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CHAPTER 127

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Migrant, Immigrant, and Refugee Health

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INTRODUCTION

The global migration landscape has undergone substantial changes in the past quarter century, and the number of population groups contributing to global mobility is steadily rising. The Human Development Report 2009 by the United Nations Development Program estimates 70 million migrants have moved from developing countries to developed ones and more than 200 million migrants have moved between developing countries.¹ Migration is truly a major social phenomenon, with many complex linkages to economic, trade, social, security, and health policies. In the dynamic relationship between migration and health, immigration has long been recognized as having a large impact on disease epidemiology and the use of health services in migrant receiving nations.^{2,3} For example, the impact of immigration on disease epidemiology is demonstrated by the global epidemiology of tuberculosis. Tuberculosis (TB) is a major global cause of infectious disease morbidity and mortality; however, rates of TB in most regions of the developing world are many times higher than those in the developed world (the TB prevalence gap) and are decreasing at a much slower rate.⁴ Many migrant-receiving countries in the developed world have had stable or increased migration of persons from regions with high TB prevalence, while at the same time having successfully decreased TB incidence in their native-borne population, further exacerbating the prevalence gap. Consequently, the majority of TB cases in migrant-receiving countries such as the United States and Canada are now being diagnosed in foreign-born populations from high-prevalence source countries^{5,6} (Fig. 127.1). This linkage between migration and TB epidemiology becomes more significant when designing solutions for the control and prevention of multidrug-resistant (MDR) TB and the emerging threat of extensively drug-resistant (XDR) TB.⁷⁻¹⁰

Many migrant-receiving countries have prearrival medical examination requirements and protocols for entering migrants, which vary both by the types of populations screened and by the diseases for which examination is required. The health conditions tested through the medical examination procedures required by countries such as Canada, Australia, New Zealand, and the United States are determined on the basis of the risk or danger that these conditions can represent to public health and safety and the additional costs that may be incurred by national public services expenditures.¹¹⁻¹⁵ In general, these medical examination procedures include a review of the past medical history, a physical examination, and tests that include a chest radiograph and laboratory analyses. The diseases most frequently tested to determine visa eligibility or admissibility of a migrant are infectious diseases such as tuberculosis, sexually transmitted diseases, and mental or behavioral conditions. Immigration regulations in some countries do allow for the consideration of medical waivers to inadmissible health conditions. Although many migrant-receiving countries in Europe either do not require prearrival health evaluations or have fewer requirements and only limited grounds for refusal of admission based on health grounds, most have provisions for

notification and inspection if a communicable or serious health condition is recognized or suspected.¹⁶

US MIGRATION AND HEALTH SCREENING POLICIES

The number of foreign-born persons living in the United States, almost 38 million in 2007, is greater than ever before in the nation's history representing approximately one-eighth of the total US population.¹⁷ In contrast to the previous twentieth-century US immigration wave, which was dominated by Eastern Europeans who were driven from their countries of origin by such factors as persecution and poverty (so-called "push factors"), the twenty-first century immigration wave, which began in the 1970s, is characterized predominantly by Hispanic followed by Asian migrants who are attracted to the United States for economic opportunities (or "pull factors"). In both waves of migration, migrants have brought with them not only skills and cultural traditions that enriched US economic and social fabric, but also diseases and disease exposures that were different from those existing in US-receiving communities. In addition, twenty-first century migrants are more mobile and remain connected to their countries of birth, typically making several back and forth journeys to visit friends and relatives.¹⁸ New immigrants and refugees, who cross disease prevalence gaps and frequently travel to visit friends and relatives, constitute potentially high-risk populations for translocating communicable diseases of public health significance.

The US Department of Homeland Security has reported more than 175 million nonimmigrant legal admissions, defined as number of entries, not persons, into the United States during 2008.¹⁹ This category includes the approximately 39 million admissions of short-term visitors (tourists, business travelers) and temporary residents (students, specialty workers, diplomats). The majority of these nonimmigrant migrants admitted are not required to undergo health screening prior to US entry. Given the immense numbers of persons crossing US borders and finite resources for evaluation and surveillance, US migrant health screening policy focuses on migrants planning to establish permanent US residence, since this group has the largest potential long-term impact on both disease epidemiology and health care resources utilization. Currently, the US Immigration and Nationality Act (INA) requires that medical screening examinations be performed overseas for all US-bound immigrants and refugees, and in the United States for migrants applying to adjust their visa status to permanent residence (i.e. "green cards").^{20,21} In 2008, the over 1 million immigrants (adjustment of status and new arrivals) and refugees admitted underwent medical screening examinations prior to their admission. The remainder of this chapter covers US medical screening issues for immigrants and refugees. Similar issues and regulations apply across developed and developing countries worldwide. Disease transmission among refugees crowded into camps in resource-limited

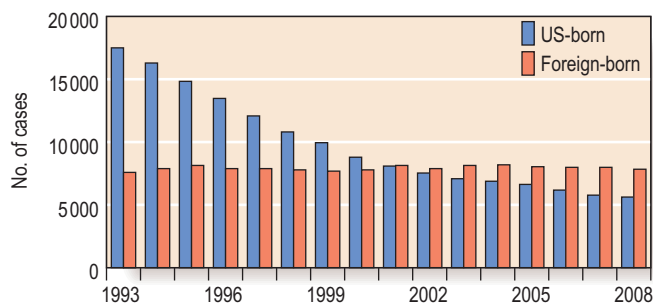


Figure 127.1 Number of tuberculosis cases in US-born versus foreign born persons, United States, 1993–2008. (Data from the Division of Tuberculosis Elimination, Centers for Disease Control and Prevention: www.cdc.gov/tb/statistics.)

