Key Points
- In 2009, the prevalence of asthma increased to 7.7% among adults, 9.6% among all children, and 17.0% among black, non-Hispanic children.
- In 2008, approximately half of persons with asthma reported having had at least one asthma attack during the preceding 12 months.
- Medical expenses associated with asthma amounted to $3,259 per person per year during 2002–2007.
- Good control of asthma includes self-management training, appropriate use of inhaled corticosteroids to prevent symptoms and attacks, and avoidance of environmental allergens and irritants. However, only approximately one third of persons with asthma had been given an asthma action plan as recommended and approximately half had been advised to change their environment.
- More uninsured than insured persons with asthma reported not being able to buy prescription medications (40.3% versus 11.5%).

objectives 24-6 and 24-7.6,16 For example, the NAEPP expert panel recommends that every person with asthma have an asthma action plan, yet only one third of adults and children reported having such a plan. An asthma action plan is a written form developed by health-care providers to address the specific needs and circumstances of an individual patient. The plan describes (1) how to monitor symptoms, (2) when to change the amount or type of medication, (3) how to identify and avoid exposure to allergens and irritants, (4) how to recognize worsening asthma symptoms, and (5) when to take action, such as calling the physician for advice or going to the emergency department.2 Although multitrigger/multicomponent home-based environmental interventions are known to improve asthma symptoms (median decrease of 21 days with symptoms per year) and to reduce missed days of school among children (median decrease of 12 days per year), only half of children/caregivers were advised to change conditions at school, home, or work to reduce environmental triggers.17

The findings in this report are subject to at least one limitation. NHS and BRFSS data are based on adult self-report or adult proxy response for children; therefore, the findings might be biased as a result of inaccurate recall or the social desirability of providing positive responses. The findings suggest the need for coordinated efforts at the local, state, and national levels to develop programs that empower persons with asthma to better control and manage their asthma. Health-care providers and public health officials should continue to address gaps in access to care and to support preventive measures that can improve asthma health outcomes by promoting appropriate medical care, asthma self-management education, and evidence-based interventions to reduce modifiable risk factors (e.g., environmental irritants and allergens) for asthma. Actions to expand reimbursement for asthma education and environmental control services might further improve the application of asthma self-management strategies.

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Japanese Encephalitis in Two Children—United States, 2010

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JAPANESE ENCEPHALITIS VIRUS (JEV) IS THE LEADING CAUSE OF VACCINE-PREVENTABLE ENCEPHALITIS IN ASIA AND THE WESTERN PACIFIC. JEV IS MAINTAINED IN AN ENZOOTIC CYCLE INVOLVING MOSQUITOES AND AMPLIFYING VERTEBRATE HOSTS, MAINLY PIGS AND WADING BIRDS. THE VIRUS IS TRANSMITTED TO HUMANS PRIMARILY BY CULEX MOSQUITOES, WHICH BREED IN FLOODED RICE FIELDS AND POOLS OF STAGNANT WATER AND MOST OFTEN FEED OUTDOORS DURING THE EVENING AND NIGHT. JEV TRANSMISSION OCCURS MAINLY IN RURAL AGRICULTURAL AREAS, BUT OCCASIONAL HUMAN CASES OCCUR IN URBAN AREAS. JAPANESE ENCEPHALITIS (JE) IN PERSONS WHO HAVE TRAVELED OR LIVED OVERSEAS IS DIAGNOSED INFREQUENTLY IN THE UNITED STATES, WITH ONLY FOUR CASES IDENTIFIED FROM 1992 (WHEN A JEV VACCINE WAS FIRST LICENSED IN THE UNITED STATES) TO 2008.1 THIS REPORT DESCRIBES THE ONLY CASES DIAGNOSED IN THE UNITED STATES AND REPORTED TO CDC SINCE THEN. THE FIRST WAS A FATAL CASE IN A U.S. CHILD WHO HAD VISITED RELATIVES IN THE PHILIPPINES. THE OTHER OCCURRED IN A REFUGEE WHO BECAME ILL WHILE TRAVELING FROM THAILAND TO THE UNITED STATES AND WHOSE DIAGNOSIS WAS COMPLICATED BY CONCURRENT NEUROCYSTICERCOSIS. JE SHOULD BE CONSIDERED IN THE DIFFERENTIAL DIAGNOSIS FOR ANY PATIENT WITH AN ACUTE NEUROLOGIC INFECTION WHO RECENTLY HAS BEEN IN A JEV-ENDEMIC COUNTRY. TRAVELERS TO JE-ENDEMIC COUNTRIES SHOULD BE ADVISED OF THE RISK FOR JE AND THE IMPORTANCE OF PERSONAL PROTECTIVE MEASURES TO PREVENT MOSQUITO BITES.2 JEV VACCINE SHOULD BE CONSIDERED FOR TRAVELERS WHO MIGHT BE AT GREATER RISK BASED ON THE SEASON, LOCATION, AND DURATION OF THEIR VISIT AND THEIR PLANNED ACTIVITIES.

