Prevalence of Tuberculosis, Hepatitis B Virus, and Intestinal Parasitic Infections Among Refugees to Minnesota

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SYNOPSIS

Objective. The purpose of this study was to define the prevalence of infection with *Mycobacterium tuberculosis*, hepatitis B virus, and various intestinal parasites among different groups of primary refugees immigrating to Minnesota.

Methods. 2,545 refugees arriving in Minnesota during 1999 received a domestic health examination that included tuberculin skin testing, hepatitis B virus serologic testing, and stool ova and parasite examinations. The Refugee Health Assessment form asked specifically about screening results for amebiasis, ascariasis, clonorchiasis, giardiasis, hookworm, schistosomiasis, strongyloidiasis, and trichuriasis.

Results. Forty-nine percent of refugees had a reactive tuberculin test of ≥10 mm induration, with a higher prevalence in males (54%) and refugees ≥18 years of age (63%) ($p<0.001$). Seven percent had a positive hepatitis B surface antigen, with the highest prevalence in those people from sub-Saharan Africa (8%) ($p=0.002$) and those refugees ≥18 years of age (9%) ($p=0.006$). Twenty-two percent had one or more intestinal parasites asked about, including 30% of those refugees <18 years of age ($p<0.001$). The most commonly reported parasitic infections were trichuriasis (8%) and giardiasis (7%).

Conclusions. Evidence of infection with *M. tuberculosis*, hepatitis B virus, or one of eight intestinal parasites was present in a substantial proportion of refugees receiving the domestic health assessment. Screening for such infections gives new immigrants the opportunity to receive important medical evaluation and treatment, provides valuable surveillance data, and allows appropriate public health measures to be taken.

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INTRODUCTION

Between 1975 and 2000, more than two million refugees came to the United States from other countries where they suffered or feared persecution.[1] Many of the countries these individuals emigrated from have high rates of tuberculosis (TB), hepatitis B virus infection, and various parasitic infections.[2,3] The risk of these and other infections is exacerbated by the harsh or chaotic living conditions many refugees experience before emmigration, including crowded refugee camps and war-torn areas in which basic health services have collapsed.

Before departure, refugees must receive an overseas medical examination to identify medical conditions that would prohibit entry into the U.S. This examination includes an evaluation for defined communicable diseases of public health significance, including infectious pulmonary TB, HIV, syphilis, other sexually transmitted diseases, and leprosy.[3,4] Other excludable conditions include physical or mental disorders associated with harmful behavior and drug abuse.[3,4]

Evaluation for infectious pulmonary TB includes a chest radiograph for those refugees ≥15 years of age. Refugees who have radiographs consistent with active pulmonary TB must have three follow-up sputum smear examinations for acid-fast bacilli.[4] Class A TB, an excludable condition, is defined by an abnormal chest radiograph suggesting active pulmonary TB, with a positive sputum smear. Class B1 TB is defined by an abnormal chest radiograph suggesting active pulmonary TB with negative sputum smears, or by extrapulmonary TB. Class B2 TB is defined by an abnormal chest radiograph suggesting pulmonary TB that is not clinically active. Class B3 TB patients have abnormal radiographs with only a calcified hilar lymph node, a calcified primary complex, or a calcified granuloma. Refugees <15 years of age are required to have a tuberculin skin test if they are suspected of having TB or have a history of contact with a known person with TB; chest radiographs are required for refugees <15 years of age whose tuberculin skin test is positive.[4]

After arrival in the U.S., all refugees are requested to have a domestic health assessment within 90 days of resettlement. Screening tests recommended by the Minnesota Department of Health (MDH) as part of this assessment include a tuberculin skin test, serologic testing for hepatitis B virus, and stool examination for intestinal parasites.[5,6] Refugees with a reactive tuberculin test are evaluated for active TB, and, if negative, may be candidates for treatment of latent TB infection to help prevent subsequent TB disease due to reactivation.[7] Current guidelines recommend that infected people considered to be at high risk for developing active TB should be offered treatment of latent TB infection irrespective of age.[7] People with current hepatitis B virus infection require medical evaluation and counseling about ways to reduce transmission of hepatitis B virus to others.[8] Close contacts of those people infected with hepatitis B virus (including household contacts and sex partners) are candidates for hepatitis B vaccine to help prevent additional infections; for infants born to infected women, hepatitis B vaccine and immune globulin are needed to help prevent perinatal transmission.[9] Treatment of intestinal parasites benefits both the health of the individual refugee and prevents potential spread to others. Refugee screening results alert health care providers to problems they may expect in other new arrivals, and help public health officials develop and evaluate communicable disease control strategies.

