



# United States epidemiology of hepatitis A: influenced by immigrants visiting friends and relatives in Mexico?

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Among the industrialized nations, the United States annually receives the greatest number of immigrants as permanent residents. Immigrants from Mexico have represented the largest segment of the foreign-born population in recent decades, and continued growth of Mexican immigration is predicted for the decades ahead. The changing demographics of this population, including the emergence of new immigrant growth centers, will influence the future epidemiology of hepatitis A virus transmission in the United States. Travel home to the place of origin to visit friends and relatives (VFR) by both newly arrived and established Mexican immigrants constitutes a new group of travelers that now include intergenerational family units. Asymptomatic pediatric travelers—who acquire hepatitis A abroad and are infectious on return to American communities—contribute to the silent transmission of hepatitis A to playmates, caretakers, and contacts in households, daycare facilities, and elementary schools. Considering the expanded geographic distribution of Mexican immigrant settlement, the predicted increased diversity of pediatric populations in the United States over time, and the continued growth of VFR travel, a universal pediatric vaccine recommendation for hepatitis A immunization can help to prevent hepatitis A transmission in this country in the future.

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Historically, the United States has been considered a country of low endemicity for transmission of hepatitis A, meaning that the overall national average was reported at approximately 10 cases per 100,000 population in the period from 1987 to 1997 (**Figure 1**).<sup>1</sup> After hepatitis A vaccines became available (Havrix, GlaxoSmithKline, Research Triangle Park, NC, in 1995 and Vaqta, Merck & Co., Inc., Whitehouse Station, NJ, in 1996), the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) developed recommendations for vaccination that targeted specific groups at risk. These target groups included persons traveling to or working in countries that have a high or moderate endemicity of hepatitis A infection, children in communities that

have high rates of hepatitis A and periodic hepatitis A outbreaks, men who have sex with men, illegal drug users, persons who have occupational risk for infection, persons who have chronic liver disease, and persons who have clotting-factor disorders.<sup>2</sup> However, immediately following its release, the hepatitis A vaccine was not recommended for incorporation into the standard pediatric or adult immunization schedules.

The influence of immigration and international travel on the transmission of communicable diseases within the United States has been recognized throughout its national history. The spread of smallpox, measles, and typhus to Native American populations during the exploration of the New World, immigration of settlers from the Old World, and the expeditions of the western territories created epidemics and increased mortality in nonimmune populations.<sup>3</sup> Ever since, subsequent waves of immigrants, refugees, seasonal migrant workers, and even international adoptees

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**Figure 1** Geographic distribution of hepatitis A virus (HAV) infection for the decade ending in 1997. Low endemicity for transmission of HAV means  $\leq 10$  cases per 100,000 population. This map generalizes available data, and patterns may vary within countries. Anti-HAV = antibodies to HAV. (Reproduced from *MMWR Recomm Rep*.<sup>1</sup>)

have been associated with importation and transmission of tuberculosis, hepatitis B, intestinal parasitic infections, sexually transmitted infections, and other communicable diseases in receiving communities.<sup>4–13</sup> In the latter half of the 20th century, large groups of immigrants from Latin America and Asia began to outnumber the earlier groups of immigrants from Europe.

The intent of this article is to look at the unique regional epidemiology of hepatitis A in the United States reported in the decade 1987 to 1997, to explore the impact of newly arriving immigrants and seasonal migrant workers from Mexico on the regional epidemiology of hepatitis A, and to show that the visiting of friends and relatives (VFR) in their place of origin by newly arrived and established US residents from Mexico may contribute to continued hepatitis A transmission in the United States in the future.

## Observations on foreign-born persons living in the United States

The population of foreign-born persons living in the United States began a steady rise in the 1980s, increasing from approximately 9 million to the approximately 32.5 million foreign-born US citizens cited by the March 2002 census.<sup>14</sup> Of these, the largest number, 9.8 million (30%) originated in Mexico, followed by 8.5 million (26%) from Asia, and 7.3 million (23%) from the rest of Latin America exclusive of Mexico. In addition, 5.4 million (17%) came from Europe and Canada, 1.4 million (4%) came from the Philippines, and 1.4 million (4%) came from Africa and the remaining countries.<sup>15</sup> These data suggest that the majority of the foreign-born populations in the United States origi-

nated in countries considered highly endemic for hepatitis A (Figure 1).

Newly arrived immigrants and settled immigrants who have the desire and means to visit friends and families in their country of origin represent a population of new travelers. Since 1965, the majority of immigrants entering the United States have primarily entered through the 1,951-mile border between this country and Mexico. This contrasts with the immigration pattern of earlier decades, when the large immigrant populations arrived mainly by boat, with some arriving via air travel.<sup>16</sup> The significance of this is that immigrant travel back to the place of origin—in Mexico—is more accessible as an overland journey than by boat or airplane.

In addition to the officially surveyed immigrants, it is estimated that there are approximately 9.3 million undocumented foreign-born persons living in the United States, with approximately 57% (5.3 million) of this group composed of undocumented Mexican immigrants.<sup>15</sup> There are also an estimated 2 million seasonal workers who travel yearly from Mexican homes to US work sites, bringing the total number of potential travelers to  $>17$  million crossing the border between the United States and Mexico on a regular basis.<sup>17</sup>

The magnitude of the estimate for cross-border travel is comparable to tourism data for inbound travelers to Mexico. In 1995, documented tourist arrivals in Mexico from North America showed that 19,142,000 (94.9%) were from the United States, 445,000 (2.2%) from Central and South America, and 197,000 (1%) from Canada.<sup>18</sup> These data show that tourism to Mexico from the United States is abundant, and it is plausible that US residents VFR contributed significantly to the recorded

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