# Chapter 16
# Health Issues in Refugee Children

**Sural Shah, Meera Siddharth, and Katherine Yun**

## Introduction

In the past decade, an estimated 200,000 children have come to the US as refugees [1]. Their exposure to health-related risk and protective factors varies by nationality, socioeconomic status, and time period. In 2005, the majority of US-bound refugees originated in Cuba (12 %), Laos (16 %), Russia (11 %), and Somalia (19 %) [2]. In 2011, individuals from Bhutan (27 %), Burma (30 %), and Iraq (17 %) predominated [2]. Even within the same ethnic or national group, children's experiences and exposures vary. For example, access to early childhood nutrition or preventive health services is often different for children born in refugee camps or other transitional settings when compared to their older siblings. Similarly, disease risk for children from the same camp or region may wax and wane over time as outbreaks flare or preventive health programs, such as micronutrient supplementation or presumptive deworming, take root.

After arriving in the US, growth and nutrition, communicable conditions, vaccine catch-up, and entry into primary and specialty care are the focus of health care. Over time, psychosocial needs and chronic disease management may predominate. Psychosocial support is likely to be particularly important for survivors of violence

S. Shah, M.D. (✉)
Internal Medicine and Pediatrics, Children's Hospital of Philadelphia, Hospital of the University of Pennsylvania, 34th and Civic Center Blvd, Philadelphia, PA 19104, USA
e-mail: sz357@partners.org

M. Siddharth, M.D., F.A.A.P.
Primary Care, Karabots Primary Care Centre, Children's Hospital of Philadelphia, 4865 Market Street, Philadelphia, PA 19139, USA
e-mail: SIDDHARTH@email.chop.edu

K. Yun, M.D.
Pediatrics, Perelman School of Medicine & The Children's Hospital of Philadelphia, University of Pennsylvania, 3535 Market Street, 15th Floor, Philadelphia, PA 19104, USA
e-mail: yunk@email.chop.edu

A. Annamalai (ed.), *Refugee Health Care: An Essential Medical Guide*,
DOI 10.1007/978-1-4939-0271-2_16, © Springer Science+Business Media New York 2014

and for those who have come to the US without their parents or legal guardians, receiving assistance as unaccompanied refugee minors [3].

This chapter will focus on refugee groups who have arrived in the US in the prior decade. The intent is to review core information and concepts, bearing in mind that children's specific health needs, exposures, and experiences are heterogeneous. Because most studies have focused on children's health during the time immediately following arrival, known as *reception and placement*, the majority of recommendations focus on this period.

## Nutrition and Growth

Nutrition and growth are among the most common concerns for health professionals caring for refugee children in the US. The social forces that uproot families can also disrupt access to food; expose children to infectious diseases associated with malnutrition; and limit access to medical care. Children may also come to the US from regions where childhood obesity is an emerging concern.

The prevalence of growth and nutrition problems among refugee children varies by population. In a study of children who resettled in Massachusetts in the late 1990s, *wasting* (low weight-for-height, which is often associated with acute malnutrition. For additional information about anthropometry, see Table 16.1) was present among 8 % of children from developing regions in Africa and Asia but few other children.[1] Similarly, *stunting* (low height-for-age; often associated with chronic malnutrition) was present among a high proportion of children from Africa (13 %), the Near East (19 %), and East Asia (30 %) but very few children from Yugoslavia and the former USSR [4]. These findings are consistent with more recent studies from refugee camps in Africa and Asia. A survey of five long term refugee camps in East and North Africa demonstrated wasting in 9–21 % of children aged 6–59 months [5]. Similarly, a 2007 survey of Bhutanese children aged 6–59 months living in one of seven refugee camps in Nepal found that stunting was present in 27 % of children and wasting in 4 % [6].

Children from other regions may be at higher risk of overweight and obesity. For example, an analysis of pre-departure data from Jordan found that 14 and 11 % of US-bound children from Iraq were overweight and obese, respectively [7]. Children may also experience excessive weight gain subsequent to resettlement, either because of increasing food availability, adoption of an "American" diet, or decreased physical activity [8, 9].

Children of any weight and stature may experience malnutrition in the form of micronutrient deficiencies (Table 16.2). Among refugee children, common micronutrient deficiencies include vitamin A, iron, vitamin B12, and vitamin D

[1] In this study, each region predominantly comprised children from one or two national or ethnic groups, as follows: Africa (89 % Somalia), Near East (98 % Iraqi or Kurdish), East Asia (90 % Vietnam), former Yugoslavia (96 % Bosnian), former USSR (41 % Ukrainian, 27 % Russian).

**Table 16.1** Selected anthropometric assessment of children's growth and nutritional status

| Growth classification[a] | Measurement[b] | Definition | Limitations |
|---|---|---|---|
| Wasting[c] | Weight-for-height | *Z*-score below −2 on the sex-specific weight-for-height WHO growth chart | |
| Stunting[c] | Height-for-age | *Z*-score below −2 on the sex-specific height-for-age WHO growth chart | Requires accurate assessment of age |
| Stunting[d] | Height-for-age | Below the 5th percentile of the sex-specific height-for-age CDC growth chart | Requires accurate assessment of age<br>Based on US norms |
| Underweight[c] | Weight-for-age | *Z*-score below −2 on the sex-specific weight-for-age WHO growth chart | Requires accurate assessment of age |
| Underweight[d] | Body mass index (weight in kilograms divided by the square of the height in meters; BMI) | Below the 5th percentile of the sex-specific BMI-for-age growth chart | Requires accurate assessment of age<br>Based on US norms<br>Applicable for children 2–19 years |
| Overweight[d] | Body mass index (BMI) | 85th to less than the 95th percentile of the sex-specific BMI-for-age growth chart | Requires accurate assessment of age<br>Based on US norms<br>Applicable for children 2–19 years |
| Obesity[d] | Body mass index (BMI) | Equal to or greater than the 95th percentile of the sex-specific BMI-for-age growth chart | Requires accurate age assessment<br>Based on US norms<br>Applicable for children 2–19 years |

[a]The CDC's Division of Global Migration and Quarantine recommends that clinicians use WHO standardized growth references for children younger than 2 years of age and CDC/NCHS references for older children (CDC 2012)
[b]In children under 2 years of age, recumbent length is measured rather than standing height
[c]WHO (1995) Physical status: the use and interpretation of anthropometry, WHO Technical Report Series #854; WHO (2007); WHO. Child growth standards. http://www.who.int/childgrowth/en/
[d]CDC (2002) CDC growth charts. http://www.cdc.gov/growthcharts/cdc_charts.htm; Barlow SE et al. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. Pediatrics. 2007;120:S164–92

[5, 6, 9–12]. Studies on refugees in Africa and Asia have highlighted the susceptibility of children dependent on long-term food aid [5, 11, 13], demonstrating rates of vitamin A deficiency of 21–62 % and iron deficiency of 23–75 % among young children aged 6–59 months. Vitamin B12 deficiency has been less widely studied. However, data from the CDC Migrant Serum Bank suggest that 32–59 % of adolescents and young adults (15–29 years) from Bhutan may be affected [14].

