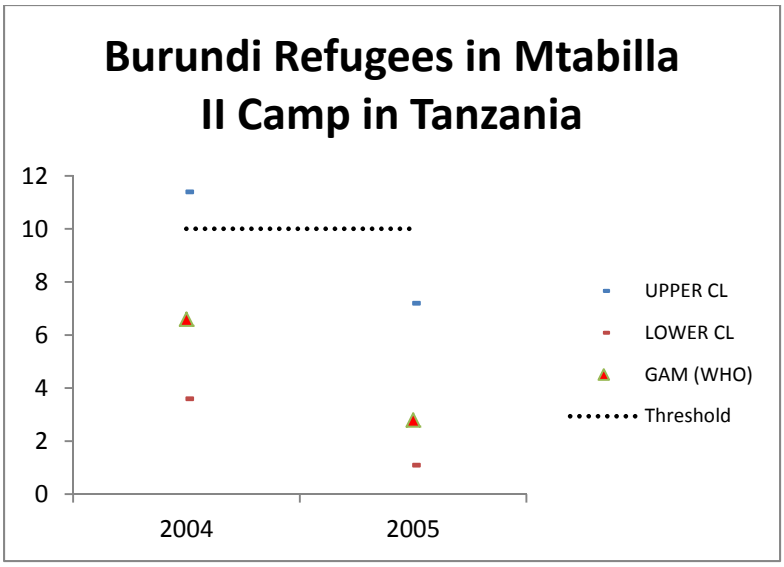
Global Acute Mortality (GAM)* Prevalence Among Refugees from Eight Countries of Origin by Camp Setting from 2004-2010

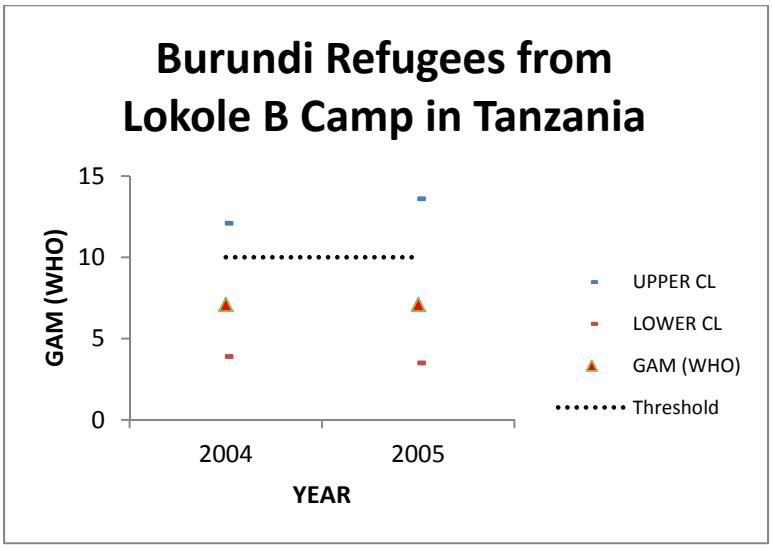
*a basic population-based nutrition indicator assessed by measuring the height and weight of all or a sample of children 6-59 months of age. The proportion of children with a z-score of a weight-for-height index of greater than 2-standard deviations compared with the population mean, characterized as "wasting," determine the GAM rate of the population. GAM prevalence of greater than 10% is considered serious and beyond the UNHCR threshold of acceptability

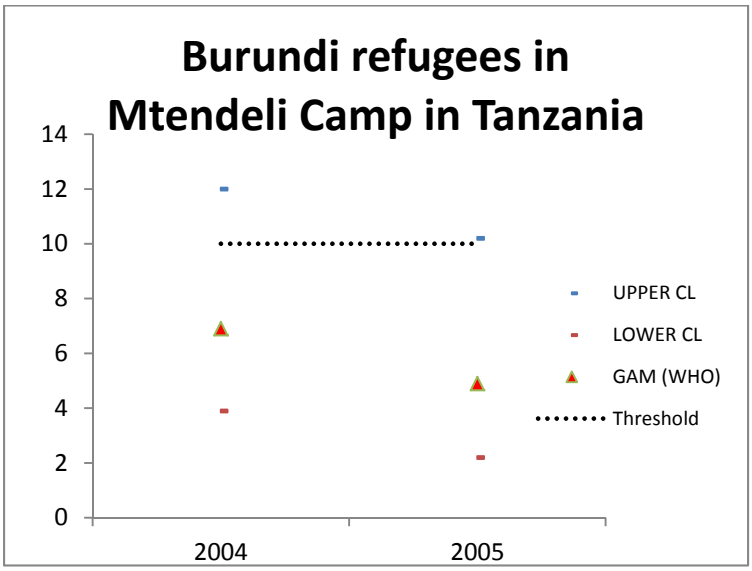
East Asian Origin:

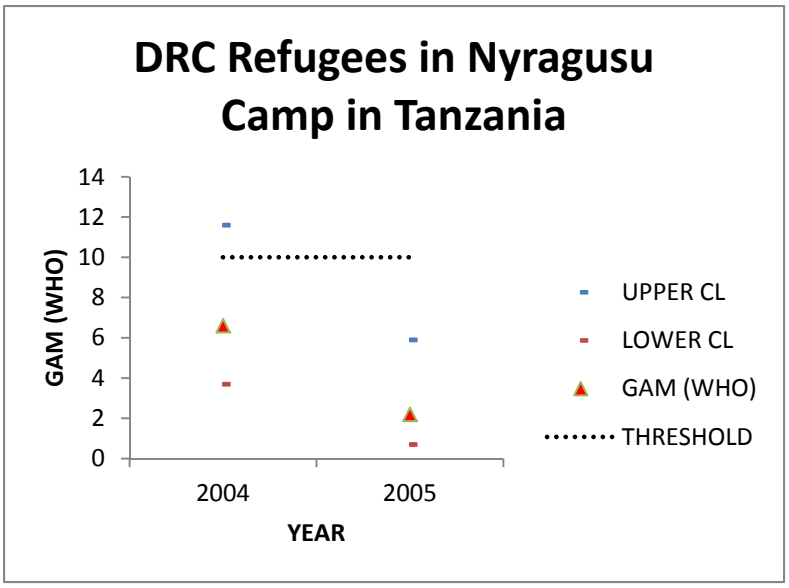


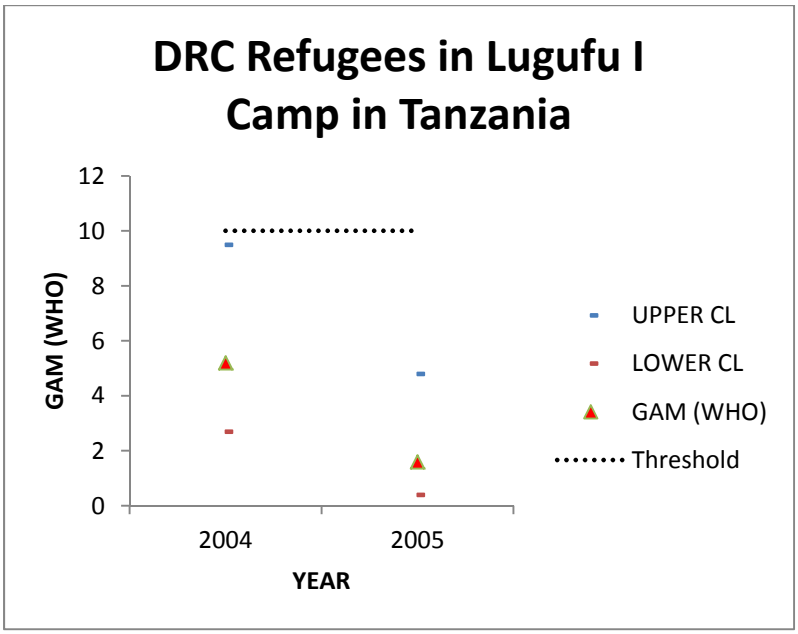


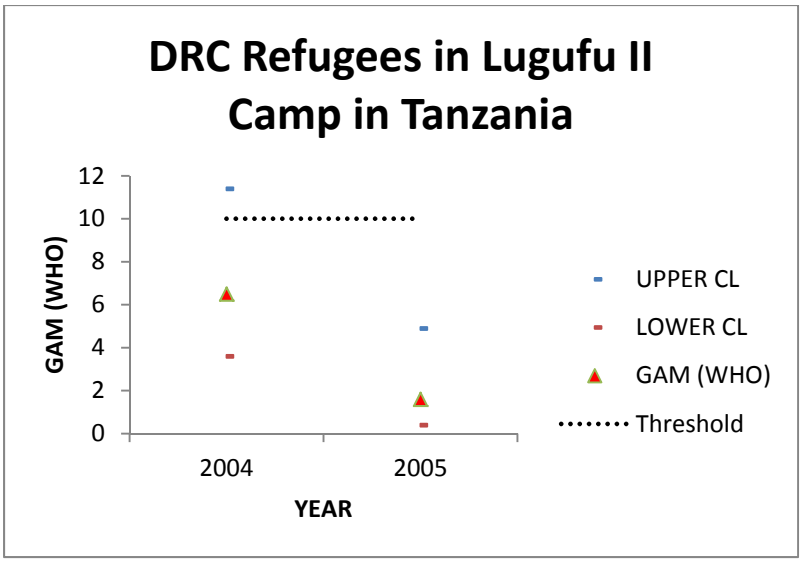

Burundi Refugees in Mtabilla II Camp in Tanzania
12
10
8
6
4
2
0
2004
2005
UPPER CL
LOWER CL
GAM (WHO)
Threshold

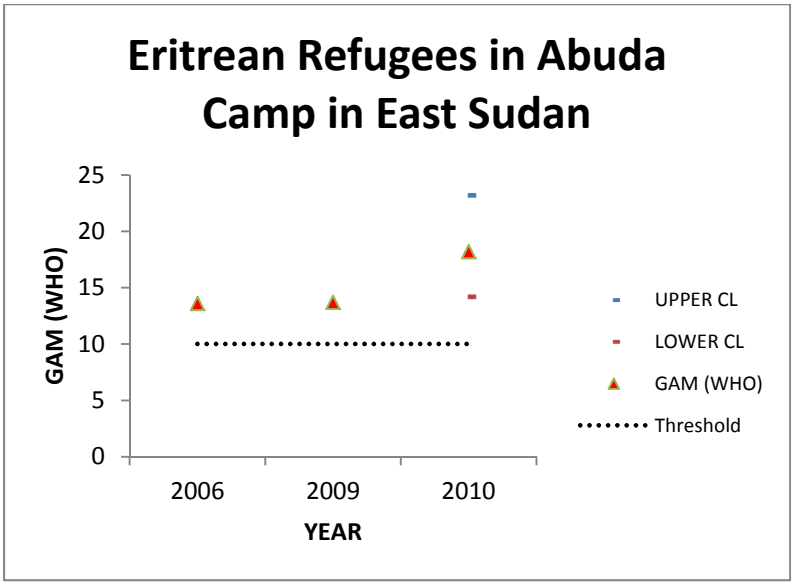

Burundi Refugees from Lokole B Camp in Tanzania
GAM (WHO)
15
10
5
0
2004
2005
YEAR
UPPER CL
LOWER CL
GAM (WHO)
Threshold


Burundi refugees in Mtendeli Camp in Tanzania
14
12
10
8
6
4
2
0
2004
2005
UPPER CL
LOWER CL
GAM (WHO)
Threshold


DRC Refugees in Nyragusu Camp in Tanzania
GAM (WHO)
14
12
10
8
6
4
2
0
2004
2005
YEAR
UPPER CL
LOWER CL
GAM (WHO)
THRESHOLD