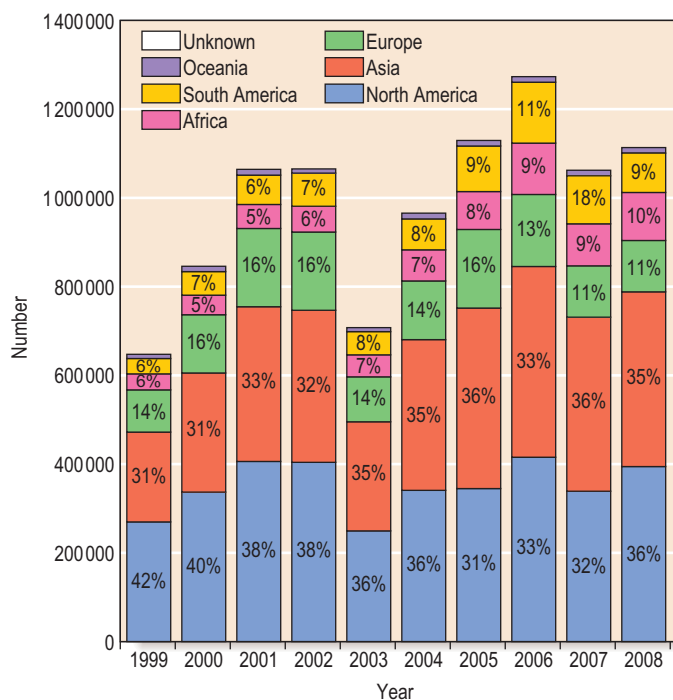


Figure 127.2 US immigrants admitted by region of birth, 1999–2008. (Data from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention.)

countries further accentuates the huge importance of international refugee public health preparedness.

REQUIRED OVERSEAS MEDICAL SCREENING EXAMINATIONS FOR US-BOUND IMMIGRANTS AND REFUGEES

Over 460 000 immigrants and 60 000 refugees arrived in the United States during Fiscal Year 2008. Trends in the number and regions of origin for US-arriving immigrants and refugees have important public health implications in determining the medical evaluation and treatment of these two groups, both overseas and stateside.^{19,22} From 2006 to 2008, over 1.3 million immigrants arrived in the United States; the number of arrivals and regions of origin remained relatively stable over this 3-year period (*Fig. 127.2*). On average, approximately 450 000 immigrants arrived each year, most of these arriving from Asia (majority from China) and the Americas (majority from Mexico), followed by Europe and Africa. From 2006 to 2008, close to 150 000 refugees arrived in the United States; in contrast to immigrants, the number of arrivals and regions of origin have changed markedly over this 3-year period (*Fig. 127.3*). In 2006, the majority of arriving refugees (45%) were from Africa, 25% from Europe, and only 20% of arriving refugees were from

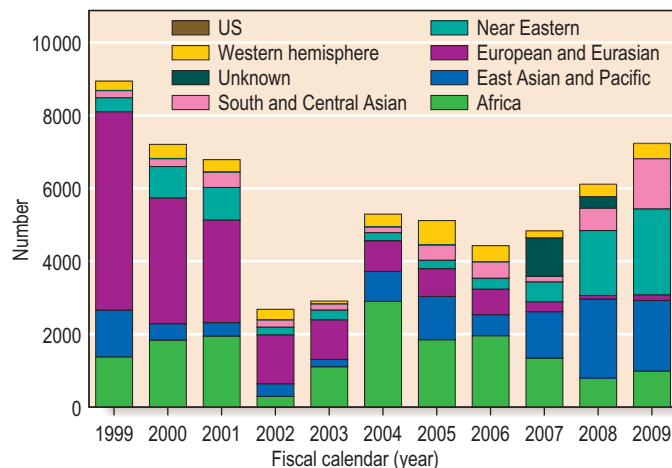


Figure 127.3 US refugee arrivals, 1999–2009. (Data from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention.)

Asia. In contrast, in 2008, almost 75% (approximately 45 000 refugees) arrived from Asia. Trends have important implications for medical evaluation and treatment, both overseas and stateside, as refugees from Africa have relatively high rates of certain diseases, including immunodeficiency virus (HIV) infection, TB, malaria, intestinal helminth infections and other tropical diseases (e.g. schistosomiasis), and likely lack routine vaccinations.^{23,24} Similarly, epidemiological information from Southeast Asia, such as reports of artemisinin-resistant *Plasmodium falciparum* are valuable in alerting on the need to invest in preventive and health promotion activities.²⁵

All immigrants and refugees migrating to the United States are required to have a medical screening examination overseas, which is performed by local physicians (panel physicians) appointed by the local US embassy. The mandated medical examination as defined by federal regulation focuses primarily on detecting diseases determined to be inadmissible conditions for the purposes of visa eligibility. These diseases include certain serious infectious diseases, mental disorders associated with harmful behavior, and substance abuse.