Case Reports
Case 1

On July 18, 2010, a previously healthy girl aged 11 years was hospitalized in Nevada after 2 days of fever, headache, nau-
sea, vomiting, and neck pain. During June 21–July 12, she had visited the Philippines with four relatives and had received numerous mosquito bites. Two of the relatives were born in the Philippines; the patient and her parents (who did not accompany her on the trip) were born in the United States. The girl had no history of JE vaccination and neither she nor her travel companions sought pretravel health advice. The travelers spent most of their time in Metro Manila, staying with relatives in a screened house in a compound in urban Quezon City. They took day trips on four occasions to coastal and rural destinations within a few hours' drive of Manila. They also took a 2-night trip to a resort on an island where they slept in air-conditioned, screened accommodations. While at the resort, they walked on the beach one evening.

On admission, the patient had fever (103.0°F [39.4°C]) and a peripheral white blood cell (WBC) count of 23,400/mm³ (normal: 4,500-13,500/mm³). Cerebrospinal fluid (CSF) showed pleocytosis (403 WBCs/mm³ [normal: 0-5/mm³]) with 80% neutrophils and 11% lymphocytes, slightly elevated protein (50 mg/dL [normal: 5-40 mg/dL]), and normal glucose concentrations. Healing insect bites were noted on examination. Initial management included intravenous antibiotics for presumed bacterial meningitis. The patient was alert and ambulatory until the evening of July 19, when she became somnolent and developed focal motor seizures. A computed tomography scan showed effacement of the cortical sulci. On July 20, she developed acute pulmonary edema, bradycardia, and hypotension and required mechanical ventilation. Her pupils became fixed and dilated and an electroencephalogram (EEG) showed little cerebral activity. She developed ventricular tachycardia and died July 21, 5 days after illness onset.

Formalin-fixed brain tissue collected at autopsy showed histopathologic changes indicative of meningoencephalitis, and positive immunohistochemical staining for JEV serocomplex group flavivirus antigens in multiple areas. JEV ribonucleic acid was identified in frozen brain tissue by reverse transcription—polymerase chain reaction using flavivirus consensus primers followed by nucleic acid sequencing. CSF collected on July 18 tested positive for JEV-specific immunoglobulin M (IgM) and neutralizing antibodies. Tests for other viral, bacterial, and fungal causes of meningitis and encephalitis were negative.

**Case 2**

On July 14, 2010, a boy aged 6 years was hospitalized in Texas with fever, somnolence, headache, vomiting, and refusal to walk. His illness had commenced 2 days earlier while en route to the United States from a refugee camp in northwest Thailand, where he had resided since being born there to parents from Burma. In the camp, he had lived in communal housing. Mosquito nets were available but not used regularly. Pigs were kept within the grounds of the camp, and rice fields were nearby. The boy reportedly had received childhood vaccinations in Thailand, where JE vaccine is part of the routine immunization schedule, but no records confirming his receipt of JE vaccine were available.