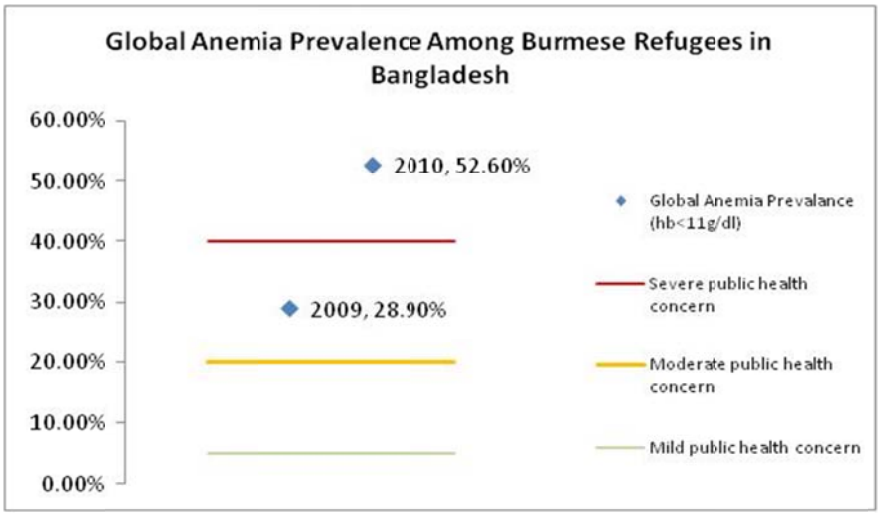

DRC Refugees in Lugufu I Camp in Tanzania
GAM (WHO)
12
10
8
6
4
2
0
2004
2005
YEAR
UPPER CL
LOWER CL
GAM (WHO)
Threshold

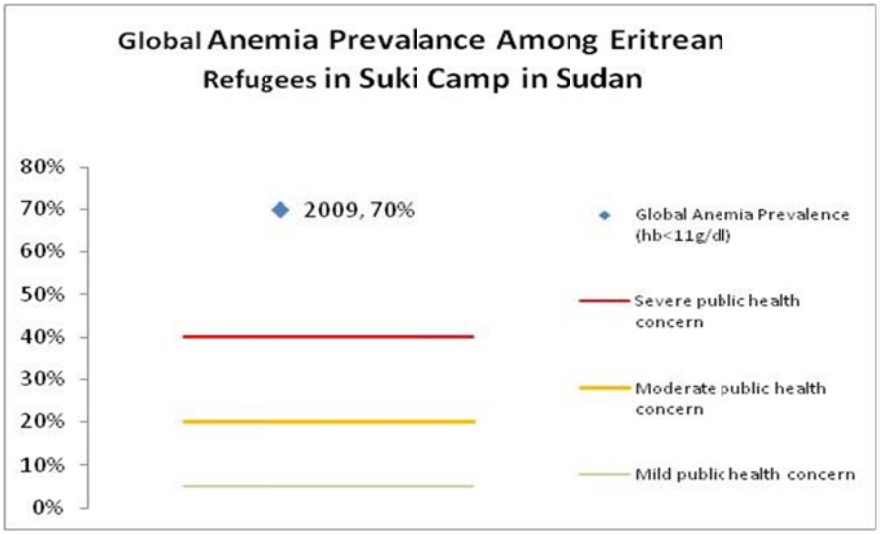

DRC Refugees in Lugufu II Camp in Tanzania
GAM (WHO)
12
10
8
6
4
2
0
2004
2005
YEAR
UPPER CL
LOWER CL
GAM (WHO)
Threshold

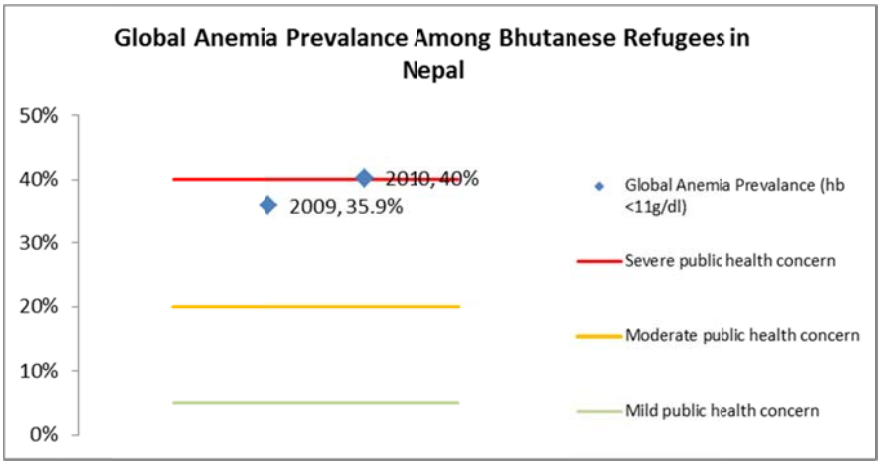

Eritrean Refugees in Abuda Camp in East Sudan
GAM (WHO)
25
20
15
10
5
0
2006
2009
2010
YEAR
UPPER CL
LOWER CL
GAM (WHO)
Threshold