The definition of communicable diseases of public health significance, amended on October 2009 by the US Centers for Disease Control and Prevention (CDC), with the purpose of adding flexibility to respond in a timely way to unpredictable health threats and outbreaks, divides these into three categories:

1. Active tuberculosis, infectious syphilis, gonorrhea, infectious leprosy, chancroid, lymphogranuloma venereum, and granuloma inguinale.
2. Any quarantinable, communicable disease specified by Executive Orders. The current diseases are pandemic flu, severe acute respiratory syndrome (SARS), viral hemorrhagic fevers, cholera, diphtheria, infectious tuberculosis, plague, smallpox, and yellow fever.
3. A communicable disease that may pose a public health emergency of international concern according to the World Health Organization's 2005 International Health Regulations.²⁶

CDC also amended the provisions that describe the scope of the medical examination by incorporating a more flexible, risk-based approach based on medical and epidemiologic factors. This approach will determine which diseases are included in the medical screening and testing of immigrants and refugees in areas of the world that are experiencing outbreaks of specific diseases.²⁷

With regard to HIV infection and inadmissibility, in 2008 by federal legislative mandate, the statutory ban on nonimmigrants, immigrants and refugees with HIV from entering the United States was removed. Subsequently on November 2, 2009 the CDC posted a Final Rule removing HIV infection from the list of excludable communicable diseases of public health significance, as it is well established that HIV-infected

foreign travelers, immigrants, and refugees entering the United States are not a threat to the public's health.²⁸

For the purposes of determining the inadmissibility of an applicant, medical conditions are categorized as class A or B. Class A conditions are defined as those conditions which preclude an immigrant or refugee from entering the United States. Class A conditions require approved waivers for US entry and immediate medical follow-up upon arrival. These conditions include communicable diseases of public health significance, a physical or mental disorder associated with violent or harmful behavior, and drug abuse or addiction. Class B conditions are defined as significant health problems: physical or mental abnormalities, diseases, or disabilities serious in degree or permanent in nature amounting to a substantial departure from normal well-being. Follow-up evaluation soon after US arrival is recommended for migrants with class B conditions. If an immigrant or refugee is found to have an inadmissible condition that may make them ineligible for a visa, a visa may still be issued after the illness has been adequately treated or after a waiver of the visa eligibility has been approved by the US Department of Homeland Security.

In 1996, a new subsection was added to the INA requiring that persons seeking immigrant visas for permanent residency show proof of receipt of at least the first dose of all vaccination series recommended by the American Committee for Immunization Practices (ACIP). Although these regulations apply to all adult immigrants and most immigrant children, internationally adopted children who are younger than 10 years of age have been exempted from the immunization requirements as a consequence of strong objections posed by advocacy groups, who cited safety concerns over immunization practices in several origin countries. In 2009 the CDC proposed that revised criteria be used in determining which vaccines recommended by the ACIP and not specifically listed in immigration law should be required for immigrants seeking admission into the United States or those seeking adjustment of status for permanent residency. Proposed criteria are:

- The vaccine must be age-appropriate, as recommended by ACIP for the general US population.
- AND at least one of the following:
- The vaccine must protect against a disease that has the potential to cause an outbreak.
- The vaccine must protect against a disease that has been eliminated from the United States or is in the process of being eliminated in the United States.

These criteria were posted for public viewing in the Federal Register on November 2009 and will allow CDC the flexibility to adapt vaccination requirements for US immigrants based on public health needs.²⁹ At this time, refugees are not required to meet the INA immunization requirements at the time of initial entry into the United States but must show proof of vaccination at the time they apply for permanent US residence, typically within 3 years of US arrival. This policy is under review.

The US Centers for Disease Control and Prevention (CDC), Division of Global Migration and Quarantine (DGMQ), is responsible for providing technical guidance to the panel physicians performing the overseas medical screening examination.²⁰ The testing modalities recommended for the medical examination are outlined in **Table 127.1**, and the algorithm for the required overseas medical screening examination is presented in **Figure 127.4**. In 2007, CDC DGMQ published the revised requirements for the TB screening section of the overseas medical examination, called 2007 Technical Instruction for Tuberculosis Screening and Treatment³⁰ (**Fig. 127.5**). This updated version requires:

- sputum smears and mycobacterial cultures for applicants suspected of having TB
- drug susceptibility testing (DST) on isolates positive for *Mycobacterium tuberculosis*
- treatment to be delivered as directly observed therapy (DOT) and completed before traveling to the United States.

