Country of birth of children with diagnosed HIV infection in the United States, 2008–2014

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Abstract

Background.—Diagnoses of HIV infection among children in the United States (US) have been declining; however, a notable percentage of diagnoses are among those born outside the United States. The impact of foreign birth among children with diagnosed infections has not been examined in the United States.

Method.—Using the CDC National HIV Surveillance System, we analyzed data for children aged <13 years with diagnosed HIV infection ("children") in the United States (reported from 50 states and the District of Columbia) during 2008–2014, by place of birth and selected characteristics.

Results.—There were 1,516 children (726 US-born [47.9%] and 676 foreign-born [44.6%]). US-born children accounted for 70.0% in 2008, declining to 32.3% in 2013, and 40.9% in 2014. Foreign-born children have exceeded US-born children in number since 2011.

Age at diagnosis was younger for US-born than foreign-born children (0–18 months: 72.6% vs. 9.8%; 5–12 years: 16.9% vs. 60.3%). HIV diagnoses in mothers of US-born children were made more often before pregnancy (49.7% vs 21.4%), or during pregnancy (16.6% vs 13.9%), and less often after birth (23.7% vs 41%). Custodians of US-born children were more often biological

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parents (71.9% vs 43.2%), and less likely to be foster or non-related adoptive parents (10.4% vs 55.1%).

Of 676 foreign-born children with known place of birth, 65.5% were born in sub-Saharan Africa and 14.3% in Eastern Europe. The top countries of birth were Ethiopia, Ukraine, Uganda, Haiti, and Russia.

Conclusion.—The increasing number of foreign-born children with diagnosed HIV infection in the United States requires specific considerations for care and treatment.

Keywords

HIV; children; country of birth; natality; United States

Introduction

The numbers of perinatal HIV infections continue to decline in nearly all highly resourced countries, including the United States (US).[1–3] Despite these declines, in the past decade a number of highly resourced countries have reported among their HIV-exposed and HIV-infected populations increasing percentages of children born in less-resourced countries, notably sub-Saharan Africa (SSA).[4–9] During 2007–2011, of the children aged <13 years in the United States with diagnosed HIV infection, 33% were born outside the United States[10] and of these, 62% were born in Africa. As of January 2010, the HIV immigration exclusion was lifted in the United States,[11] and HIV was no longer included in the list of screening tests recommended for immigration.[12] To better understand the contribution of birthplace to the epidemiology of diagnosed HIV infection among children, we analyzed data from the National HIV Surveillance System (NHSS) of the Centers for Disease Control and Prevention (CDC).

Methods

We analyzed data from NHSS reported to CDC through June 2016 for children aged <13 years with diagnosed HIV infection in the United States during 2008–2014, by place of birth and selected characteristics. Data were reported from 50 states and the District of Columbia. A minimum of 18 months delay was allowed for the reporting of deaths to NHSS.

As part of NHSS, surveillance jurisdictions collect data on persons with diagnosed HIV infection in accordance with state and territorial laws and report the data to CDC without personal identifying information. New cases of HIV infection among children are identified through active follow-up of HIV-infected pregnant women and HIV exposed infants, in conjunction with case reporting through providers and laboratory reporting of HIV-related test results. An HIV diagnosis is based on the earliest laboratory or physician-documented report associated with confirmed HIV infection, following the US HIV surveillance case definition.[13] Case information is collected on standardized case report forms, which are completed by providers or through active follow-up by health department staff (i.e., abstracting data from medical records at reporting facilities).[14]

This report only includes those children with a residence in the United States and the District of Columbia at the time of HIV diagnosis. This includes children who may have had an earlier diagnosis in another country, but who lacked laboratory or physician-documented evidence of the earlier diagnosis in the other country. Birthplace information was available for 92.5% of persons included in this analysis. We defined US-born as children who were born in the 50 states, the District of Columbia, or a US dependent area (American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the US Virgin Islands). For this analysis, the only US dependent area that had children with HIV infection diagnosed in the 50 states and the District of Columbia was Puerto Rico. We defined foreign-born as children with a known place of birth outside of the 50 states, the District of Columbia, and the US dependent areas. The date of immigration to the United States and current age at immigration are not collected through NHSS.