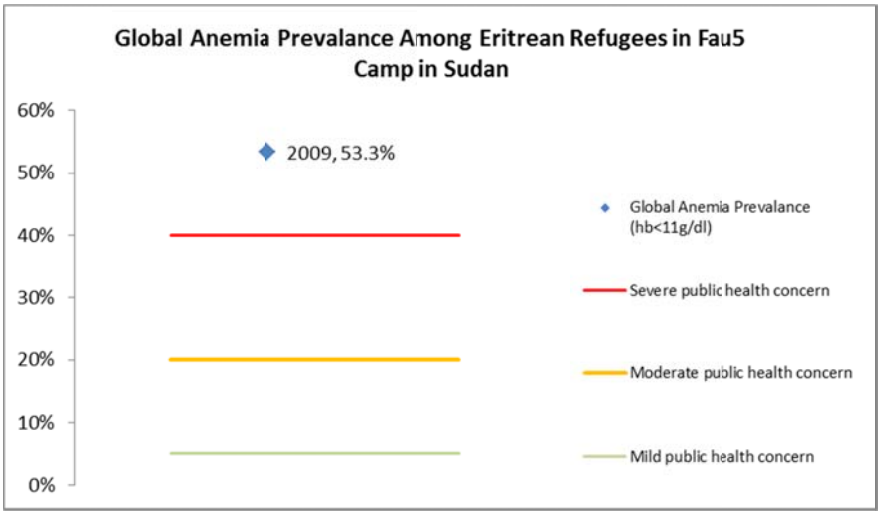
Global Anemia Prevalence* among Refugees from Four Countries of Origin by Camp Setting from 2004-2010

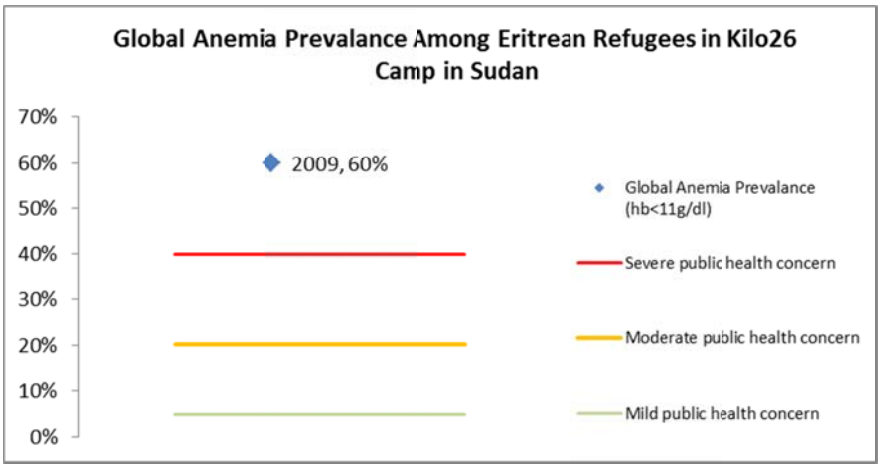
*determined by hemoglobin blood levels less than 11g/dl. WHO classifies an anemia prevalence from 5-20% as a mild public health concern, a rate from 20-40% as a moderate public health concern, and a prevalence of 40 % or greater as a severe public health concern.