**Table 16.2** Brief overview of micronutrient deficiencies in refugee children

| Micronutrient | Clinical presentation | Screening and treatment |
|---|---|---|
| Iodine | Risk: residence in mountainous and inland areas with little naturally occurring iodine in the soil<br>Symptoms: thyroid disease, mental retardation (congenital)<br>US-bound refugees: Iodine deficiency has not been reported in children following resettlement in US, but data are limited. Many refugee camps provide iodized salt | Thyroid exam. Laboratory screening is not currently recommended for asymptomatic children |
| Iron | Risk: one to three quarters of children in refugee camps in Asia, Africa, and the Middle East [5, 6, 11, 80] | Screening for iron deficiency begins with assessment of hemoglobin or hematocrit concentrations |
| | Symptoms: microcytic anemia, neurocognitive delay<br>US-bound refugees: Iron deficiency is common, with variable risk by age and region of origin. Care should be taken to distinguish iron deficiency from hemoglobinopathies and G6PD deficiency | Deficient children should be treated with oral iron supplementation |
| Vitamin A | Risk: one in five preschool-aged children worldwide; up to 62 % of young children in some refugee settings [5, 74, 81] | Measurement of serum retinol. However, routine screening of asymptomatic children is not currently recommended |
| | Symptoms: infection; vision problems, including irreversible corneal damage and retinal problems, e.g., night blindness. Physical exam findings include dry skin, hair, or eyes, and Bitot spots<br>Prevention: periodic oral supplementation programs<br>US-bound refugees: Vitamin A deficiency has not been reported in children following resettlement in US, but data are limited | Oral supplementation is highly effective, but severe eye findings may require parenteral treatment and monitoring for toxicity |
| Vitamin B1 (Thiamine) | Risk: altered metabolism (e.g., thyroid disease), losses (e.g., chronic diarrhea)<br>Symptoms: dry beriberi, characterized by progressive weakness and peripheral neurologic abnormalities; wet beriberi, a cardiomyopathy that can progress to congestive heart failure; infantile beriberi (congenital), which mimics shock; Wernicke encephalopathy, a triad of ophthalmoplegia, nystagmus, and ataxia<br>US-bound refugees: Vitamin B1 deficiency has not been reported in children following resettlement in US. Data are limited | Measurement of whole blood transketolase activation. Laboratory screening is not currently recommended for asymptomatic children<br>Mild beriberi in older children is treated with oral supplementation (10 mg/day). Severe beriberi and infantile beriberi require parenteral therapy |

(continued)

**Table 16.2** (continued)

| Micronutrient | Clinical presentation | Screening and treatment |
|---|---|---|
| Vitamin B3 (Niacin) | Risk: diet dependent on corn or millet<br>Symptoms: pellagra, characterized by "diarrhea, dermatitis, and dementia" or GI symptoms (glossitis, angular stomatitis, cheilitis, diarrhea), skin lesions (beginning as painful erythema on sun-exposed surfaces, skin eventually becomes rough and hard), and neurologic symptoms (e.g., irritability, depression, fatigue, memory impairment)<br>US-bound refugees: Vitamin B3 deficiency has not been reported in children following resettlement in US. Data are limited | Measurement of 24-h urine niacin and $N_1$-methylnicotinamide excretion. Laboratory screening is not currently recommended for asymptomatic children<br>Treatment with oral nicotinamide supplementation is effective |
| Vitamin B12 (Cobalamin) | Risk: one in three adolescents from Bhutan [14], maternal vitamin B12 deficiency (breastfed infants), intrinsic factor deficiency, severe gastritis (e.g., *H pylori*)<br>Symptoms: macrocytic anemia; pancytopenia; peripheral neuropathy; nonspecific neurologic symptoms, e.g., fatigue, irritability; severe congenital cases may lead to profound neurocognitive regression, development delay, or obtundation<br>US-bound refugees: Vitamin B12 deficiency is common among adolescents from Bhutan. Data are limited for other national groups | Presumptive supplementation is recommended for refugees from Bhutan. Many clinicians also screen using serum cobalamin levels<br>In adults, high dose oral treatment (e.g.,1000 mcg/day) is effective. Data on optimal dosing in children are limited. Children with severe neurologic symptoms may require IM or parenteral treatment. High dose therapy has not been associated with toxicity |
| Vitamin C (Ascorbic acid) | Risk: limited access to fruits and vegetables, as vitamin C is not stored in the body and must be continually replenished<br>Symptoms: early symptoms include fatigue, aching lower extremities, and follicular hyperkeratotic papules (often on the shins); later symptoms include bleeding gums, perifollicular hemorrhage, and frank scurvy<br>US-bound refugees: Outbreaks have been reported in refugee camps. Deficiency has not been reported in children following resettlement in US. Data are limited | Laboratory screening is not currently recommended for asymptomatic children |

(continued)

**Table 16.2** (continued)

| Micronutrient | Clinical presentation | Screening and treatment |
|---|---|---|
| Vitamin D | Risk: refugee status, diseases associated with fat malabsorption | Measurement of serum 25-hydroxyvitamin D. Many clinicians screen or provide presumptive supplementation |
| | Symptoms: bone pain, dental caries and other tooth defects, impaired growth, rickets<br>US-bound refugees: Vitamin D deficiency and insufficiency are highly prevalent, affecting approximately three-quarters of children [12]. | Oral supplementation with 2000–5000 IU of ergocalciferol (vitamin D2) is effective. Chronic overuse can result in complications from hypercalcemia |
| Zinc | Risk: children with limited access to zinc-rich foods (e.g., meats) are believed to be at risk for mild-to-moderate deficiency [82] | Laboratory screening is not currently recommended for asymptomatic children |
| | Symptoms: zinc deficiency is characterized by immune dysfunction and disruption of mucosal integrity, resulting in acro-orificial skin lesions, diarrhea, susceptibility to infection, and poor growth<br>US-bound refugees: Deficiency has not been reported in children following resettlement in US. Data are limited | Oral supplementation is effective |

Younger children are less likely to be vitamin B12 deficient than adolescents. However, infants with vitamin B12 deficiency—most often breastfed infants with vitamin-deficient mothers—are at risk of severe neurocognitive regression and hematologic abnormalities [15–18].