Determination of age was based on the child's age at the date of the first documented HIV diagnosis in the United States. For foreign-born children included in the analysis who may have had an earlier diagnosis in another country but who lacked laboratory or physician-documented evidence of the earlier diagnosis, their age represents age at first documented diagnosis in the United States. Data on child's race was classified according to the minimum categories specified by the 1997 Office of Management and Budget Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity[15]. Children of Hispanic/Latino ethnicity can be of any race.[15] Transmission category was classified as perinatal or other/unknown (other includes hemophilia, blood transfusion, and other confirmed risk factor; unknown includes risk factor not reported or not identified). Of the children included in this analysis who had diagnosed HIV infections attributed to other/unknown, 97.4% had no identified risk. All comparisons are between US-born and foreign-born children, unless stated otherwise. Because of the high percentage of missing data for many of the characteristics, particularly among foreign-born infants and their mothers, for comparison, percentages were calculated based on cases with available information. In a few instances, the results include data not shown in Table 2 (e.g., data on children with diagnosed HIV infection whose transmission category was classified as other/unknown).

Results

During 2008–2014, there were 1,516 children aged <13 years with diagnosed HIV infection (hereafter referred to as "children") in 50 states and the District of Columbia (Table 1), of whom 726 (47.9%) were US-born, 676 (44.6%) were foreign-born, and 114 (7.5%) had unknown or missing place of birth. A 26.7% decrease was seen in the annual number of children with diagnosed HIV infection in 50 states and the District of Columbia from 240 in 2008 to 176 in 2014.

The number of US-born children with diagnosed HIV infection decreased 57.1% from 2008–2014; the number of US-born children with perinatally acquired HIV infection followed a similar pattern, with a 60.1% decline. US-born children accounted for 70.0% of all children with diagnosed HIV infection in 2008, declining to a low of 32.3% in 2013 (Table 1). The overall number of foreign-born children increased annually (except during 2011) through 2012 (n=147) and then declined in 2013 and 2014; the number of foreign-

born children with perinatally acquired HIV infection followed a similar pattern. The numbers of US-born and foreign-born children were nearly equal in 2011 (89 and 94, respectively). Since 2011, among all children, the numbers of foreign-born have always exceeded those of US-born.

Overall, the percentage with missing place of birth information remained fairly small throughout the study period (5.4% in 2008 and 10.8% in 2014). Among all children, those with a transmission category of other/unknown (1) always had a higher proportion of foreign-born than US-born, (2) never constituted less than 22.4% of foreign-born children, and (3) increased in their percent of foreign-born children through 2011, declining slightly thereafter.

Table 2 shows clinical characteristics of children with diagnosed perinatally acquired HIV infection and known place of birth. All comparisons are between US-born and foreign-born children, unless stated otherwise. Because of the high percentage of missing data for many of the characteristics, particularly among foreign-born infants and their mothers, for comparison, percentages were calculated based on cases with available information. In a few instances, the results include data not shown in Table 2 (e.g., data on children with diagnosed HIV infection whose transmission category was classified as other/unknown).

The age at which the children received their HIV diagnosis was younger for US-born children (0–18 months, 72.6%; 5–12 years, 16.9%), compared with foreign-born children (0–18 months, 9.8%; 5–12 years, 60.3%). Among US-born and foreign-born children, children whose transmission category was classified as other/unknown received their diagnosis at older ages (5–12 years: US-born, 47.4%; foreign-born, 51.8% [data not shown in Table 2]).