Although the 1991 TB Technical Instructions (TB TI) uses a high yield algorithm for identifying tuberculosis, changes were introduced as it was

Table 127.1 Testing for Required Overseas Medical Screening Examination

Health Condition	Testing
Tuberculosis	Chest radiograph; sputum smears and cultures if CXR positive. Drug susceptibility testing if culture positive
Syphilis	Serology
Other sexually transmitted diseases	Physical examination
Leprosy (Hansen's disease)	Physical examination
Mental disorders with associated harmful behavior	History
Drug abuse or addiction	History, physical examination
Vaccinations	History/vaccination records serology

(Data from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention)

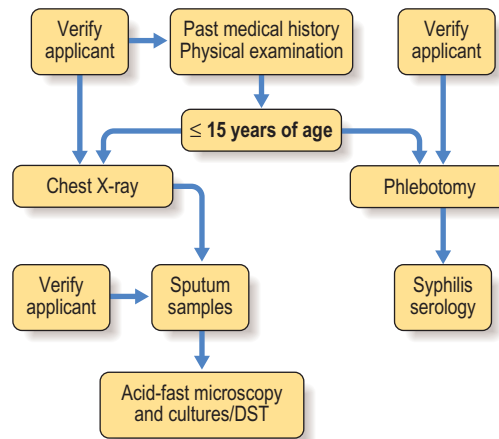


Figure 127.4 Required overseas medical screening examination from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention. DST, drug susceptibility testing.

determined that 1991 TB instructions were insensitive and miss smear-negative, culture-positive cases, and inadequate to prevent the importation of MDR TB into the United States.^{7,31} The implementation of the 2007 TB TI overseas is being done in phases based on a set of priorities that include: number of immigrants admitted to the United States, number of refugees resettling to the United States, and burden of tuberculosis in the country of origin. The 2007 TB TI have been implemented for US-bound populations from Botswana, China, Dominican Republic, Ethiopia, Haiti, Hong Kong Special Administrative Region (SAR), Japan, Jordan, Kenya, Lesotho, Macau SAR, Malaysia (refugees only), Mexico, Mozambique, Namibia, Nepal (refugees only), Philippines, South Africa, Swaziland, Taiwan, Tanzania, Thailand (refugees only), Turkey, Uganda, and Vietnam.

The CDC DGMQ is also responsible for monitoring the quality of the overseas medical examination process at over 650 panel physician sites (health care staff, radiology facilities, vaccination programs, and laboratories) worldwide, through its Quality Assurance Program (QAP). Owing to limited resources, not all panel physician sites can be visited and assessed annually. Sites are prioritized for monitoring based upon the number of immigrant and refugee visas processed and country-specific prevalence of such diseases as TB and HIV. In addition, DGMQ performs remediation visits when medical screening examination deficiencies have been identified. In an effort to share experiences regarding the optimization of immigration medical processes, technical aspects of the medical screening, the performance evaluation of panel physicians, and review policies, regulations, and practices of the various resettlement nations,

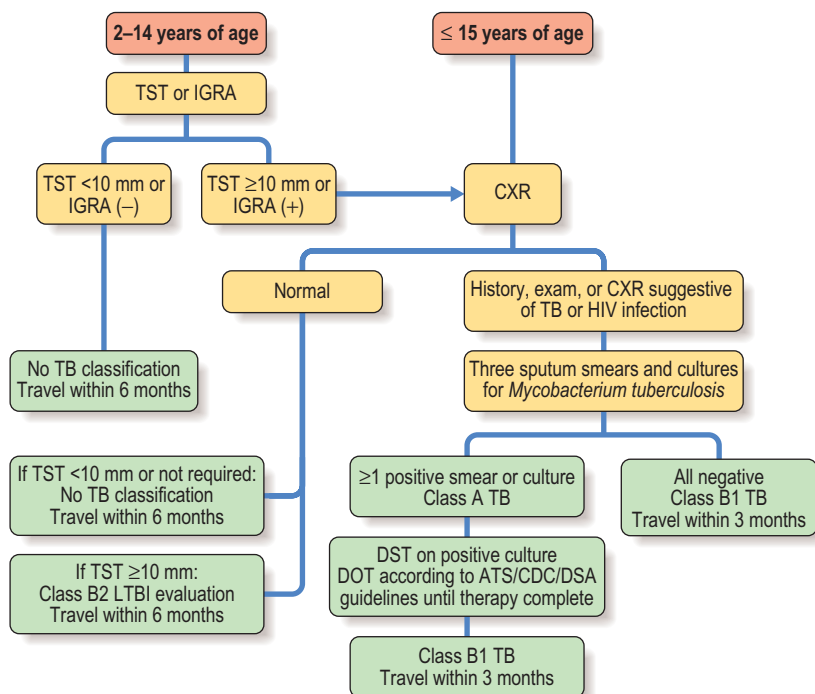


Figure 127.5 Required overseas tuberculosis screening medical examination from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention (CDC). TST, TB skin test; IGRA, interferon- γ release assay; CXR, chest X-ray; LTBI, latent TB infection; DST, drug susceptibility testing; DOT, directly observed therapy; ATS, American Thoracic Society; IDSA, Infectious Diseases Society of America.

DGMQ meets annually with sister agencies from other countries (Canada, Australia, New Zealand, and the United Kingdom) to discuss possible approaches to common challenges such as health information systems, privacy, confidentiality, and resource utilization and constraints.

HEALTH CONDITIONS IDENTIFIED THROUGH REQUIRED OVERSEAS MEDICAL SCREENING EXAMINATIONS

The number and types of health conditions identified through required overseas medical screening examinations and captured into the CDC Electronic Disease Notification (EDN) database, from 20 000 immigrants and 140 000 refugees who arrived in the United States between 2007 and 2009, are summarized in [Table 127.2](#). For both refugees and immigrants, the most frequent conditions identified were suspected active (B1) and inactive (B2) tuberculosis.