Micronutrient deficiencies are not exclusive to children who arrive in the US after living in refugee camps. In a diverse sample of refugee children who had recently resettled in Massachusetts, nearly 70 % of young children (≤5 years) and 80 % of school-aged children (6–20 years) were vitamin D insufficient or deficient [12]. Vitamin D abnormalities were common even among individuals from the Middle East, Europe or Central Asia, and Latin America or the Caribbean, many of whom move to the US after living in urban areas rather than refugee camps[2]. Table 16.2 demonstrates the significant impact micronutrient deficiencies can have on childhood health and development and emphasizes its importance in evaluations of resettled youth.

[2] In this study, demographic data were not disaggregated by age. However, individuals from Iraq (28 %), Burma (20 %), and Bhutan (15 %) were the three largest national groups in the overall sample. The majority of individuals from the Middle East were from Iraq, while individuals from Europe/Central Asia were predominantly from Moldova, Ukraine, and Russia and those from Latin America/Caribbean were predominantly Cuban.

The causes of growth abnormalities and malnutrition are multifactorial. In refugee settings, perishable foods can be difficult to transport and store, and movement or financial restrictions may prevent individual foraging or purchases in food markets. Even when children receive an adequate number of calories, they may lack food diversity or access to outdoor activities. As a result, micronutrient deficiencies may be present even when a child's growth has been normal. Children living in refugee settings are often also at risk of acquiring comorbid communicable conditions associated with poor nutrition and growth. These include tuberculosis and *Helicobacter pylori,* which may impair micronutrient absorption [19, 20]. The relationship between growth and intestinal parasite burden is less clear. Research by Geltman et al. in Massachusetts found no association between intestinal parasite infection and the growth of recently arrived refugee children after taking into account demographic characteristics, such as country of origin [4]. This finding is consistent with a Cochrane review of intermittent de-worming, which found minimal association with growth improvement [21].

Growth is also highly dependent upon heritable factors, although population-level variation between national or ethnic groups remains an area of investigation. Early childhood growth potential appears comparable for all children, provided that they have access to optimal nutrition [22]. Data on adolescent growth are less clear, and it is possible that interpopulation variation explains at least some differences in growth between adolescents from different regions [23, 24]. At present, however, children from all groups are evaluated using standard WHO or CDC growth curves.

The CDC has proposed thorough guidelines for the evaluation of nutritional status in recently arrived refugees, including reviewing past medical history, a detailed dietary family and social history, anthropometry, physical examination, and laboratory screening (Table 16.3). Because most anthropometric references provide age-specific standards, clinicians should use ancillary records (e.g., vaccination cards) and narrative history (e.g., season and location of birth, age in relationship to other children) to try to accurately assess the age of children whose birth date is unknown. Children aged 6–59 months should be prescribed an age-appropriate multivitamin with iron. Practitioners should be alert for signs and symptoms of micronutrient deficiencies among children of any age, including children who have exhibited normal growth.

## Infectious Conditions: Consideration for Children

As described in earlier chapters, the diagnosis and treatment of communicable conditions is a core component of primary care for recently resettled refugees. While many aspects of diagnosis and care are similar for adults and children, in this section we highlight issues specific to children.

**Table 16.3** Evaluating refugee children for problems of growth and nutrition

| | | |
|---|---|---|
| *History* | | |
| | Medical | Birth history (e.g., prematurity, SGA) |
| | | Major infections |
| | | Blood transfusions |
| | | Surgical procedures |
| | | Chronic diarrhea |
| | | Rashes |
| | | Vision problems |
| | | Hearing problems |
| | | Dental or gingival problems |
| | | Fractures |
| | | Developmental milestones |
| | | Prior malnutrition diagnosis and/or treatment |
| | Dietary | General habits |
| | | Breast-feeding (where age appropriate) |
| | | Dietary restrictions |
| | | Cultural dietary norms |
| | | Food allergies |
| | | Prior micronutrient supplementation |
| | Social | Food insecurity |
| | | Economic support |
| | Family | Maternal history of malnutrition or micronutrient deficiency (for breast-fed infants) |
| *Exam* | | |
| Growth | Anthropometry[a] | Weight-for-height (wasting) |
| | | Height-for-age (stunting) |
| | | Weight-for-age (underweight) |
| | | Body mass index (underweight, overweight) |
| Micronutrient Deficiencies | Oral cavity | Caries |
| | | Gingivitis or gingival bleeding |
| | Eyes | Bitot spots |
| | | Xerophthalmia |
| | Skin | Dermatitis |
| | | Alopecia |
| | | Stomatitis |
| | | Purpura or petechiae |
| | Endocrine | Goiter |
| | Cardiac | Flow murmur |
| | | Stigmata of heart failure |
| | Musculoskeletal | Bone pain |
| | | Bony deformities (skull, ribs, extremities) |
| | | Muscle weakness |
| | | Tetany |
| | Neurologic | Cognition/development |
| | | Ataxia |
| | | Peripheral neuropathy |

(continued)

**Table 16.3** (continued)

| | | |
|---|---|---|
| *Labwork* | | |
| | General | Complete blood count with differential |
| | | Iron studies[b] |
| | | Lead[c] |
| | | Vitamin D[d] |
| | Population specific | Vitamin B12[e] |
| *Supplementation* | | |
| | Population specific | Multivitamin with iron (children 6–59 months) |
| | | Vitamin B12 (refugees from Bhutan)[e] |
| *Referral* | | |
| | General | National school lunch program |
| | | Supplemental nutrition assistance program (SNAP) |
| | Population specific | Women, infants, and children (WIC; children <60 months) |

Based upon the CDC's Guidelines for evaluation of the nutritional status and growth in refugee children during the domestic medical screening examination (April 16, 2012) unless otherwise noted

[a]The CDC recommends that clinicians use WHO standardized growth references for children younger than 2 years of age and CDC/NCHS references for older children (see Table 16.1 for details)

[b]Evaluation for iron deficiency is recommended as a secondary screening test in children with anemia. Failure to respond to iron therapy should prompt evaluation for other causes of anemia, including hemoglobinopathies and G6PD deficiency

[c]Blood lead levels are recommended for all children 6 months to 16 years at the time of arrival in the US. Follow-up blood lead testing is recommended 3–6 months later (CDC DMQ, Lead screening during the domestic medical examination for newly arrived refugees, April 16, 2012)

[d]Although routine screening for vitamin D deficiency is not currently recommended by the CDC, insufficiency and deficiency are common [12] and clinicians commonly practice routine screening or presumptive supplementation