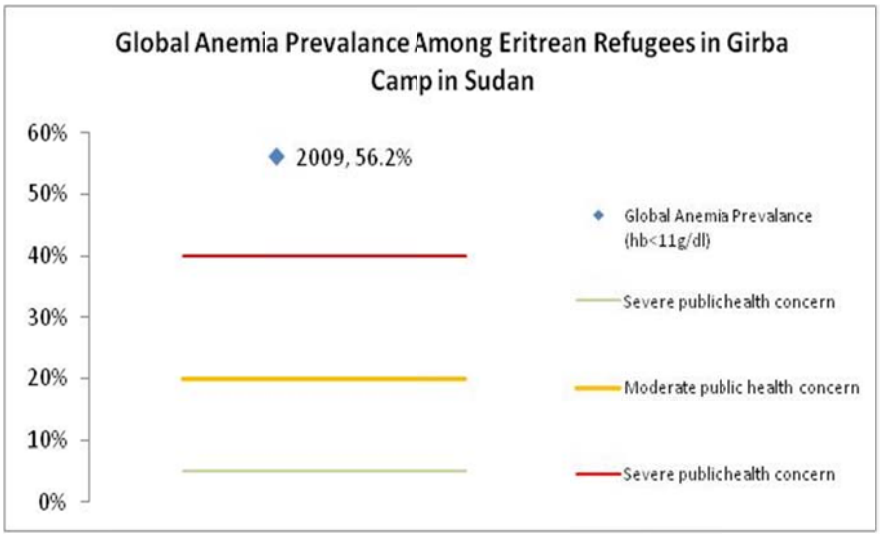


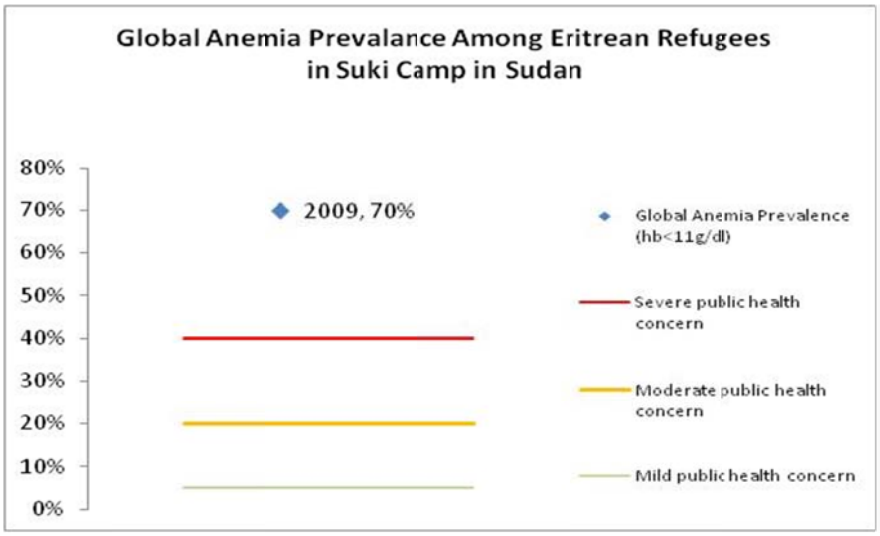


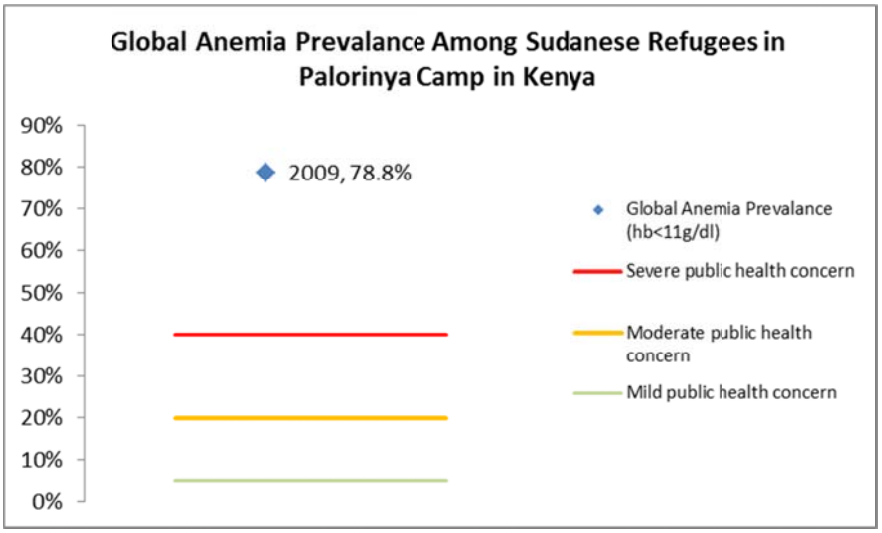


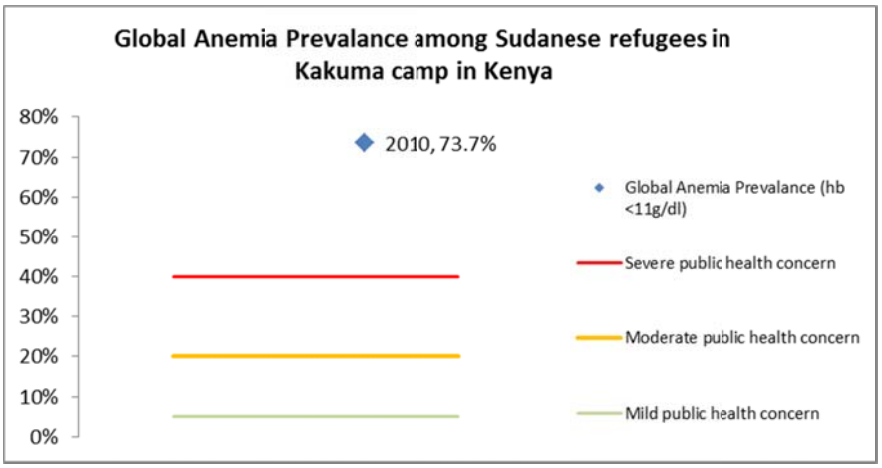

Global Anemia Prevalance Among Eritrean Refugees in Fau5 Camp in Sudan
60%
50%
40%
30%
20%
10%
0%
2009, 53.3%
Global Anemia Prevalance (hb<11g/dl)
Severe public health concern
Moderate public health concern
Mild public health concern


Global Anemia Prevalance Among Eritrean Refugees in Kilo26 Camp in Sudan
70%
60%
50%
40%
30%
20%
10%
0%
2009, 60%
Global Anemia Prevalance (hb<11g/dl)
Severe public health concern
Moderate public health concern
Mild public health concern


Global Anemia Prevalance Among Eritrean Refugees in Girba Camp in Sudan
60%
50%
40%
30%
20%
10%
0%
2009, 56.2%
Global Anemia Prevalance (hb<11g/dl)
Severe publichealth concern
Moderate public health concern
Severe publichealth concern


Global Anemia Prevalance Among Eritrean Refugees in Suki Camp in Sudan
80%
70%
60%
50%
40%
30%
20%
10%
0%
2009, 70%
Global Anemia Prevalence (hb<11g/dl)
Severe public health concern
Moderate public health concern
Mild public health concern


Global Anemia Prevalance Among Sudanese Refugees in Palorinya Camp in Kenya
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2009, 78.8%
Global Anemia Prevalance (hb<11g/dl)
Severe public health concern
Moderate public health concern
Mild public health concern


Global Anemia Prevalance among Sudanese refugees in Kakuma camp in Kenya
80%
70%
60%
50%
40%
30%
20%
10%
0%
2010, 73.7%
Global Anemia Prevalance (hb <11g/dl)
Severe public health concern
Moderate public health concern
Mild public health concern

Fourteen RHCs completed the survey, representing the resettlement destinations of 71% of US-resettled refugees from 2005-2009. Ten RHCs reported that over 90% of refugees received the State medical screening; two RHCs estimated 70%−90% completed the medical screening; and two were unable to estimate the coverage rate of screenings because refugees received care from private providers who were not required to report to the State.

Twelve RHCs (85%) reported medical screenings included weight and 11 (79%) included height measurements for children aged less than 5 years; one RHC presumed that measurements, but no documentation, were taken by providers. Ten (71%) indicated weight-for-height, height-for-age, and weight-for-age were assessed; however, personally interviewed-RHCs stated that these were not reported. Four (29%) used National Center for Health Statistics (NCHS) or WHO standards to assess anthropometrics. Twelve (85%) stated screenings included hemoglobin levels.

Referral practices varied by county, health clinic and provider: three (21%) of surveyed RHCs refer all children aged less than 5 years to pediatricians; 36% refer those with "abnormal" anthropometric measurements (determined subjectively); and 43% reported no pediatric referrals. Answering the open-response question, "*Please describe your referral process for <u>additional</u> nutritional follow-up or services?,"* four of 13 RHCs reported that each provider determined follow-up need; one reported that all children under 16 years old with height-for- age or weight-for-age below the 5th percentile were referred for nutritional evaluation, but referrals were not documented on State reporting forms. Two RHCs stated local health clinics were responsible for screenings and referral protocol and three did not collect screening records or follow-up, but assumed that providers referred children with "abnormal" anthropometric measurements for further care; three had resettlement agencies determine need for nutritional services. WIC (Women, Infants and Children) was regularly offered to refugees at the domestic

screening for 11 (78%) of RHCs surveyed; two (14%) provided multivitamins to children at the screenings.