Data from the Minnesota Refugee Health Assessment Form are routinely summarized and evaluated by the MDH as part of the Refugee Health Program's public health surveillance function.[5,6] To help determine the prevalence of infection with *Mycobacterium tuberculosis*, hepatitis B virus, or intestinal parasites among these new refugees, we evaluated data reported to the MDH on 2,545 primary refugees arriving in Minnesota during 1999 from all over the world. We defined primary refugees as refugees whose primary state of resettlement after arriving in the U.S. was Minnesota.

METHODS

MDH is the single point of notification for the pending arrival of new refugees to Minnesota. MDH receives arrival forms from quarantine stations at the various points of entry that are operated by the Centers for Disease Control and Prevention. MDH sends these forms along with a Refugee Health Assessment Form and personal immunization record card to the local public health agency in the county where the refugee plans to resettle. The local agency then arranges for the health assessment, or forwards the packet to the primary medical provider or clinic conducting the screening. The provider or clinic returns the completed form to MDH, which reports summary screening results on a regular basis to the federal Office of Refugee Resettlement.

The domestic refugee health assessment recommended by the MDH includes a Mantoux tuberculin skin test, regardless of bacille Calmette-Guérin vaccination history, unless medically contraindicated. MDH

recommends a chest radiograph for refugees with a positive tuberculin skin test, refugees arriving with Class A or Class B TB conditions, and refugees with symptoms suggesting TB disease. Recommended serologic screening for hepatitis B virus infection includes testing for hepatitis B surface antigen (HBsAg), hepatitis B core antibody (HBcAb), and hepatitis B surface antibody (HBsAb). A variety of sensitive and specific tests for serologic detection of hepatitis B virus antigen and antibody are available, including those based on enzyme immunoassay;[10] different laboratories may use different commercial kits. MDH recommends that screening for intestinal parasites include examination of three stool specimens obtained more than 24 hours apart. Serologic screening for hepatitis B virus, as well as screening for intestinal ova and parasites, may be performed at various laboratories associated with particular clinics or providers. None of these tests is included routinely in the overseas examination.

The standardized Minnesota Initial Refugee Health Assessment data collection form includes demographic information, as well as dates of arrival and screening. This form also asks about induration size in response to the Mantoux tuberculin test; results of a chest radiograph taken in the U.S. (if done); results of testing for HBsAb, HBcAb, and HBsAg; and results of stool ova and parasite examinations for amebiasis, ascariasis, clonorchiasis, giardiasis, hookworm, schistosomiasis, strongyloidiasis, and trichuriasis. The form also includes health questions about immunization status and pregnancy; results of testing for eosinophilia and anemia; and, if performed, the results of screening for sexually transmitted diseases and malaria. Brief guidelines for performing the major screening tests and recommendations about other health issues to consider in refugee evaluation have been summarized in newsletters from the MDH[5,6] and on the Minnesota Refugee Health Assessment Form.

Public health clinic staff performed domestic health assessments in the three Minnesota counties with the largest number of refugees (Hennepin, Ramsey, and Olmsted); these counties accounted for 84% of all refugee assessments in 1999 (unpublished data, MDH). In the remaining counties, refugees are typically referred to private providers or clinics for evaluation. Providers performing the domestic health assessment may conduct short-term follow-up of some clinical conditions identified during the initial screening, such as treatment of intestinal parasites. If longer-term evaluation or more extensive treatment is required (e.g., for patients with chronic liver disease), referral may be made to primary or other health care services.

In this analysis, the Minnesota Initial Refugee Health Assessment Forms returned to the MDH for primary refugees during 1999 were evaluated for Class A or B TB conditions, results of tuberculin skin testing, hepatitis B virus serologies, and results of stool examination for the eight parasitic infections listed previously. Proportions of refugees with a positive test for these infections were compared by sex, age group, and geographic region of origin using the chi-square test.

RESULTS

Study population

During 1999, 3,914 primary refugees immigrated to Minnesota directly from other countries; 2,545 (65%) of them had the Minnesota Initial Refugee Health Assessment Forms returned to the MDH. Refugees who did and did not have completed forms returned did not differ significantly by gender or age group ($p>0.10$), although those refugees with completed and returned forms were more likely to be from Eastern Europe (70%) than sub-Saharan Africa (64%) or Southeast Asia (60%) ($p=0.003$). Of the refugees who had forms returned, the median time between arrival in the United States and medical evaluation was 67 days; 69% of all screenings were performed within 90 days of arrival, and 85% of all screenings were performed within 120 days.