[e]The CDC recommends oral vitamin B12 supplementation for all refugees from Bhutan (CDC DMQ, Refugee health profile, Bhutanese refugees, nutrition, June 22, 2012). Although routine screening for vitamin B12 is not recommended, some clinicians engage in either targeted screening of infants, adolescents, and adults from Bhutan or universal screening of all newly arrived refugees

## *Tuberculosis*

Although there is variation by country of transit and origin, most studies report tuberculosis prevalence rates of between 14 and 33 % among recently arrived refugee children, the vast majority of whom have latent tuberculosis [25–28]. Tuberculosis is less common among refugee children from Iraq than among refugees from sub-Saharan Africa, where tuberculosis among the general population is also significantly more common [29]. Data are not available on US-bound refugees from Burma or Bhutan. However, studies of tuberculosis treatment programs in camps on the Thai–Burma border and in Nepal suggest that tuberculosis is prevalent amongst refugees arriving from these settings [30, 31].

Tuberculosis screening begins prior to US arrival during the Overseas Medical Examination (OME), and protocols differ for younger and older children [32]. Screening evaluation for those <2 years depends upon history and exam alone. Toddlers and younger children (2–14 years) receive Mantoux tuberculin skin tests (TST) or are tested using interferon gamma release assays (IGRA) (see Chap. 5 for details). Older children (≥15 years) are screened using chest radiograph without TST or IGRA. The use of TST or IGRA to screen younger children was initiated in 2007 and has been implemented on a rolling basis [33]. As a result, there may be increasing concordance between screening conducted overseas and that conducted in the US. Previously, however, children aged 2–14 years were screened using history and exam only. Consequently, many children with normal screening results overseas were diagnosed with tuberculosis after arrival in the US [25]. Thus, the CDC recommends that any child without documented TST or IGRA in their overseas examination should be screened at the domestic evaluation.

Amongst children who undergo screening in the US, diagnosis with latent infection is far more common than active disease [25, 27, 28]. Either TST or IGRA may be used for screening older children, although the latter, which does not cross-react with Bacillus Calmette–Guerin (BCG) vaccine antigens, may be preferred when screening older children who have received BCG. However, the CDC recommends caution in using IGRA for children <5 years, as there are limited data about test performance in this age group and young children may rapidly progress from latent infection to severe forms of active disease, e.g., tuberculosis [34]. TST may be performed in children of any age, though there may be more false negative results in the younger population.

When TST is used, interpretation is the same for children who have and have not received BCG [34, 35].

Although the diagnosis of latent tuberculosis may seem commonplace for clinicians, it is important to remember that even latent tuberculosis can be a source of fear and stigma for families. Adequate explanation about the difference between latent infection and active disease is particularly important, as are assurances about confidentiality and reassurance that tuberculosis is not caused by poor parental care [36–38]. Parents may also be skeptical when children who have received BCG are diagnosed with tuberculosis. However, BCG is effective only in preventing disseminated disease and tuberculosis meningitis in children. It does not prevent primary infection or the reactivation of latent infection.

## *Parasites*

As noted in Chap. 6, pre-departure presumptive treatment for intestinal helminths, schistosoma, and malaria have significantly decreased the risk of infection among children arriving from endemic or holoendemic regions [39, 40]. However, primary care providers should remain alert to signs and symptoms of infection in children. Children with age-based, weight-based, or medical contraindications may receive partial or no pre-departure presumptive treatment[3] [41], or pre-departure treatment may not have been implemented as recommended [42]. Additionally, some common infections, e.g., *Giardia intestinalis,* are not susceptible to single dose Albendazole, currently the most common pre-departure presumptive therapy, and even susceptible organisms may not be eradicated in all children [40]. Similarly, presumptive pre-departure treatment for malaria is not effective against the intrahepatic life-stage of non-*falciparum* species, including *Plasmodium ovale* and *Plasmodium vivax*. Finally, parasitic infections may also be present among children from groups who are not currently recommended to receive pre-departure presumptive treatment. For example, southern Nepal and the Thai–Burma border are both malaria-endemic regions [43], and strongyloides may infect upwards of 10 % of children in endemic areas of Africa [44, 45].

## *Hepatitis B and C*

Hepatitis B prevalence rates for recently arrived refugee children in the US range from <1 to 12 %, with significant variation by age group and region of origin [25, 26, 28, 46, 47]. The addition of hepatitis B vaccination to many national childhood vaccine programs in the 1990s and 2000s has likely led to a decrease in childhood prevalence over time and lower risk relative to adults from the same communities [47]. Regardless, the severe long-term sequelae of childhood infection, risk of household transmission [48], and availability of treatment support routine serologic screening for children from endemic regions [49].

The prevalence of hepatitis C is also believed to be higher in regions of Africa and Asia than US [47, 50]. Relative to children in the US, refugees are at higher risk of having acquired hepatitis C through unsafe medical procedures or maternal-child transmission. However, screening is not routine, and as such data are limited. Although hepatitis C is not currently included in the CDC's recommended screening guidelines for recently arrived refugees, many providers screen children with risk factors, including arrivals from regions where the prevalence exceeds 3 %.

[3] Children <1 year of age, pregnant adolescents in the first trimester, and children with known or suspected cysticercosis (e.g., unexplained seizures) do not receive presumptive treatment with single dose Albendazole. Children <4 years and those with known or suspected cysticercosis (e.g., unexplained seizures) do not receive presumptive treatment with Praziquantel. Children <15 kg or measuring <90 cm and pregnant adolescents do not receive presumptive treatment with Ivermectin. (CDC Overseas Guidelines).

### *HIV and Sexually Transmitted Infections*

HIV/AIDS has not been commonly reported among recently arrived refugee children in the US, although data are limited [27]. However, extant data on HIV among adults from Iraq and the Thai–Burma border suggest that the prevalence of HIV among recently arrived children from these regions is relatively low [7, 28, 51]. As noted in Chap. 7, screening for HIV is recommended for all children after arrival in the US [52]. Subsequent to the reception and placement period, screening practices should be in accordance with guidelines for the general population, which recommend routine periodic HIV screening in all adolescents and risk-related screening for other STIs [53].

## Psychosocial Issues: Considerations for Children

Refugee children are typically exposed to a broad range of social and emotional stressors both prior to and during the resettlement period [54–56]. The prevalence of traumatic stress reactions and other forms of psychological distress vary considerably by prior exposure to adverse life events [57–59]. Although the best available estimate of the PTSD prevalence among refugee children resettled in Western countries is 11 % (7–17 %) [60], strong lines of evidence suggest that the prevalence of psychological distress differs greatly between different waves of refugee arrivals. Children who have been exposed to violent conflict and unaccompanied refugee minors may be at particularly high risk [54, 57, 58, 61].