On admission to the hospital in Texas, the patient had fever (104.5°F [40.3°C]) and nuchal rigidity. His peripheral WBC count was 25,900/mm³ with 87% neutrophils and 6% band-forms. CSF showed a WBC count of 600/mm³ with 87% neutrophils, slightly elevated protein (52 mg/dL), and normal glucose concentrations. Magnetic resonance imaging (MRI) of the brain with contrast showed a lesion in the left frontal lobe, consistent with neurocysticercosis, and abnormal signal in the left thalamus.

During the next 2 days, the patient developed reduced awareness and became nonverbal, with brief response only to his name and painful stimuli. No seizures were observed, and an EEG showed generalized slowing of cerebral activity but no seizure-related activity. On July 17, a repeat MRI also showed the left thalamic changes and abnormal signal around the lesion in the left frontal lobe. CSF collected the same day showed a WBC count of 55/mm³ with lymphocytic predominance (72%), slightly elevated protein (49 mg/dL), and normal glucose concentrations.

A coinfection was suspected because the boy’s clinical presentation was unusual for neurocysticercosis. CSF collected on July 17 (day 6 of illness) showed JEV-specific IgM and neutralizing antibodies. JEV neutralizing antibody titers increased more than fourfold between acute (day 3) and convalescent (day 19) serum samples. Cysticercosis serology on a serum sample was negative. CSF, blood, and urine bacterial cultures, CSF cryptococcal antigen testing, a malarial smear, dengue and human immunodeficiency virus serology, and respiratory viral testing on a nasopharyngeal aspirate also were negative.

The boy’s neurologic symptoms resolved during his 24-day hospitalization. He completed a 21-day course of albendazole with corticosteroid taper for neurocysticercosis. On discharge, he was active, alert, and walking and talking normally.

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**CDC Editorial Note:** JE is an uncommon but often serious disease in travelers to JE-endemic countries. These two JE cases represent the fifth and sixth cases identified in the United States since 1992.

The Philippines and Thailand are both recognized as JE-endemic countries. Information on the incidence and epidemiology of JE in Thailand is more comprehensive because JE surveillance has been conducted there since 1976. In the Philippines, JE studies have been conducted sporadically, but JE cases in the local population generally are unrecognized because JE surveillance is not conducted routinely and access to JE diagnostics is limited.
Nonetheless, JEV transmission in the Philippines is clearly evident; the case in this report is the sixth travel-associated case reported worldwide since 1986 in a person from a nonendemic country traveling to the Philippines. Therefore, lack of reported cases in the local population should not be assumed to indicate absence of disease. Concomitant JEV infection and neurocysticercosis is well-recognized in JEV-endemic countries. Neurocysticercosis is caused by the larval stage of the pork tapeworm, Taenia solium. Humans are the host for the adult T. solium tapeworm, and neurocysticercosis is acquired by ingesting eggs excreted by an intestinal tapeworm carrier. Neurocysticercosis increases the risk for JEV neuroinvasive disease and might cause higher JE mortality rates. With coinfection, JE-related neuroimaging abnormalities tend to be more prominent on the side of the brain where the most cysts, or the solitary cyst, are located. Thalamic changes on the same side as the cyst and suggestive of JE were noted in the boy (case 2) in this report. Negative cysticercosis serology, as occurred in this patient, is not uncommon with single cysts.

Case 1 of travel-associated JE occurred in a person of Asian origin (as did three of the most recent JE cases in U.S. travelers) who was visiting relatives in the Philippines. Travelers returning to their country of origin to visit friends and relatives are typically at greater risk than most tourists for travel-related infections but infrequently seek pretravel health advice. This limits their opportunity to receive information and counseling on ways to reduce their risk for acquiring diseases during travel. Such risks might be reduced through targeted outreach to educate travelers who will be visiting friends and relatives about potential health risks and prevention methods, including immunizations.

The Advisory Committee on Immunization Practices recommends that all travelers to JE-endemic countries be informed of the risks for JE and use personal protective measures to reduce the risk for mosquito bites. JE vaccine is recommended for some travelers who will be in a high-risk setting. JE should be considered in the differential diagnosis for any patient with an acute neurologic syndrome returning from a JE-endemic country.