The underlying objective of the overseas TB screening process is to limit the entry of persons seeking long-term or permanent US residence who have infectious (defined as acid-fast bacilli (AFB) smear and/or culture-positive) active TB and who therefore pose an immediate public health risk, and to refer others with suspected active and inactive TB for further evaluation and treatment in the United States. This objective is connected to the facts that, as in previous years, in 2008 approximately over half (58.5%) of the 12 898 new tuberculosis cases in the United States were diagnosed among foreign-born persons and the TB rate in foreign-born persons in the United States was 10 times higher than in the US-born population.³²

The high rates of TB in newly arrived immigrants and refugees underscore the importance of both revised overseas TB screening requirements and assuring timely and appropriate US follow-up evaluation of immigrants and refugees with suspected active TB. Together with deployment in 2007 of the EDN system, and its nationwide coverage capacity, notification delays have been minimized; and most of the operational potentially negative factors have been reduced.

Table 127.2 Number of Health Conditions Identified through Overseas Medical Screening Examination, among Immigrants and Refugees 2007–2009 (Data from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention)

Health Conditions	Immigrants	Refugees	Total
Infectious (AFB+) active TB: class A	12	5	17
Not infectious (AFB-) active TB: class B1	8800	4844	13 644
Not active TB: class B2	10 133	2542	12 675
HIV ^a	358	448	806
Syphilis	131	209	340
Leprosy (Hansen's disease)	6	21	27
Mental disorder associated with harmful behavior	67	893	940
Drug abuse or addiction	12	47	59
Total	19519	8989	28508

^aHIV testing not required after January 4, 2010.

AFB, acid-fast bacilli; TB, tuberculosis; HIV, human immunodeficiency virus.

The number of HIV infections identified during the overseas medical screening examination is relatively small. Early identification of HIV infections among immigrants and refugees is important to assure appropriate notification and linkages to medical services in resettlement communities. Current regulations require that syphilis infections be treated before departure to the United States. During 2007–2009, fewer than 350 immigrants and refugees infected with syphilis were identified overseas and captured into EDN. In reference to other inadmissible conditions listed in [Table 127.2](#), fewer than 30 cases of leprosy (Hansen's disease), fewer than 1000 cases of mental disorder associated with harmful behavior, and 59 cases of drug abuse or addiction were identified among US-bound immigrants and refugees.

The CDC DGMQ notifies state and local health departments of all arriving refugees and those immigrants with health conditions who are

resettling in their jurisdiction that need follow-up evaluation and possible treatment in the United States. Under the current system, forms summarizing the results of the overseas medical examination, including classification of health conditions, are manually collected at US ports of entry. This information is then transmitted electronically to state and local health departments. State and local health departments are asked to report to DGMQ the results of these US follow-up evaluations via a web-based system and to report any significant public health conditions occurring among recently arrived immigrants and refugees. This is a way to better understand epidemiologic patterns of disease in recently arrived migrants and to monitor the quality of overseas medical examination.

NEW HEALTH SCREENING PROGRAM INITIATIVES TO IMPROVE IMMIGRANT AND REFUGEE HEALTH

Electronic Disease Notification System

The purpose of the EDN system is to electronically notify state and local health departments of newly arriving immigrants and refugees with a TB condition using the CDC secure data network. The EDN system provides federal and state public health officials with an electronic system to inform other health departments of secondary migration of immigrants and refugees with TB conditions within the United States, data to evaluate the effectiveness of follow-up on TB cases, and the ability to record the results of the domestic TB follow-up examination.³³ In addition, it allows comparison of overseas health assessments with domestic follow-up outcomes as part of a comprehensive quality assessment program for overseas TB screening examinations. The EDN system has a fully functional module that is used by all 50 states and plays a significant role in enhancing TB control and prevention efforts among arriving immigrants and refugees. The EDN system has the capability to interconnect with other data systems, such as the interface created with the International Organization for Migration (IOM) health information system, allowing electronic transmission of refugee medical examination data in a secure and timely manner, eliminating the manual entry of medical information upon their arrival to the United States. Currently, the EDN database contains information for over 150 000 medical records. The next objective for EDN is to be redesigned to include other disease modules, including disease of pandemic or bioterrorism potential, and to develop it into a real-time disease surveillance and response system.

Enhanced Refugee Health Program Initiative

The UN High Commissioner for Refugees (UNHCR) estimated that in 2008, worldwide, there were 15.2 million refugees and a total of 42 million people of concern (including refugees, internally displaced persons, and stateless persons).³⁴ Every year, the United States provides a safe place and freedom to 50 000–70 000 refugees from around the world who are fleeing political, religious, and ethnic persecution. Between 2007, when an Iraqi resettlement program was started, and 2009 when more than 20 000 Iraqi refugees have arrived in the United States.¹⁹

It has long been recognized that refugees may carry significant disease burdens, which are determined by geographic origin, ethnicity, and living and health conditions in countries of origin or departure.^{35,36} Refugees can suffer from a multitude of health conditions, including infectious diseases (such as tuberculosis and many tropical and parasitic diseases), malnutrition, reproductive health needs, physical trauma, and mental health disorders, often caused by tenuous circumstances in their countries of origin or departure.^{35–41} Such disease burdens can seriously hamper refugees' ability to successfully integrate and optimally contribute to their resettlement communities and may cause strain on health and social services systems in the United States.³⁷ Most of these health conditions are not addressed during the required overseas medical examination process.