Equally remarkable is that the majority of refugee children manifest good psychological adjustment. And while longitudinal data are limited, there is also evidence that the prevalence of distress decreases over time after arrival [59]. Additionally, even those with PTSD, generalized anxiety, somatization, traumatic grief, and generalized behavior problems may be at relatively low risk for engagement in substance abuse, criminal activity, or self-harm [61]. Stable resettlement, family cohesion, and access to social supports may be particularly important as protective factors [54, 62]. As might be expected, perceptions of broader social acceptance, as well as support from peers, are associated with self-esteem and improved psychological functioning. Acculturation is both difficult to define and to measure, but having some degree of alignment with both the host culture and with the child's original culture may be beneficial.

As described by Betancourt and Williams, treatment for children experiencing emotional distress or mental health problems may be conceptualized as psychosocial or psychiatric [63]. Psychosocial interventions are intended to help children get back to "normal" by restoring routines and building/rebuilding a child's social environment. Psychiatric approaches start by identifying children with mental disorders and delivering therapeutic interventions designed to address specific diagnoses.

Access to both psychosocial and psychiatric interventions is often challenging for refugee children. After resettlement, little about a child's setting may be familiar, and even family relationships may undergo changes. For example, parents may become increasingly dependent on their children, who often learn English more quickly, or relationships may shift when children are separated from or reunited with extended family members. Consequently, restoring routines and reconstituting a familiar social environment can be difficult, particularly when parents and caregivers are also under strain.

Accessing psychiatric interventions can be equally challenging. Families may be asked to complete screening intake questionnaires using standardized instruments that have not been translated or validated for a wide variety of languages or cultures [64]. Access to bicultural interpreters or counselors is often limited, and in small communities interpreters and patients may derive from the same social milieu. This may raise concerns about confidentiality or stigma. Increasingly, however, refugee resettlement agencies and primary care providers are collaborating with mental health providers in order to ensure that refugee children are able to access needed care.

At present, the evidence base for both psychosocial and psychiatric approaches is limited but growing. Approaches to mental health care for refugee children are typically based upon the broader evidence base for children's mental health treatment, with special attention to issues of language and culture [55, 56]. Empirically evaluated approaches that show promise among refugee children include school-based mental care and group-based interventions. Data are limited on family and expressive arts approaches. A thorough overview can be found in *Resilience & Recovery After War: Refugee Children and Families in the United States* [56].

## General Primary Care

The clinician must take care to address primary care issues as they would with any child. The periodic screenings performed by the primary care physician are of special importance to refugee children, as most often they have not had prior periodic screening. Key components include development, growth/nutrition, lead, and anemia. In infants, it may also include newborn screening for genetic and metabolic disorders.

Developmental screening is important to assess any motor or language delays, as well as any behavioral health issues, including but not limited to autism. Currently, commonly used tools in US, such as the Ages and Stages Questionnaire (ASQ), the Parents' Evaluation of Developmental Status (PEDS), and the Modified-Checklist for Autism in Toddlers (M-CHAT), have been validated in only few languages, e.g., English and Spanish. However, validation efforts for other national and ethnic groups are ongoing, and translations are often available in a wide variety of languages.[4,5,6] These include Arabic (M-CHAT; PEDS), French (ASQ-3, M-CHAT, PEDS), Somali (ASQ-PTI, M-CHAT, PEDS), and Vietnamese (M-CHAT, PEDS).

---

[4] http://www2.gsu.edu/~psydlr/Diana_L._Robins,_Ph.D.html.

[5] http://www.pedstest.com/Translations/PEDSinOtherLanguages.aspx.

[6] http://agesandstages.com/what-is-asq/languages/.

After the initial assessment of growth and nutrition mentioned previously, the primary care provider needs to continue to assess these on an ongoing basis. Children whose charts show wasting upon arrival need to be followed carefully for catch-up growth. For all children, weight gain also needs careful follow up to assure that it does not result in increasing BMI. After arrival in the US, children may adopt a high-calorie, low-nutrient diet as well as a more sedentary lifestyle.

Periodic lead and anemia screenings are also of great importance for refugee children. The prevalence of elevated blood lead levels (defined as >10 mcg/dL in existing studies[7]) ranges from <2 % among children from Iraq to >20 % among children from sub-Saharan Africa [28, 65], with intermediate levels (5 %) observed among children from Burma [66, 67]. A study of refugee children under 7 years of age arriving to Massachusetts between 2000 and 2007 demonstrated that 16 % had elevated lead levels, as compared to 1.4 % of US children between 1995 and 1999 [65]. Using the more recent cut point of 5 mcg/dL [Ref: http://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf], one study from the Thai–Burma border found that 73 % of children had elevated blood lead levels. Sources of environmental lead exposure that may be unique to refugee children include lead-alloy cookware, car batteries used as household generators, and contaminated foods, cosmetics, or traditional medications.

Because children of all ages may be exposed to contaminated products, laboratory screening is recommended for all newly arrived refugee children and adolescents (6 months to 16 years). In urban areas with older housing stock, children may also be exposed to environmental lead after arrival in the US [65, 68]. For this reason, repeated screening is recommended for all children <6 years between 3 and 6 months after arrival [69]. Additionally, children <6 years should receive an age-appropriate multivitamin with iron, as individuals with malnutrition and micronutrient deficiencies are at increased risk for lead poisoning.

The treatment of elevated blood lead levels focuses on removing the source of lead contamination and, in severe cases, chelation and decontamination. Although blood lead levels <10 mcg/dL may impair neurodevelopment [70], acute symptoms are typically present only with levels of 45 mcg/dL or higher. These include headache, abdominal pain, constipation, and neurologic impairment, such as clumsiness or lethargy. Severe acute neurologic effects include ataxia, seizures, coma, and death. Detailed management of elevated blood lead levels is beyond the scope of this chapter, but should be consistent with established guidelines (www.cdc.gov/lead/scientificandeducation.htm; www.cdc.gov/nceh/lead). Educational materials in different languages are available from many state and local childhood lead poisoning prevention programs, including Minnesota (http://www.health.state.mn.us/divs/eh/lead/fs/) and Philadelphia (http://www.phila.gov/health/childhoodlead/EducationOutreach.html), as well as refugee-serving organizations (http://www.refugees.org/resources/for-refugees--immigrants/health/healthy-living-toolkit/).