Of the 14 RHCs, seven had refugee medical screening forms available online. Six included height and weight measurement and checkboxes indicated "normal" or "abnormal" but none included checkboxes for stunting, wasting, or underweight. All forms had WIC as a referral option and three had "nutrition" as a referral options.

Discussion

All of the camps sampled in this study had 5% or greater GAM prevalence rates at least one time from 2004-2010. In addition for 2009 and 2010, all 10 reporting camps had at least one survey with anemia prevalence rate of 40% or higher. The high rates of malnutrition and anemia overseas matched data found in a convenience sample of less than 200 children from the domestic refugee medical screenings at the DeKalb County Board of Health in Atlanta, Georgia (personal communication, Dr. Oladele, February 14, 2012), especially among the African refugee children who had acute malnutrition and anemia prevalence rates of 16% and 36%, respectively. These findings demonstrate the need for linking pre- and post-resettlement assessments to inform further monitoring and interventions.

Although about 80% of the State RHCs surveyed required both height and weight measurements, less than 30% used growth standards to assess anthropometrics. The majority (79%) referred refugee children to WIC, but 43%% indicated no pediatric referrals based on nutrition.

Nutritional deficiencies, particularly during childhood, contribute to poor outcomes in cognitive and physical development, and chronic diseases, such as diabetes, cardio-vascular disease and obesity [15]. In addition, iron deficiency anemia, common issues among refugees, are associated

with delayed cognitive development in infants, early and pre-term birth for deficient mothers and impaired productivity and memory function among adults.

The data used provided point-prevalence of nutrition; NICS survey data represent the entire camp-based cohort and not necessarily the US-bound subpopulation. NICS data were missing for several years; this may indicate selection bias, as in times of greatest devastation or disease outbreaks, nutrition surveillance may be neglected. Some survey data did not report confidence intervals, leaving the validity and precision questionable. Anemia prevalence and vitamin A coverage were not provided in all surveys.

The survey conducted among RHCs was general and did not capture local activities addressing refugee nutrition. The wording of the questions may be inappropriate for non-State level information collection.

Recommendations

UNHCR states nutrition surveys should be conducted annually in stable locations but, more frequently where food assistance programs operate [81]. Starting in 2011, the International Organization for Migration (IOM) publishes the *Nutrition Surveillance Reports* that includes height, weight, age and gender for children aged less than 59 months when they perform the pre-departure screening for 50 or more children. These reports are intended for use by UNHCR and resettlement countries for planning of nutritional interventions [82].

The domestic refugee health screenings present an opportunity to find malnourished children and prevent further nutritional degradation. Many of the RHCs surveyed cited the 1995 ORR protocols as their statewide assessment standards. [83] Thus ORR's recommendations shape refugee health systems. ORR should promote the Centers for Disease Control and Prevention's

October 2011 Nutrition Assessment Guidelines that requires use of standard growth charts to determine a child's nutritional status rather than a subjective determination of "normal" and "abnormal" [84]. A protocol for referral to cultural-trained pediatricians or nutritionists who receive epidemiologic trend information from the RHCs will address long-term nutritional maintenance. Receiving States must use information from overseas surveys and IOM medical exams.

Malnutrition and micronutrient deficiencies require detection and immediate- and long-term follow-up to minimize their impact on the future economic productivity and self-reliance of US-resettled refugees.

Contribution to the Literature

This report is novel in its attempt to describe the continuum of nutrition access and indicators among camp refugee populations who resettle in the US. The findings support longitudinal cohort analysis of refugee populations, specifically children living in camps, who resettle in the US.

Chapter VI Conclusion and Recommendations

Approximately 46% (127,460) of all refugees entering the US between 2005 and 2009 came from the eight countries of origin selected; presumably all of these refugees lived in a camp prior to US arrival. All of the camps sampled in this study had "poor" to "severe" rates of acute malnutrition among children less than 5 years of age during at least one time point from 2004-2010.

Data from refugee health screening at the DeKalb County Board of Health (personal communication, Alawode Oladele, February 14, 2012) suggest that malnutrition persists at "serious" crisis levels and anemia at levels of "moderate public health concern" by WHO standards among communities of refugee children resettling in the US. A convenient sample of DeKalb County, Georgia resettled refugee children examined from October 2010 through July 2011 (approximately 30 days after arrival) was analyzed for malnutrition and anemia by MD/MPH candidate Ankoor Shah. The sample consisted of 35 Bhutanese refugees, 102 Burmese refugees and 39 African refugees between 6-59 months of age. The African refugee children had the highest prevalence of acute malnutrition (less than 2 z-scores below mean weight-for-height on the WHO growth chart) and anemia (hemoglobin < 11g/dL), 16.2% (95% CI 6.2, 32) and 35.9%, respectively. This implies that GAM and anemia prevalence overseas may predict a similar prevalence and classification of malnutrition among these populations upon resettlement.

Aside from anemia, micro-nutrient malnutrition remains excluded from routine surveillance both overseas and in the US. The high rates of malnutrition among those surveyed overseas, and found in the select studies of domestic health screening data, including those from DeKalb

County, demonstrate the need for a systematic comprehensive surveillance linking data from pre- and post-resettlement to inform further surveillance and interventions.

Currently, the new arrival screenings vary between States but minimally assess and address nutrition issues. Surveys with State RHCs indicate that 85% assessment report forms include height and weight measurements but only 29% use growth standards to assess anthropometrics. However, the majority do not indicate assessments for stunting, wasting or under or overweight nor use standard growth charts. As with our study, referrals and follow-up services vary by provider while 79% refer to WIC, 29% specific no nutrition-related protocol for referral to pediatric care or a dietician.