Refugees do receive stateside evaluation and treatment, usually conducted at state or local health departments, within 3 months of US arrival. However, there is currently no standardized nationwide protocol for postarrival health assessment, and therefore the content of postarrival refugee health evaluations varies from state to state, and funding sources are often noted to be inadequate to provide comprehensive services. CDC DGMQ has made available refugee health guidelines, which include clinical testing and medical treatment options.⁴² Further, refugees often have other daily demands to achieve integration into their new living environment that may compete with their need for health evaluations and treatment. Optimizing refugee health prior to resettlement and addressing refugee health needs, such as vaccination and presumptive treatments, early in the migration process can be cost-effective and can prevent larger expenditures later.^{43–49}

Realization of this fact has led to the development of the US Enhanced Refugee Health Program (ERHP), an initiative aimed at achieving integration of the health needs of refugee populations with facilities of the host and receiving countries. The US CDC developed the initiative, in collaboration with the US Department of State, Bureau of Population, Refugees, and Migration (PRM), the US Department of Health and Human Services, Office of Refugee Resettlement (ORR), the International Organization for Migration (IOM), and US state and local health departments, to begin to comprehensively address health care needs of US-destined refugees while they are still overseas, and to facilitate and promote appropriate stateside evaluation and treatment. The ERHP currently focuses on refugees for a number of reasons: (1) refugees are vulnerable populations, exposed to a variety of harsh environmental conditions and diverse diseases, with limited access to health care; (2) a unique opportunity exists to address refugee health concerns during required overseas health assessments; (3) the language and charge of the US Refugee Act provide more latitude to address conditions of public health concern among refugees (in addition to inadmissible conditions); and (4) lessons learned from a focus on the smaller number of refugees may be potentially applicable to the larger numbers of immigrants or other migrant groups.

The overseas component of the ERHP addresses five major areas:

- Vaccine-preventable diseases, including the Advisory Committee on Immunization Practices (ACIP)-recommended pediatric vaccinations and selected adult vaccinations.
- Tuberculosis: implement the revised 2007 Technical Instructions for Tuberculosis Screening and Treatment which stipulates improved diagnostic testing with cultures and drug susceptibility testing, directly observed treatment, and expanding tuberculosis screening to all ≥ 6 months of age.
- HIV infection: with activities that focus on preventing perinatal transmission through the provision of intrapartum antiretroviral therapy for HIV-infected pregnant women, the use of co-trimoxazole for prevention of opportunistic infections and the referral of HIV-infected refugees to Global AIDS Program services, where available.
- Parasitic (malaria, schistosomiasis, strongyloides, roundworms) and waterborne diseases. The proposed parasitic and waterborne diseases component includes presumptive treatment for malaria, and intestinal parasites, such as schistosomiasis, strongyloides, and roundworms, and the use of other measures, such as Safe Water Systems, to prevent waterborne diseases.
- Surveillance for emerging infectious diseases, focusing on the inclusion of US-bound refugees in global surveillance activities for febrile and respiratory illnesses, such as 2009 H1N1 flu and avian influenza.

The ERHP strategy is to utilize the required overseas medical examination process as a unique opportunity to assess and improve the health status of refugees overseas, and to incorporate both required screening components for inadmissible conditions and additional expanded components, which are tailored to specific refugee population needs and targeted to diseases of public health importance. The program ensures quality

staffing and infrastructure in the field evaluating, training, and lending resources. For this purpose, in 2007, CDC DGMQ established two international offices located in Kenya and Thailand. Extending health services in the country of origin or transit allows patients to be served by health care providers who are closer geographically and often culturally to the patients' circumstances and health needs. Furthermore, through the development of enhanced and electronic data exchange systems, ERHP promotes more timely transmission of population-based health and medical examination data acquired overseas to US health departments in resettlement communities, facilitating appropriate follow-up and treatment of refugees after arrival in the United States. The domestic component of the ERHP strives to support and standardize follow-up evaluation and treatment of refugees after US arrival by state and local health departments and other community health care providers.

Since 1997, the CDC has undertaken enhanced refugee health programs for at least eight large-scale, emergent movements of refugee populations and one US-based intervention for the Lost Boys and Girls of Sudan. These programs have included components to provide presumptive predeparture treatment for malaria, intestinal parasites, and other tropical diseases, expanded TB diagnosis and treatment, HIV services, appropriate immunizations, dental and mental health assessments, chronic disease evaluations, and postarrival treatment for schistosomiasis and strongyloides infection. These programs have successfully prevented thousands of cases of intestinal parasitosis, malaria, TB, and vaccine-preventable diseases and hundreds of cases of other communicable diseases among US-bound refugees.⁵⁰⁻⁵² Other integral components of the

ERHP initiative have been efforts to provide linkages to US programs in host countries, such as the Global AIDS Program (GAP) and the Global Disease Detection (GDD) Program, which can provide diagnostic, treatment and prevention services to refugees awaiting US resettlement. Such efforts are aimed at assuring refugees access to needed health care services in a prompt manner even while still in asylum countries prior to US resettlement, and to reduce the burden placed on host country resources, since overseas interventions can decrease refugee health utilization once in the United States, reduce treatment cost, and avoid overburdening the domestic health system. Finally, some more recent ERHP programs have included enhanced surveillance and response for emerging infectious diseases, including vector-borne and vaccine-preventable diseases, and most recently, 2009 H1N1 flu and H5N1 avian influenza. As part of the EHRP for Liberian refugees in Côte d'Ivoire, field staff were able to identify O'nyong-nyong fever, an emerging infectious disease in West Africa, and prevent its importation.⁵³