Black/African American race predominated in both US-born (62.9%) and foreign-born (68.8%); white race was reported slightly less often among US-born (9.4%) than foreign-born (13.7%). In contrast, Hispanic/Latino was the second-most frequent racial/ethnic identification among US-born children (18.0%), but among foreign-born, Asian race (7.4%) was more frequent than Hispanic/Latino (6.5%) ethnicity. Similarly, among foreign-born children whose transmission category was classified as other/unknown, Asian race was 7.0%, and Hispanic/Latino ethnicity was 1.9% (data not shown in Table 2).

Among mothers of US-born children with known timing of maternal HIV diagnosis, diagnosis was before the pregnancy in 49.7%, during pregnancy in 16.6%, and after birth in 23.7%. In contrast, among mothers of foreign-born children with data available (n=173), maternal HIV diagnosis was made before pregnancy in 21.4%, during pregnancy in 13.9%, and after delivery in 41.0%. Among US-born children, 48.2% did not have information on mother's prenatal care (PNC). Among those with information on mother's prenatal care, 77.7% of mothers had at least one PNC visit; among those whose mothers had any prenatal care, 62.4% of mothers began care before the third trimester. Data on PNC was available for <2% of mothers of foreign-born children. Among US-born children with antiretroviral (ARV) medication use information, 51.8% of their mothers had received ARVs prenatally, 19.8% of their mothers had received ARVs during labor and delivery; 100% of infants had

received ARVs neonatally. The use of ARVs prenatally, natally, and postnatally only occurred in 9.5% of mother-infant pairs with known ARV use information. In contrast, for foreign-born children and their mothers, data on ARV use was available in 7–12% (the available data usually showed that no prenatal or natal ARV were used). Data on breastfeeding was missing from many mothers of US-born (34.2%) and foreign-born (90.7%) children, but among those with data, breastfeeding was reported by mothers of 13.6% of US-born and 65.1% of foreign-born children. Data for mother's place of birth was missing for 22.2% of US-born and 61.8% of foreign-born children. Among mothers of US-born children with available data (n=498), 80% were born in the United States or a US dependent area, and 20% were born elsewhere, while <1% of mothers of foreign-born children were born in the United States.

Medicaid or other public funds were the payer source for 82.4% of US-born children. Though data on medical payer status was missing for 75.3% of foreign-born, among those with data (n=112), 64% reported private coverage, and 29.8% had Medicaid or other publically funded payer source.

At the time of diagnosis, US-born children resided predominantly in the South (57.1%), in contrast to foreign-born children, among whom residence was more widely and evenly distributed: South (30.8%), Midwest (27.8%), and West (29.5%) and Northeast (11.9%). . For those with information on facility of diagnosis (461 US-born; 394 foreign-born), a greater percentage of the US-born children had HIV infections diagnosed in inpatient facilities (51.2%) than outpatient facilities (44.9%), in contrast to the foreign-born children, among whom HIV infections were diagnosed less frequently in inpatient facilities (19.0%) than outpatient facilities (72.3%). Children whose transmission category was classified as other/unknown showed a similar pattern: US-born children had slightly more HIV infections diagnosed in inpatient facilities (36.6%) than outpatient (33.1%), and foreign-born children had infections diagnosed less often in inpatient facilities (19.8%) than outpatient facilities (57.8%) (data not shown).

Among children with information on child's primary caretaker, biological parents were more often the custodian among US-born (71.9%) than among foreign-born (34.2%) children, though the percentage where the custodian was another relative (or a related foster or adoptive parent) was similar (US-born, 11.9%; foreign-born, 10.4%). In contrast, custody was with a foster or non-related adoptive parent for 10.4% of US-born, but for a majority (55.1%) of foreign-born children.