[7] The majority of publications on elevated blood lead levels among refugee children predate the CDC's decision to revise the blood lead level reference value to 5 mcg/dL.

Anemia is also variable among refugee children in the US, affecting 4–43 % of newly arrived children, with significant variability between age groups and regions of origin [4, 27, 28, 65, 68, 71, 72]. Recent data offer limited detail but suggest that the overall prevalence of anemia is 10–20 % among children arriving in the US and may be higher among children from Bhutan and Burma than those from Iraq [28, 65]. Prior population-based studies from refugee camps in Nepal suggest that anemia is more common among infants than older children and, among adolescents, more common among females than males [6, 73, 74].

Causes of anemia include micronutrient deficiencies, for example iron or vitamin B12, and hereditary forms of anemia, such as G6PD deficiency, thalassemia, and sickle cell anemia. Unlike children born in the US, refugee children have not undergone newborn screening, and they may have limited information about their family's medical history. As a result, hereditary anemias may be diagnosed at a later age than might be typical for other primary care patients. Children at risk for hereditary anemias include those from the Middle East (thalassemia, G6PD deficiency, rarely sickle cell anemia) [75, 76]; Burma and other regions of South and South East Asia (thalassemia) [77], and sub-Saharan Africa (G6PD deficiency, thalassemia, sickle cell anemia). For each of these diseases, the prevalence rates differ by population but may be as high as 20 %. As a result, clinicians should have a high index of suspicion for hereditary etiologies when evaluating anemic children from these regions.

Refugee children, like other immigrant children, are especially at risk for dental problems, particularly caries [4, 46, 72, 78]. In a detailed examination of oral health for children who resettled in Massachusetts in 2002, caries were notably common among all refugees, however prevalence varied by region of origin. For example, children from Africa (predominantly Somalia, Liberia, and Sudan) were least likely to have any caries. Nonetheless, one in three African children was affected and 1 in 20 required urgent dental care. Caries were significantly more common (88 %) among children from Europe (predominantly Bosnia), the largest comparator group [78].

Primary care providers should survey a refugee child's teeth as part of routine health surveillance and refer any acute dental issues immediately. They may also apply dental varnish if available, and review the basics of dental hygiene. Most importantly, they should refer all refugee children to a primary pediatric dentist for routine dental care as soon as possible after arrival in the US.

In addition to managing primary care conditions, clinicians for recently resettled children must simultaneously strive to provide linguistically and culturally appropriate care. This is of particular importance when treating adolescents, as some aspects of adolescent health care in the US are not routine components of the patient–doctor relationship in many other regions of the world. Adolescents and their parents often do not expect the physician to complete a breast or genital exam or to ask questions about social functioning, substance use, or sexual and reproductive health. Orienting adolescents and their parents beforehand can help to normalize these experiences, as may giving adolescents the option of having a gender concordant provider.

Similarly, clinicians may collaborate with community leaders and other experts to develop anticipatory guidance that is consistent with a refugee community's frame of reference, opportunities, and expectations (i.e., culturally relevant), as well as parents' literacy level. For example, dietary guidance may be most effective when based upon foods that are both familiar to families and accessible in the US and can often build upon parents' existing beliefs regarding healthy and unhealthy nutritional practices. In contrast, anticipatory guidance regarding home safety, e.g., use of smoke and carbon monoxide detectors, may require that clinicians introduce an entirely new set of concepts and objects for families who have come from refugee camps or agrarian regions with limited access to electricity. Similarly, families with low literacy levels may require visual aids, such as pictograms or marked syringes, to safely administer medication to their children, while those with very high literacy levels may prefer written or even online information in their preferred language.

In general, approaches characterized by cultural humility, defined by Tervalon and Murray-Garcia [79] as a long-term process of engagement and reflection with the intention of learning to work respectfully and effectively with patients from different cultural groups, can help clinicians develop strong therapeutic relationships with children and families. Working with families in this way is a unique learning experience for the provider and a critical point of engagement for children and families who may be intimidated or overwhelmed by the complexity of the US health system. Primary care providers, who are often a child's first point of contact with US health care, play an indispensible and often formative role in determining how children will experience all subsequent care.

## References

1. Department of Homeland Security. Yearbook of immigration statistics: Table 15. Washington, DC: Department of Homeland Security; 2005–2011.
2. Department of Homeland Security. Yearbook of immigration statistics: Table 14d. Washington, DC: Department of Homeland Security; 2011.
3. Unaccompanied Refugee Minors (URM). Washington, DC. http://www.acf.hhs.gov/programs/orr/programs/urm, 2013.
4. Geltman PL, Radin M, Zhang Z, et al. Growth status and related medical conditions among refugee children in Massachusetts, 1995–1998. Am J Publ Health. 2001;91:1800–5.
5. Seal AJ, Creeke PI, Mirghani Z, et al. Iron and vitamin A deficiency in long-term African refugees. J Nutr. 2005;135:808–13.
6. CDC. Malnutrition and micronutrient deficiencies among Bhutanese refugee children—Nepal, 2007. MMWR. 2008;57:370–3.
7. Yanni EA, Naoum M, Odeh N, et al. The Health profile and chronic diseases comorbidities of US-bound Iraqi refugees screened by the International Organization for Migration in Jordan: 2007–2009. J Immigr Minor Health. 2013;15:1–9. doi:10.1007/s10903-012-9578-6.
8. AaM S-B, Wiegersma PA, Bijleveld CM, et al. Obesity in asylum seekers' children in The Netherlands–the use of national reference charts. Eur J Publ Health. 2007;17:555–9. doi:10.1093/eurpub/ckm013.
9. Hjern A. Health and nutrition in newly resettled refugee children from Chile and the Middle East. Acta Paediatr Scand. 1991;80:859–67.