Vaccine preventable diseases are a source of significant morbidity and mortality in developing countries, and refugees are known to be under-vaccinated owing to collapsing public health infrastructures in countries of origin or departure and lack of access to health care.⁵⁴ In addition, outbreaks of measles, pertussis, and varicella among US-bound Somali refugees in Kenya in 2007, 2008, and 2009, malaria among Burundians in 2007, as well as varicella among Bhutanese refugees in Nepal and measles among Burmese refugees in Thailand in 2008, were identified and controlled during ERHP programs. As a result of these and other disease outbreaks such as cholera (Fig. 127.6), the movement of refugees has

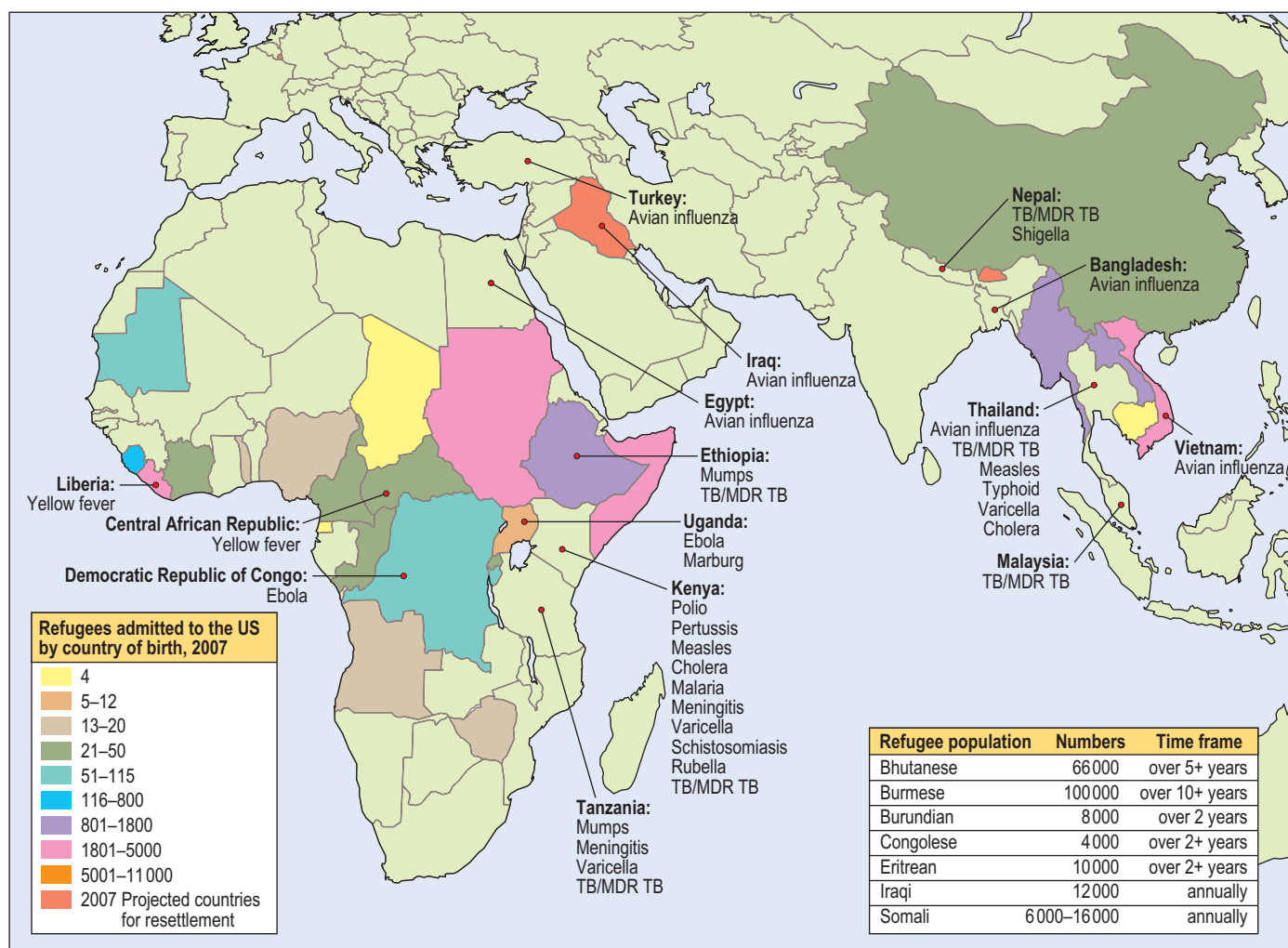


Figure 127.6 Disease outbreaks and diseases of concern in US-bound refugees, 2006-2008, from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention.