The conversations revealed the variety in State systems providing new arrival screenings. Some use only public health clinicians while others contract out to private-providers and/or utilize community health centers. In some states, refugee populations settle densely in one area allowing for high coverage rates and a greater feasibility for integrated services, including nutrition. In larger States or States with dispersed refugee populations, this becomes more challenging. Among the eight RHCs contacted for follow-up conversations, roughly half use electronic reporting systems and three are in the process of establishing these systems in the next year. In those States with electronic reports, contracted physicians complete a standardized examination form that is submitted in real-time to the RHC. This provides a central surveillance mechanism enabling States to conduct trend analysis. These aggregated data are useful for policy and program planning, informing providers of issues that merit attention and for reporting to Department Health and Human Services for the funding of nutritional or other services as needed. One State, currently only collecting reportable communicable disease data, plans to collect vitamin B12 levels, hepatitis C status, and nutrition data upon they have an electronic

reporting system. Two states include assessment for vitamin B12. Texas, in collaboration with the CDC, studies vitamin B12 deficiency among Bhutanese, measuring levels every three months.

Limitations

The data used in this study provide point-prevalence of nutrition indicators among cohorts of the refugees in camps, potentially pre-departure to life in the US. The data from the NICS surveys represent the entire camp-based cohort and not necessarily the subpopulation coming to the US.

As mentioned earlier, data were missing for several years in the NICS database. This may indicate selection bias, as in times of greatest devastation or disease outbreaks, nutrition surveillance may become a lower priority. Wasting was measured in the surveys which is an indicator of acute malnutrition, further analysis for stunting would represent whether more chronic malnutrition resulting from suboptimal nutrition and health conditions. Some of the survey data did not report confidence intervals, leaving the validity and precision questionable. Anemia and vitamin A coverage was not covered in all surveys.

The survey conducted among RHCs was general and does not capture county and local activities to address refugee nutrition. States differ not only in their management of refugee health but also in the countries of origin and geographic settlement trends of refugees (proximity to the State health department). The wording of the questions may not have been appropriate for non-State-level information.

The limitations of the data used in this study, such as, missing survey rounds and missing data indicators in the NICS database and the overall lack of US local data collection on nutrition

indicators demonstrate a need for improved surveillance both domestically and overseas and a method to streamline and communicate trends in nutrition data.

Recommendations

While UNHCR states that nutrition surveys should be conducted once per year in stable locations, or with a sudden influx of new arrivals to camps.[81] However, the UN NICS database, which contains all publicly available UNHCR surveys, indicates that surveys were not conducted several years. Camp-level surveillance needs consistency.

Towards this recommended goal, starting in January 2011, the IOM Health Teams began the publication of the IOM *Nutrition Surveillance Reports*. The publication includes analysis of height, weight, age and gender measurements for children less than 59 months in IOM sites performing overseas resettlement examinations for 50 or more children. These reports are intended for use with partner agencies like UNHCR and resettlement NGOs for monitoring and planning of nutritional interventions for refugee children.[82] However, IOM does not perform all overseas refugee examinations.

The domestic refugee health screenings present an opportunity to avert this gap in nutritional treatment for malnourished children and to prevent further nutritional degradation upon resettlement in the face of unfamiliar foods, and language, transportation and monetary barriers. Many RHCs cite the ORR protocols,[83] established in 1995, as their statewide assessment standards. ORR funds domestic health assessments, provides project grants to voluntary resettlement agencies (Volags), provides RMAs, and collects related-data. Thus ORR's recommendations and requirements shape State and local refugee health systems. ORR, as the authoritative and funding body for the domestic screenings should promote the CDC's nutrition guidelines as a required part of the assessment. Standard growth charts should be used to

determine a child's growth status rather than a subjective determination of "normal" and "abnormal." Standard protocol should be established for referral to a pediatrician or nutritionist. Vitamins should be distributed at all screenings. Assessment of micronutrient deficiencies should also be incorporated in examinations, specifically for zinc, iodine, and iron, as well as potentially vitamin A, the four most common deficiencies among crisis afflicted populations.

Evidence-based protocols for State new arrival medical assessments should use information acquired in overseas surveys, and the overseas medical exams and reflect current new arrival trends collected throughout other states. These protocols should be updated to meet the always changing populations and needs of refugees entering the US. Each contracted refugee health screener should have an established relationship with one or more pediatrician and nutritionist. The collaborating pediatrician and nutritionist should receive cultural and epidemiologic trend information from the RHCs. Malnutrition and micro-nutrient deficiencies require detection and immediate and long-term follow up.

Two potential health screening models reduce patient and provider burden facilitating the transition to a pediatrician for growth and development monitoring and nutritive care, if needed. First, in areas with high concentrations of refugees, comprehensive clinical settings staffed with translators and clinicians specializing in refugee health needs are recommended. Integrated approaches include collaboration with WIC services and personnel to assist in registration and partnership with nutritionists trained to work with refugees. Second, where refugees are more dispersed, Massachusetts's private-sector preferred provider network offers an alternative success model for assisting refugees in long-term care with providers who are trained and funded to address their specific and unique needs.[85]

International conventions and the mission of ORR instill the responsibility of the US to protect the nutritional well-being of refugees. Greater data linkage and collaboration on the international, national and local level will bolster the ability to promote the overall health of refugee children in the US. Standards and protocol for assessment, reporting and referral will ensure accountability. Collaboration between States health departments, new arrival assessment providers, pediatricians and nutritionists, Volags and interpreters will promote the health recovery and growth of the individual refugee child.

Several international treaties oblige States to protect the right to adequate food. Nationally, the Department of State commits the US to protect the well-being of refugees through the entire process of resettlement.[57] Therefore, the US assumes responsibility for ensuring proper nutrition and follow up for potential nutritional deficiencies among refugees.