The region of birth for the 676 children born outside the United States but with HIV diagnosed within the United States from 2008–2014 is shown in Table 3 (data are not shown for individual countries). Of these children, 443 (65.5%) were born in SSA (note that Sudan is considered SSA). Approximately half of the 676 were born in East Africa, of whom 69.1% were born in Ethiopia, followed by 14.4% from Uganda. There were 51 children from West Africa (7.5%), with Nigeria and Ghana accounting for 35.3% and 33.3%, respectively; there were 33 from Middle Africa (4.9%), of whom 51.5% were from Congo and 24.2% were from Cameroon. Eastern Europe accounted for 14.3% of non US-born children (68.0% of whom were from Ukraine, and 28.9% from the Russian Federation); these two former

republics of the Soviet Union, along with Latvia, accounted for 98.9% of Eastern European children, and with Uzbekistan (counted as South Central Asia), accounted for 15.2% of the foreign-born children. The countries with the highest numbers of children with diagnosed HIV infection during 2008–2014 were: Ethiopia, 235; Ukraine, 66; Uganda, 49; Haiti, 31; Russia, 28; Nigeria, 18; Ghana, 17; Congo, 17; South Africa, 16; Burma (Myanmar), 14; Kenya, 13; China, 13, and Mexico, 12.

Discussion

During the period 2008–2014 in the United States, the overall number of children aged <13 years with diagnosed HIV infection declined significantly, with an even larger percentage decline in the number of US-born children with diagnosed HIV. Concurrently, there was an increase—at least up until the last couple of years of the observation period—in the annual number and percentage of foreign-born children with diagnosed HIV infection. The increase in foreign-born children appears to have begun prior to January 2010, when the HIV immigration exclusion was lifted.[11] Notably, of the foreign-born children diagnosed with HIV in the US in this study, 55% were in non-familial foster or adoptive custody. We are not able to determine how many of these children entered the country under a waiver of the HIV immigration restriction which was rescinded in 2010. The US regions in which foreign-born children reside reflect the regions of the United States which receive the largest numbers of immigrants in general.[16] In our study, half of the foreign-born children with diagnosed HIV infection were born in East Africa, mainly Ethiopia, but it is notable that three of the top five countries of birth for foreign-born children were not in Africa.

The increasing contribution of foreign-born children to the HIV epidemic in the United States is significant for several reasons. Focusing on perinatal transmissions that occur in the United States allows a more accurate perspective on the effectiveness of domestic prevention programs. Beyond those considerations, however, are those which relate specifically to the issues of HIV-infected infants and children who immigrate to the United States with their families. It has yet to be examined whether these children are linked to and maintained in care at rates different from US-born children. Experience in Canada has suggested that a multicultural approach and more case-management might be necessary.[8]

Another significant consideration is the diagnosis of HIV infections among children who immigrate with their parents who might have undiagnosed HIV infection. Diagnostic nucleic acid tests widely available in North America (e.g., Roche Amplicor 1.5 HIV DNA PCR), where HIV subtype B predominates, appear to detect with comparable sensitivity and specificity other subtypes that circulate in SSA, specifically, subtype C,[17–20] subtypes A and D,[20] and subtype CRF01_AE in Southeast Asia.[21] Despite the utility of the nucleic acid tests presently in use, pediatricians in the United States will need to consider that the optimal time for such testing will differ for children who have breastfed as infants in Africa or who continue to breastfeed once they have arrived in the United States. In the present study, about two-thirds of foreign-born children with diagnosed HIV had breastfed, among those for whom information on breastfeeding was known. Even if HIV-exposed infants who immigrate here were tested in Africa, up to 70% of such infants drop out of care early.[22] As would be expected, children with perinatally acquired HIV infection in Africa are older at

the time of diagnosis than are infected children born in the United States.[23] Given the high loss to follow-up of HIV-exposed infants in SSA[24], we should consider the possibility that HIV-exposed infants born elsewhere who move here at very young ages might not yet have undergone sufficient diagnostic testing to rule out HIV infection. In the present study, HIV in foreign-born children was diagnosed at older ages than in US-born. In addition to the attributes of foreign-born children just noted (higher rate of breastfeeding, older age at time of diagnosis), other differences between US-born and foreign-born children were evident. Fewer mothers of foreign-born children had HIV diagnosed before pregnancy, and more after delivery. Medical coverage was more often by private insurance, probably reflecting the higher percent of foreign-born who were adopted. The clinical setting differed in which the HIV diagnosis was made. The fact that more foreign-born children had HIV diagnosed in outpatient facilities (61.4%) probably reflects the older age of these children, which might correlate with a better degree of clinical stability; in contrast, the higher percent of US-born children had HIV diagnosed in inpatient facilities, which might correlate with diagnosis when hospitalized for an illness associated with HIV infection, e.g., *Pneumocystis jirovecii* pneumonia.