Table 127.3 Requirements for Routine Vaccination of Immigrants Examined Overseas Who Are Not Fully Vaccinated or Lack Documentation

Vaccine	Age						
	Birth to 1 Month	2–11 Months	12 Months to 6 Years	7–10 Years	11–17 Years	18–64 Years	≥65 Years
DTP/DTaP/DT	NO	YES		NO			
Td/Tdap	NO			YES, ≥7 years old (for Td); 10–64 years old (for Tdap)			
Polio (IPV/OPV)	NO	YES				NO	
MMR	NO		YES, if born in 1957 or later			NO	
Rotavirus	NO	YES, 2–6 months old	NO				
Hib	NO	Yes, 2–59 months old		NO			
Hepatitis A	NO		YES, 12–23 months old	NO			
Hepatitis B	YES, through 18 years old					NO	
Meningococcal (MCV/MPSV)	NO				Yes, 11–18 years old	NO	
Varicella	NO		YES				
Pneumococcal	NO	YES, 2–59 months old (for PCV)		NO			YES (for PPV)
Influenza	NO		YES, 6 months to 18 years old (annually each flu season)			NO	YES, ≥50 years old (annually each flu season)

DTP, diphtheria and tetanus toxoids and pertussis vaccine; DTaP, diphtheria and tetanus toxoids and acellular pertussis vaccine; DT, pediatric formulation diphtheria and tetanus toxoids; Td, adult formulation tetanus and diphtheria toxoids; Tdap, adolescent and adult formulation tetanus and diphtheria toxoids and acellular pertussis vaccine (Boostrix for persons 10–18 years old; Adacel for persons 11–64 years old); IPV, inactivated poliovirus vaccine (killed); OPV, oral poliovirus vaccine (live); MMR, combined measles, mumps, rubella vaccine; Hib, *Haemophilus influenzae* type b conjugate vaccine; MCV, meningococcal conjugate vaccine; MPSV, meningococcal polysaccharide vaccine; PCV, pneumococcal conjugate vaccine; PPV, pneumococcal polysaccharide vaccine. (Data from the Division of Global Migration and Quarantine, Centers for Disease Control and Prevention.)

frequently been delayed and necessitated substantial additional per capita investments in the resettlement process (e.g., last-minute cancellation of nonrefundable commercial airline tickets and the need for dedicated refugee charter flights), not to mention the obvious risks to refugee health and threat of importation and spread of disease in receiving communities.

To prevent morbidity, mortality, and the threats of disease importation along with the avoidance of costly delays in refugee resettlement, CDC DGMQ recommends that refugees also receive age-appropriate immunizations listed in the *Technical Instructions to Panel Physicians for Vaccination Requirements* (for immigrants) if the vaccines are available in-country or easily obtained (Table 127.3). CDC recognizes that some vaccines may not be available in all host countries, and therefore vaccination with some vaccines may not be feasible. However, common vaccines that can be routinely obtained overseas for use in most host countries include diphtheria and tetanus toxoids and pertussis (DTP), tetanus and diphtheria toxoids (Td), live oral poliovirus (OPV), measles-mumps-rubella (MMR), hepatitis B, and varicella; an initial dose of vaccines in these series should be administered as early as possible before migration to maximize utility and protection.⁴⁶ The following vaccinations may not be easily obtained in host countries: *Haemophilus influenzae* (Hib), *Streptococcus pneumoniae*, and influenza. If vaccines are not available in host countries, they should be administered as soon as possible after arrival in the United States.

In Fiscal Year 2008, the total number of adoptions to the United States was over 17 000. The five countries from which Americans adopted the largest number of children were: Guatemala, China, Russia, Ethiopia, and South Korea. Special concerns for internationally adopted children include hepatitis B and C, measles, syphilis, HIV infection, TB, and intestinal parasitic infections, which may warrant screening in addition to a review and update of routine childhood immunizations.^{55–57}

FUTURE DIRECTIONS

Migrant, immigrant, and refugee health aims to shift the migration health paradigm away from a focus merely on inadmissible conditions and regulatory exclusion toward integration of migration and health needs, which is advantageous not only for the health of migrant populations but also for those in host countries and the receiving communities. Achieving more integrated and comprehensive migration health programs and policies, includes:

- Continuing efforts to tailor migration health policies to incorporate the unique needs of migrant populations and to provide flexibility to address emerging global health issues, such as pandemic flu.
- Expanding the role of migration health assessments in protecting public health of migrants and of receiving and host countries. Priority areas should include the following:
 - support for delivery of essential preventive and treatment interventions, such as vaccinations and treatment for malaria and other parasitic diseases
 - creation of effective surveillance systems for emerging infectious diseases
 - development of emergency response capacity
 - inclusion of components to address emerging infectious diseases, reproductive and mental health needs, and other diseases of public health importance.
- Applying new information technology to secure electronic information exchange among numerous international and interagency partners and assuring real-time communication of health data along the migration pathway.
- Identifying sustainable funding to support migration health programs, in both receiving and host countries.

5. Promoting public–private partnerships to address migrant health issues.
6. Developing international and interagency partnerships to facilitate harmonization of policies and the integration of global migration and health issues.

Ultimately, health and migration are intimately linked and interdependent. Early investment in addressing and integrating the health needs of migrants and of receiving and host communities will facilitate the migration process, improve migrant health, decrease associated morbidity and mortality, and avoid long-term health resource and social costs, and protect global public health.



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