Of 2,545 refugees with completed forms, 47% were female. The mean age upon arrival was 23 years; 11% were ≤6 years, 35% were 7–17 years, 46% were 18–50 years, and 9% were ≥51 years of age. Seventy-three percent were from sub-Saharan Africa, 23% from Eastern Europe, 3% from Southeast Asia, and <1% from other regions of the world. The largest numbers of refugees were from Somalia (828), Ethiopia (567), Liberia (352), or Bosnia/Herzegovina (333).

Tuberculosis

No refugee had a Class A TB condition upon arrival, and 120 refugees (5%) were Class B (12 Class B1, 88 Class B2, and 20 Class B3). Of 2,425 refugees without TB class conditions, 2,249 (93%) had tuberculin skin test results reported; 1,048 (47%) had a response of <5 mm induration, 142 (6%) a response of 5–9 mm, and 1,059 (47%) a response of ≥10 mm induration. One hundred six (88%) refugees with Class B TB conditions received a tuberculin skin test; 18 (17%) had a response of <5 mm induration, 2 (2%) a response of 5–9 mm, and 86 (81%) a response of ≥10 mm. Therefore, of 2,355 refugees who received a tuberculin skin test, 1,145 (49%) had a positive response, defined for this analysis as ≥10 mm induration. The prevalence of positive skin test responses

differed significantly by gender ($p<0.001$), age group ($p<0.001$), and geographic region of origin ($p=0.007$). (See Table.)

The prevalence of positive skin test responses was higher in men and adults; 63% of refugees ≥18 years of age had a positive tuberculin skin test compared with 32% of those refugees <18 years ($p<0.001$). Of countries from which at least 40 refugees were evaluated, the prevalence of a skin test defined as positive was highest in refugees from Ethiopia (57%), Vietnam (54%), Somalia (52%), Bosnia/Herzegovina (47%), Ukraine (46%), and Liberia (42%).

Follow-up chest radiographs were reported for 940 refugees with tuberculin skin tests defined as positive (≥10 mm induration) who did not have a TB Class condition upon arrival. Thirteen (1%) had radiographs suggesting possible active TB. Twelve of these refugees were ≥16 years of age, and one was 14 years of age—below the age when routine chest radiographs are required for immigration.[4] (Note: this individual's chest radiograph was consistent with cavitary disease.) For nine of the 13 patients with abnormal chest radiographs, the Refugee Health Assessment Form noted that the patient had received or was receiving treatment for active TB. For the remaining four patients, receipt of treatment for active TB was not recorded; these included patients referred to other providers or for whom additional evaluation was pending.

Hepatitis B infection

Of 2,353 refugees tested for HBsAg, 174 (7%) had a positive test result. The proportion with a positive HBsAg test differed significantly by gender ($p=0.006$), age group ($p=0.008$), and geographic region of origin ($p=0.002$) (see Table). The prevalence of a positive HBsAg was higher in males, those refugees from sub-Saharan Africa, and adults; 9% of refugees ≥18 years of age had a positive HBsAg test, compared with 6% of those refugees <18 years of age ($p=0.006$). Of those countries with at least 40 refugees evaluated, the prevalence of a positive HBsAg test was highest in those from Liberia (15%) and Sudan (10%).

Of those refugees who were HBsAg-negative, 2,124 were tested for HBsAb and 444 for HBcAb; some refugees were tested for only one antibody and some for both. A positive result occurred in 779 refugees (37%) tested for HBsAb and in 162 refugees (36%) tested for HBcAb. Of 432 HbsAg-negative refugees tested for both HBsAb and HBcAb, 232 (54%) were negative on both tests; 125 (29%) were positive on both; 44 (10%) were only HBsAb-positive; and 31 (7%) were HBcAb-positive only.

Intestinal parasitic infections

Of 2,129 (84%) refugees with results of stool ova and parasite examinations, 179 (8%) were reported with trichuriasis, 139 (7%) with giardiasis, 74 (3%) with

Table. Refugee Health Assessment Form results for tuberculin skin testing, hepatitis B virus screening, and stool parasitic examination for primary refugees to Minnesota during 1999 (*N* = 2,545)[a]

	Total number	*Positive (≥10 mm) tuberculin skin test* Percent	*Positive hepatitis B surface antigen* Percent	*Parasitic infection*[b] Percent
Gender				
Female	1,184	42.9	5.8	19.8
Male	1,360	53.7	8.8	23.4
Age group				
0–6 years	280	13.7	2.9	24.3
7–17 years	886	37.6	6.6	31.3
18–50 years	1,161	62.3	9.0	15.5
≥51 years	218	63.6	7.4	13.8
Geographic region of origin				
Eastern Europe	585	42.8	4.4	9.7
Southeast Asia	83	51.3	2.9	29.5
Sub-Saharan Africa	1,869	50.5	8.5	25.1

[a]Missing data excluded from analysis.