10. Banjong O, Menefee A, Sranacharoenpong K, et al. Dietary assessment of refugees living in camps: a case study of Mae La Camp, Thailand. Food Nutr Bull. 2003;24:360–7.
11. Kemmer T, Bovill M. Iron deficiency is unacceptably high in refugee children from Burma. J Nutr. 2003;133:4143–9.
12. Penrose K, Hunter Adams J, Nguyen T, et al. Vitamin d deficiency among newly resettled refugees in massachusetts. J Immigr Minor Health. 2012;14:941–8. doi:10.1007/s10903-012-9603-9.
13. Blanck HM, Ba B, Serdula MK, et al. Angular stomatitis and riboflavin status among adolescent Bhutanese refugees living in southeastern Nepal. Am J Clin Nutr. 2002;76:430–5.
14. CDC. Vitamin B12 deficiency in resettled Bhutanese refugees – United States, 2008–2011. MMWR. 2011;60:343–6.
15. WHO. Physical status: the use and interpretatio of anthropometry – infants and children. Geneva: WHO; 1995.
16. Doyle J. Nutritional vitamin B12 deficiency in infancy: three case reports and a review of the literature. Pediatr Hematol Oncol. 1989;6:161–72.
17. Guez S, Chiarelli G, Menni F, et al. Severe vitamin B12 deficiency in an exclusively breastfed 5-month-old Italian infant born to a mother receiving multivitamin supplementation during pregnancy. BMC Pediatr. 2012;12:85.
18. Kühne T, Bubl R, Baumgartner R. Maternal vegan diet causing a serious infantile neurological disorder due to vitamin B 12 deficiency. Eur J Pediatr. 1991;150:205–8.
19. Benson J, Maldari T, Turnbull T. Vitamin B12 deficiency: why refugee patients are at high risk. Aust Fam Physician. 2010;39:215–7.
20. Kaptan K, Beyan C, Ural A, et al. Helicobacter pylori–is it a novel causative agent in Vitamin B12 deficiency? Arch Intern Med. 2000;160:1349–535.
21. Taylor-Robinson D, Maayan N, Soares-Weiser K, et al. Deworming drugs for soil-transmitted intestinal worms in children: effects on nutritional indicators, haemoglobin and school performance (review). The Cochrane Collaborative. 2012.
22. de Onis M, Garza C, Onyango AW, et al. Comparison of the WHO child growth standards and the CDC 2000 growth charts. J Nutr. 2007;137:144–8.
23. Butte NF, Garza C, de Onis M. Evaluation of the feasibility of international growth standards for school-aged children and adolescents. J Nutr. 2007;137:153–7.
24. Haas J, Campirano F. Interpopulation variation in height among children 7 to 18 years of age. Food Nutr Bull. 2006;27:s212–23.
25. Lifson AR, Thai D, O'Fallon A, et al. Prevalence of tuberculosis, hepatitis B virus, and intestinal parasitic infections among refugees to Minnesota. Public Health Rep. 2002;117:69–77.
26. Sheikh M, Pal A, Wang S, et al. The epidemiology of health conditions of newly arrived refugee children: a review of patients attending a specialist health clinic in Sydney. J Paediatr Child Health. 2009;45:509–13. doi:10.1111/j.1440-1754.2009.01550.x.
27. Watts D-J, Friedman JF, Vivier PM, et al. Health care utilization of refugee children after resettlement. J Immigr Minor Health. 2012;14:583–8. doi:10.1007/s10903-011-9530-1.
28. Ramos M, Orozovich P, Moser K, et al. Health of resettled Iraqi refugees—San Diego County, California, October 2007–September 2009. Morb Mortal Wkly Rep. 2011;59:1614–8.
29. WHO. Global Tuberculosis report. Geneva: WHO; 2012.
30. Bam TS, Da E, Hinderaker SG, et al. High success rate of TB treatment among Bhutanese refugees in Nepal. Int J Tubercul Lung Dis. 2007;11:54–8.
31. Minetti A, Camelique O, Hsa Thaw K, et al. Tuberculosis treatment in a refugee and migrant population: 20 years of experience on the Thai–Burmese border. Int J Tubercul Lung Dis. 2010;14:1589–95.
32. CDC. Technical instructions for tuberculosis screening and treatment. Atlanta: Division of Global Migration and Quarantine; 2009.
33. CDC. Tuberculosis screening and treatment technical instructions using cultures and directly observed therapy implementation. Atlanta: Division of Global Migration and Quarantine; 2012.

34. CDC. Updated guidelines for using interferon gamma release assays to detect mycobacterium tuberculosis infection – United States, 2010. MMWR. 2010; 59:1–26.
35. CDC. Guidelines for screening for tuberculosis infection and disease during the domestic medical examination for newly arrived refugees. Atlanta: Division of Global Migration and Quarantine; 2012.
36. Carey J, Oxtoby M, Nguyen L, et al. Tuberculosis beliefs among recent Vietnamese refugees in New York State. Public Health Rep. 1997;112:66–72.
37. Sheikh M, MacIntyre CR. The impact of intensive health promotion to a targeted refugee population on utilisation of a new refugee paediatric clinic at the children's hospital at Westmead. Ethn Health. 2009;14:393–405. doi:10.1080/13557850802653780.
38. Wieland ML, Ja W, Yawn BP, et al. Perceptions of tuberculosis among immigrants and refugees at an adult education center: a community-based participatory research approach. J Immigr Minor Health. 2012;14:14–22. doi:10.1007/s10903-010-9391-z.
39. Geltman PL, Cochran J, Hedgecock C. Intestinal parasites among African refugees resettled in Massachusetts and the impact of an overseas pre-departure treatment program. Am J Trop Med Hyg. 2003;69:657–62.
40. Swanson SJ, Phares CR, Mamo B, et al. Albendazole therapy and enteric parasites in United States-bound refugees. N Engl J Med. 2012;366:1498–507. doi:10.1056/NEJMoa1103360.
41. CDC. Refugee health guidelines: intestinal parasites overseas recommendations. Atlanta, GA: Division of Global Migration and Quarantine; 2013.
42. Phares CR, Kapella BK, Doney AC, et al. Presumptive treatment to reduce imported malaria among refugees from east Africa resettling in the United States. AmJTrop Med Hyg. 2011;85:612–5.
43. WHO. World malaria report. Geneva: WHO; 2012.
44. Dawson-Hahn EE, Greenberg SLM, Domachowske JB, et al. Eosinophilia and the seroprevalence of schistosomiasis and strongyloidiasis in newly arrived pediatric refugees: an examination of Centers for Disease Control and Prevention screening guidelines. J Pediatr. 2010;156:1016–8. doi:10.1016/j.jpeds.2010.02.043.
45. Olsen A, van Lieshout L, Marti H, et al. Strongyloidiasis–the most neglected of the neglected tropical diseases? Trans R Soc Trop Med Hyg. 2009;103:967–72. doi:10.1016/j.trstmh.2009.02.013.
46. Meropol SB. Health status of pediatric refugees in Buffalo, NY. Arch Pediatr Adolesc Med. 1995;149:887–92.
47. Paxton GA, Sangster KJ, Maxwell EL, et al. Post-arrival health screening in Karen refugees in Australia. PloS One. 2012;7:e38194.
48. Hurie M, Mast E, Davis J. Horizontal transmission of hepatitis B virus infection to United States-born children of Hmong refugees. Pediatrics. 1992;89:269–74.
49. CDC, editor. Evaluating and updating immunizations during the domestic medical examination for newly arrived refugees. Atlanta: Division of Global Migration and Quarantine; 2012
50. Greenaway C, Wong DKH, Assayag D, et al. Screening for hepatitis C infection: evidence review for newly arriving immigrants and refugees. Can J Med. 2011. doi:10.1503/cmaj.090313.
51. Plewes K, Lee T, Kajeechewa L, et al. Low seroprevalence of HIV and syphilis in pregnant women in refugee camps on the Thai-Burma border. Int J STD & AIDS. 2008;19:833–7. doi:10.1258/ijsa.2008.008034.
52. CDC. Screening for sexually transmitted diseases during the domestic medical examination for newly arrived refugees. Atlanta: Division of Global Migration and Quarantine; 2012.
53. CDC. STD treatment guidelines. Atlanta: Division of STD Prevention; 2010.
54. Fazel M, Reed RV, Panter-Brick C, et al. Mental health of displaced and refugee children resettled in high-income countries: risk and protective factors. Lancet. 2012;379:266–82. doi:10.1016/S0140-6736(11)60051-2.