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Appendix I: Summary of Overseas Medical Exam

The overseas medical exam requires a review of all hospitalizations and institutionalizations for chronic mental or physical conditions, a review of illnesses or disabilities resulting in a departure from a normal state of functioning and well-being, questions about psychoactive drug and alcohol use, harmful behaviors, and psychiatric illness. All applicants 15 years of age and over require a medical history, physical examination and chest radiography (CXR) to screen for tuberculosis. Those presenting symptoms or signs of tuberculosis in this initial screening must provide three sputum specimens for microscopic examination for acid fast bacilli (AFB), as well as for culture and confirmation of the *Mycobacterium tuberculosis* complex. In countries with an estimated TB incidence rate greater than 20 cases per 100,000 population according to WHO estimates, children 2-14 years of age must have a tuberculin skin test (TST) or interferon gamma release essay (IGRA). Those with positive results receive a CXR and provide three sputum specimens for AFB microscopic examination and culture for mycobacterium.[86]

The following chart presents the protocol for TB classification and clearance determination.[86]

Table 1: Tuberculosis screening results, travel clearance, and actions.

Medical History	Physical Exam	Chest Radiograph	TST or IGRA*	Sputum Smears	Culture for Mycobacterium	Travel Clearance	Action or TB Classification†
Normal	Normal	Normal	Negative	NA	NA	6 months‡	No TB Classification
Normal	Normal	Normal	Positive	NA	NA	6 months‡	Class B2 TB, LTBI Evaluation
Normal	Normal	Normal	Negative	Negative	Negative	3 months§	No TB Classification
Normal	Normal	Normal	Positive	Negative	Negative	3 months§	Class B2 TB, LTBI Evaluation¶
Normal	Normal	Normal	Negative or Positive	Either positive		No	Class A, Treatment
Any component suggestive of TB			Negative or Positive	Negative	Negative	No	Use clinical judgment¶
Any component suggestive of TB			Negative or Positive	Either positive		No	Class A Treatment
Any component suggestive of TB			Negative or Positive	Negative	Negative	No	Use clinical judgment¶
Any component suggestive of TB			Negative or Positive	Either positive		No	Class A, Treatment
Completed therapy for tuberculosis			Negative or Positive	Negative or Positive	Negative	3 months§	Class B1 TB, Pulmonary
Completed therapy for tuberculosis			Negative or Positive	Negative or Positive	Negative	3 months§	Class B1 TB, Pulmonary

* When required. TST and IGRA results have no bearing on travel clearance.

† All contacts must receive a Class B3 TB, Contact Evaluation classification unless they are Class A or have extrapulmonary disease.

‡ From the time the evaluation is complete.

§ Travel clearance is for 3 months from the time the evaluation is complete; culture results must be known within 8 weeks of collection.

¶ Tuberculosis treatment should not be initiated for applicants who are smear- and culture-negative unless the CXR and clinical findings are highly suggestive of tuberculosis disease. If cleared to travel, their tuberculosis classification will be Class B1 TB, Pulmonary.

The October 2008 addendum to the Technical Instructions for Medical Examination of Aliens includes all quarantineable diseases designated by the WHO.[58] For confirmed cases of cancroids, gonorrhea, granuloma inguinale and lymphogranuloma venereum, the physician must prescribe treatment and write the date and dose on the medical report form. Once the treatment is completed, these sexually transmitted diseases are no longer Class A conditions. Regarding the management of medical conditions outside of the Class A and B conditions, the instructions explicitly state that the panel physician is not responsible.[58]

Another component of the guidelines addresses malaria. Artemisinin-based combination therapy (ACT) is prescribed for overseas pre-departure presumptive treatment. The ACT regimen must be administered and documented as directly observed therapy no sooner than 3 days prior to

departure. In the post-arrival screenings, those who received the pre-departure anti-malarial therapy do not require further treatment or evaluation unless they present with clinical symptoms. Refugees from Sub-Saharan Africa who did not receive pre-departure treatment are recommended to receive presumptive treatment on arrival or have laboratory screening to detect *Plasmodium* infection.

Since June 2010, refugees from the Middle East, South Asia, Southeast Asia and Africa receive albendazole for intestinal helminthes. Since January 2010, all eligible sub-Saharan Africa refugees receive pre-departure praziquantel for schistosomiasis. As of July 4, 2011 presumptive ivermectin therapy for strongyloides is being offered to eligible Burmese refugees who are departing from Thailand.

APPENDIX II CDC Recommended Protocol for Domestic Refugee Screenings that is pertinent to nutritional status

Recommended general tests for newly arrived refugees include complete blood count, urinalysis and infant metabolic screening. Recommended screenings include serum lipid profiles and uric acid. Blood count with red blood cell indices, white blood cell differential and platelet counts detect anemia and iron-deficiency anemia, eosinophilia and thrombocytopenia. Urinalysis can be used to detect *Schistosoma haematobium*, renal diseases, systemic diseases and sexually transmitted infections. Stool testing is also recommended to detect for ova and parasites.

The next set of guidelines address the discussion for collecting the medical history during physical examinations. The first step in the physical examination is to obtain a detailed history including current and past symptoms, conditions, medications, allergies, family medical histories and a mental health assessment. Use of interpreters is recommended. A social history should also be collected reviewing the patient's travel history, which provides insight to geographic exposures, environmental and chemical exposures, and type of previous treatment conditions. Determination of literacy is important to provide health information adequately.

For the physical examination, physicians should explain the procedure to increase comfort. The guidelines state that nutritional status should be assessed for all refugees by taking growth and development measures, such as length/height, weight and head circumference in children and infants. For children, these ratios should be plotted on standard growth charts and whenever possible compared to pre-resettlement records of growth in the IOM bag. The physical exam should include vital signs, dental and visual examination, cardiac auscultation and lymph-node exams and genital exams. Pregnant women must be considered for testing as part of their prenatal screening and care.

Next, the guidelines recommend lead screening. Refugees from different areas of origin have different sources of exposure to lead, such as, "pay-loo-ah," an orange-red powder administered in Southeast Asia for treatment of fever, and make up and beauty products in several cultures. It is recommended to check the blood lead levels of refugee children 6-16 months of age on arrival to the US.