[b]Detection of one or more of the following intestinal parasitic infections on stool examination: amebiasis, ascariasis, clonorchiasis, giardiasis, hoodworm, schistosomiasis, strongyloidiasis, or trichuriasis

schistosomiasis, 63 (3%) with hookworm, 37 (2%) with amebiasis, 30 (1%) with ascariasis, 17 (1%) with strongyloidiasis, and 0 (0%) with clonorchiasis. In total, 462 (22%) refugees were reported with one or more of these parasitic infections. The prevalence of infection with one or more of these eight parasites varied by gender (p=0.046), age group (p<0.001), and geographic region of origin (p<0.001) (see Table). The prevalence was higher in males, and in children or adolescents; 30% of refugees <18 years of age had a positive test for one or more of these eight parasites, compared with 15% of refugees ≥18 years (p<0.001). Of countries with at least 40 refugees evaluated, the prevalence of infection with one or more of these parasites was highest in those from Sudan (33%), Liberia (27%), Somalia (26%), Vietnam (23%), and Ethiopia (23%).

DISCUSSION

The Office of Refugee Resettlement, the Office of Refugee Health, and the Centers for Disease Control and Prevention have developed a medical screening protocol for newly arrived refugees, to be used by state refugee health coordinators.[11] Data from this study support the importance of making screening for infection with TB, hepatitis B, and intestinal parasites a routine part of a state's refugee health assessment. Of primary refugees immigrating to Minnesota during 1999 who received the domestic refugee health assessment, 49% had a tuberculin skin test considered positive, 7% had a positive test for HBsAg, and 22% had a positive stool examination for one or more of eight intestinal parasites.

The high proportion of refugees with a positive tuberculin skin test is consistent with other studies. Of refugees tested throughout the U.S. from mid-1993 through mid-1995, 43% were tuberculin skin test-positive.[3] A positive tuberculin skin test has been reported in a high proportion of refugees from specific countries in Southeast Asia, Africa, and Eastern Europe—including Vietnam, Ethiopia, Somalia, and Bosnia[3,12,13]—compatible with our data.

The high rate of *M. tuberculosis* infection in refugees also is consistent with the growing proportion of U.S. cases of active TB in foreign-born people. In 1999, 43% of all TB cases reported in the U.S. were in foreign-born people, compared with 24% in 1990.[14] In Minnesota, 78% of the active TB cases in 1999 were in foreign-born individuals, compared with 50% in 1995.[15] Despite the importance of the overseas examination evaluating immigrants for active, infectious pulmonary TB, this examination has limitations. It is possible for an individual to develop active TB after obtaining a chest x-ray and before emigration. The overseas examination fails to identify people with active extrapulmonary TB not evident on a chest radiograph. This examination does not routinely include a tuberculin skin test to identify those people with latent *M. tuberculosis* infection, which is responsible for many subsequent cases of TB among foreign-born individuals in the United States.[16] In Minnesota, of 156 active cases of TB in foreign-born people reported during 1999, none arrived with Class A TB conditions, and only 12 (8%) arrived with Class B TB conditions (unpublished data, MDH). However, 46% of active cases of TB in foreign-born people in Minnesota were diagnosed within 12 months of arriving in the United States, and an additional 26% were diagnosed within one to five years after arrival. Tuberculin skin testing is therefore essential for all newly arrived foreign-born people, with appropriate follow-up and treatment according to established guidelines.[7] The Institute of Medicine recently recommended that tuberculin skin testing be required as part of the medical evaluation for immigrant visa applicants from countries with high rates of TB, that a Class B4 TB immigration waiver designation be created for individuals with normal chest radiographs and positive tuberculin skin tests, and that all immigrants with Class B TB conditions and positive tuberculin skin tests be required to undergo evaluation and (when indicated) treatment for latent TB infection before receiving a permanent residency card.[17]