55. Lustig S, Kia-Keating M, Knight W, et al. Review of child and adolescent refugee mental health. J Am Acad Child Adolesc Psychiatr. 2004;43:24–36. doi:10.1097/01.chi.0000096619.64367.37.
56. APA. Resilience & recovery after war: refugee children and families in the United States: task force on the psychosocial effects of war on children and families who are refugees from armed conflict residing in the United States. Washington DC: APA; 2010.
57. Bean T, Derluyn I, Eurelings-Bontekoe E, et al. Comparing psychological distress, traumatic stress reactions, and experiences of unaccompanied refugee minors with experiences of adolescents accompanied by parents. J Nerv Ment Dis. 2007;195:288–97. doi:10.1097/01.nmd.0000243751.49499.93.
58. Bean TM, Eurelings-Bontekoe E, Spinhoven P. Course and predictors of mental health of unaccompanied refugee minors in the Netherlands: one year follow-up. Soc Sci Med. 2007;64:1204–15. doi:10.1016/j.socscimed.2006.11.010.
59. Montgomery E. Trauma and resilience in young refugees: a 9-year follow-up study. Dev Psychopathol. 2010;22:477–89. doi:10.1017/S0954579410000180.
60. Fazel M, Wheeler J, Danesh J. Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. Lancet. 2005;365:1309–14. doi:10.1016/S0140-6736(05)61027-6.
61. Betancourt TS, Newnham EA, Layne CM, et al. Trauma history and psychopathology in war-affected refugee children referred for trauma-related mental health services in the United States. J Trauma Stress. 2012;25:682–90.
62. Porter M, Haslam N. Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: a meta-analysis. JAMA. 2005;294:602–12. doi:10.1001/jama.294.5.602.
63. Betancourt T, Williams T. Building an evidence base on mental health interventions for children affected by armed conflict. Intervention (Amstelveen). 2008;6:1–15. doi:10.1097/WTF.0b013e3282f761ff.Building.
64. Davidson G, Murray KE, Schweitzer RD. Review of refugee mental health assessment: best practices and recommendations. J Pacific Rim Psychol. 2010;4:72–85.
65. Eisenberg KW, van Wijngaarden E, Fisher SG, et al. Blood lead levels of refugee children resettled in Massachusetts, 2000 to 2007. A J Pubic Health. 2011;101:48–54. doi:10.2105/AJPH.2009.184408.
66. Mitchell T, Jentes E, Ortega L, et al. Lead poisoning in United States-bound refugee children: Thailand–Burma border, 2009. Pediatrics. 2012;129:e392–9.
67. Power D, Moody E, Trussell K, et al. Caring for the Karen: a newly arrived refugee group. Minn Med. 2010;93(4):49–53.
68. Geltman P, Brown M, Cochran J. Lead poisoning among refugee children resettled in Massachusetts, 1995 to 1999. Pediatrics. 2001;108:158–62. doi:10.1542/peds.108.1.158.
69. CDC. Lead screening during the domestic medical examination for newly arrived refugees. Atlanta: Division of Global Migration and Quarantine; 2012.
70. Canfield RL, Henderson CR, Cory-Slechta DA, et al. Intellectual impairment in children with blood lead concentrations below 10 mcg per deciliter. N Engl J Med. 2003;348:1517–26.
71. Entzel PP, Fleming LE, Trepka MJ, et al. The health status of newly arrived refugee children in Miami – Dade county, Florida. Am J Public Health. 2003;93:286–8.
72. Hayes E, Talbot S. Health status of pediatric refugees in Portland, ME. Arch Pediatr. 1998;152:564–8.
73. Bilukha O, Howard C, Wilkinson C, et al. Effects of multimicronutrient home fortification on anemia and growth in Bhutanese refugee children. Food Nutr Bull. 2011;32:264–76.
74. CDC. Nutritional assessment of adolescent refugees – Nepal 1999. Morbid Mortal Wkly Rep. 2000;49(38):864–7.
75. Hamamy HA. Genetic diseases in Iraq. In: Teebi AS, editor. Genetic disorders among Arab populations. 2nd ed. New York: Springer; 2010. p. 297–323.

76. Nkhoma ET, Poole C, Vannappagari V, et al. The global prevalence of glucose-6-phosphate dehydrogenase deficiency: a systematic review and meta-analysis. Blood Cells Mol Dis. 2009;42:267–78. doi:10.1016/j.bcmd.2008.12.005.
77. Fucharoen S, Winichagoon P. Haemoglobinopathies in Southeast Asia. Indian J Med Res. 2011;134:498–506.
78. Cote S, Geltman P, Nunn M, et al. Dental caries of refugee children compared with US children. Pediatrics. 2004;114:e733–40. doi:10.1542/peds.2004-0496.
79. Tervalon M, Murray-Garcia J. Cultural humility versus cultural competence: a critical distinction in defining physician training outcomes in multicultural education. J Health Care Poor Underserved. 1998;9:117–25.
80. Khatib IM, Samrah SM, Zghol FM. Nutritional interventions in refugee camps on Jordan's eastern border: assessment of status of vulnerable groups. East Mediterr Health J. 2010 Feb;16(2):187-93.
81. Rice AL, West KP Jr, Black RE. Vitamin A deficiency. In: Ezzati M, Lopez AD, Rogers A, Murray CJL, editors. Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors (Volume 1). Geneva: World Health Organization; 2004.
82. Caulfield LE, Black RE. Zinc deficiency. In: Ezzati M LA, Rogers A, Murray CJL (ed). Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. Volume 1. Geneva: World Health Organization, 2004:257-79.