Our finding that 7% of refugees to Minnesota were HBsAg-positive is consistent with national data; of refugees arriving in the U.S. from mid-1993 through mid-1995 who were screened for HBsAg, 6% had a positive result.[3] Hepatitis B infection is endemic in many parts of the world, including Africa and Southeast Asia.[18] Similar to other reports of refugees from African countries such as Ethiopia and Somalia,[3,19] a substantial proportion of African refugees in this analysis were HBsAg-positive. The smaller proportion (3%) of Southeast Asian refugees who were positive for HBsAg must be interpreted cautiously, given the relatively small numbers tested in 1999. For refugees and immigrants to Minnesota during 1979–1991, the prevalence of HBsAg for different Southeast Asian ethnic groups was 10–15%[20]; this number was consistent with national refugee screening data,[19] as well as Minnesota data for 1996 when more than 400 Southeast Asian refugees were tested.[6]

There are many reasons why refugees should be screened for hepatitis B virus infection. Those with chronic hepatitis B virus infection are at risk for pro-

gression to cirrhosis and hepatocellular carcinoma, and should receive additional medical follow-up. Individuals with current hepatitis B virus infection require counseling about ways to reduce hepatitis B virus transmission to others.[8] Vaccination can also be offered to close contacts (including sexual partners and household contacts) of HBsAg-positive patients, and infants born to HBsAg-positive women need vaccine and immune globulin.[9] A refugee from a country where hepatitis B is endemic and who is found to be hepatitis B virus seronegative is a strong candidate for vaccination, given the possibility of close contact with others from that country who are infected. Although prevaccination serologic testing may not be cost-effective in low prevalence populations, preimmunization testing may be preferable when the expected prevalence of prior infection exceeds 30%.[21] Knowledge of the hepatitis B virus seroprevalence rate in different populations therefore can be of assistance in formulating appropriate vaccination strategies.

In this analysis, most people were tested for HBsAg (indicating current acute or chronic infection) and HBsAb (indicating immunity); only a minority was tested for HBcAb (seen with either current or previous natural infection). An alternative approach taken in some screening studies is to initially screen all samples for HBcAb, with follow-up testing of patients who are HBcAb-positive. The benefits of this approach must be weighed against logistical issues involved with the need for additional follow-up testing of patient specimens, especially in populations with high rates of hepatitis B virus infection. This approach may be most cost-effective in screening populations with a low prevalence of hepatitis B virus infection.

Twenty-two percent of refugees in this analysis had a positive stool examination for at least one of eight specific parasitic infections. Of refugees arriving in the U.S. from mid-1993 through mid-1995 who were screened for stool parasites, 30% had at least one parasite identified.[3] Different surveys of parasitic infections among refugees may arrive at different prevalence estimates, depending on the specific geographic mix of the survey population. Among Eastern European refugees (who constituted about 23% of refugee arrivals to Minnesota in 1999), the prevalence of parasitic infections was about 10%. In contrast, 25% of African refugees had at least one intestinal parasite. This proportion is similar to another study of Somali and Ethiopian immigrants to Minnesota, in which examination of stool samples showed evidence of pathogenic parasites in 27%.[22] In our sample, the most frequently reported parasite was *Trichuris*; this finding is consistent with another screening study of Somali refugees before immigration, in which *Trichuris* was also the most commonly identified intestinal parasite.[23] In addition to the overall proportion of intestinal parasites, the distribution of specific parasitic infections may differ significantly not only by geographic region, but also by country/ethnicity within a specific region, as demonstrated in one study comparing intestinal parasites in Vietnamese, Cambodian, Laotian, and Hmong refugees.[24]

Screening for intestinal parasites is an important component of the health examination for all refugees, including children, who had the highest prevalence of intestinal parasitic infection in our analysis. It is estimated that, at any given time, approximately 450 million people worldwide, most of them children, are ill as a result of soil-borne intestinal parasitic infections such as those caused by *Trichuris trichiura*, *Ascaris lumbricoides*, or hookworm.[25] Chronic infection with these organisms can impair physical and mental growth, nutrition, and development for a variety of reasons, including iron deficiency anemia due to hookworm;[25] malabsorption of fats, carbohydrates, sugars, and vitamins due to *Giardia*;[26] or obstruction of the intestine, pancreatic duct, or bile duct due to *Ascaris*.[27] Other parasitic infections not included in our analysis, such as malaria, should also be considered in the appropriate clinical setting. MDH also recommends that the refugee health assessment should include a complete blood count and differential, with eosinophilia investigated.

Our findings are subject to several potential limitations. First, this analysis relied upon information provided by individual physicians or clinics. Tuberculin skin testing, parasitic stool examination, and other clinical or laboratory assessments require that specific procedures be followed.[28,29] Deficiencies in any of these areas can lead to inaccurate results. For example, although MDH recommends on the Refugee Health Assessment Form that screening for intestinal ova and parasites include examination of three stool specimens obtained more than 24 hours apart, we cannot guarantee that all specimens were completely and correctly obtained. This supports the importance of having trained and experienced personnel perform all aspects of the refugee health assessment.

It is possible that rates of certain infections were even greater than reported in this analysis. For example, for purposes of this epidemiologic analysis, we defined a positive tuberculin skin test as ≥10 mm induration, consistent with recommended criteria for tuberculin positivity in recent immigrants from coun-

tries with a high prevalence of TB.[7] For purposes of clinical management, however, certain people with a skin test response of ≥5 mm also are considered to have a positive tuberculin reaction and may be candidates for chemoprophylaxis. These people include individuals with certain immunosuppressive conditions including HIV, individuals who are recent contacts of infectious TB case patients, and individuals with fibrotic changes on chest radiographs consistent with prior TB.[7] For parasites such as *Giardia lamblia*, additional tests on stool specimens, such as the enzyme immunoassay or direct immunofluorescence assay, may increase the diagnostic yield.[30]

Although it is encouraging that many refugees received their domestic health assessment within 90 days of arrival, results of a domestic health assessment were never returned to MDH for 35% of primary refugees in Minnesota. Reasons for not receiving results of refugee medical screening include loss to follow-up (including the refugee moving out of the state), the refugee's refusal to receive the health assessment, repeatedly missed appointments, and performance of health screening by a clinician who did not forward results to MDH. That approximately one-third of refugees did not receive a documented domestic health examination is also of concern from a public health perspective. Besides the loss of important surveillance data, failure to receive this medical evaluation has important implications for the health of the individual refugee and possibly his/her close contacts. Health departments need to work closely with voluntary agencies and other organizations that facilitate refugee resettlement to help ensure that all refugees receive this important examination.

Although this analysis focused on refugee screening results, refugees represent only one group of foreign-born persons immigrating to the United States. Refugee status is given to those individuals with a well-founded fear of persecution due to race, religion, nationality, political opinion, or membership in a particular social group. Other foreign-born people arriving to the U.S. with a different legal status, such as long-term permanent residents, people with authorized employment, students, and international adoptees, also need and would benefit from infectious disease screening and other medical evaluation. For example, of 160 Tibetan immigrants to Minnesota who received tuberculin skin testing, 98% had a positive result.[31]

Refugees may suffer from other infections besides those evaluated in this analysis, such as hepatitis C virus or sexually transmitted diseases. Refugees may have other health needs, such as missed immunizations, nutritional deficiencies, dental disease, hearing and vision problems, anemia, skin disease, the need for prenatal care, and mental health problems.[2,3] Health officials conducting medical evaluation of refugees and other immigrants therefore should view screening recommendations as minimum rather than complete guidelines, to be augmented based on patient needs, clinical judgment, and epidemiological considerations.

Addressing a refugee's health needs also does not end with the initial screening process. Complete and appropriate follow-up of clinical conditions identified during this evaluation are essential. Screening programs are most valuable if adequate facilities for follow-up diagnosis and medical treatment are available, and if subsequent interventions resulting from this screening might prevent or change the natural history of the disease under consideration.[32] Screening may benefit not only the refugee, but also the family members; offering vaccine to household contacts of those with chronic hepatitis B virus infection is one example of such benefit..

Refugees may face a number of barriers to receiving appropriate health care, including language, social, and cultural differences.[33] They may also face economic barriers. Refugee Medical Assistance, a federally authorized program, can help cover the refugee's health care costs for up to eight months after arrival. Options for health care support after this time include job-related insurance (if an individual is employed) or enrollment in state-sponsored insurance programs. However, some foreign-born U.S. residents may lack employer-sponsored insurance, government coverage, or other health benefits,[34] limiting their options for seeking health care.

Meeting the diverse needs of refugees and other immigrants requires strong partnerships and coordination between public health agencies, health plans and other health care providers, employers, schools, voluntary agencies facilitating resettlement, community agencies representing immigrant populations, and other organizations. The need for strong leadership and participation from the public sector underscores the need for adequate resources to support public health departments in the initial evaluation and follow-up of these new arrivals, as well as the need for experienced and culturally competent health care providers. Refugees remind us that, ultimately, our health as a society is only as good as that provided to those most recently arrived among us.

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