The percentage of foreign-born children with HIV infection diagnosed in the 50 states and the District of Columbia in this study is higher than the percentage of HIV-exposed and HIV-infected children born outside of the United States in CDC's Enhanced Perinatal Surveillance (EPS), 14% during 2000–2003[25] and 13% during 2005–2008.[26] EPS was conducted in a subset of states, and did not include several of the states to which large numbers of immigrants gravitate (NV, HI and MA were not in EPS and EPS covered only a few counties in southern CA).

Similar to what has been observed for our analysis, in the past decade, high percentages of foreign birth have been reported among children with diagnosed HIV in several European countries. In Denmark, up to July 2003, 58.5% of HIV-infected children had been born in SSA.[4] During 1996–2012 in the Netherlands, 43% of HIV-infected children had been born in SSA[5]; children born in SSA had HIV diagnosed at a median 2.9 years of age, in contrast with 1.1 years among children of Dutch origin. Among children with diagnosed HIV infection in Paris during 2000–2005, 39/59 (66.1%) were born outside of France, 27/39 (69.2%) in SSA.[6] In 27 countries of the European Union (plus Norway and Iceland), of 57 persons whose HIV infection was attributed to mother-to-child transmission during 1996–2006, 23% had been born in SSA.[7] Through 2006, in UK and Ireland, of 1441 HIV-infected reported to the National Study of HIV in Pregnancy and Childhood and the Collaborative HIV Paediatric Study, 664 (46%) had been born elsewhere, of whom 564/1441 (39%) had been born in Africa.[9] Higher-resource countries are also reporting high, and in some cases increasing, percentages of foreign-birth among HIV-infected women delivering infants. The number of HIV-infected women giving birth who were themselves born in another country has increased: in France, from 12% in the early-mid 1980's to 45.4% in the mid-late 1990's to 64% in 2003–2004;[27] in Italy, from 12% to 26% during the period from the mid—1980's to 2005;[28] and in UK/Ireland from 43.5% in the early 1990's to 78.6% in 2004–2005.[1]

Immigration and international travel have a significant role in the epidemiology of several other infectious diseases in the United States. The most notable example is tuberculosis, for

which cases in immigrants have constituted a majority since 2001,[29] reaching 66% in 2014.[30] Hepatitis B has been more prevalent among immigrants than US-born persons for many years; during 1999–2006, overall prevalence among foreign-born was 12.2% (95%CI, 10.7–13.9%) and among US-born persons was 3.5% (95%CI, 3.1–3.8%).[31] As cases of rubella declined in the years just prior to its elimination in the Western Hemisphere, foreign-born persons accounted for 79% of cases in 1998 and 65% of cases in 1999, with 50% during 2001–2004.[32]. Similarly, among measles cases occurring since 2001, 88% were internationally imported.[33]

There are several limitations to our study. The NHSS does not include data on the date of entry into the United States, so we were not able to relate any of our variables to citizenship status or an individual's time in the country. The greater proportion of missing data among the foreign-born vs. US-born makes it difficult to assess certain characteristics for the foreign-born. In addition, we were not able to analyze linkage to care among US-born and foreign-born children with diagnosed HIV infection. The marker for linkage to care is a record of at least one CD4 T-lymphocyte (CD4) or viral load test performed 1 month or 3 months after diagnosis, and was available only in a subset of jurisdictions during the study period, making the data insufficient as a basis for comparison. Finally, this report only includes those children with a US residence at the time of HIV diagnosis, as those residing in the United States but born and HIV-diagnosed abroad are excluded.

The numbers and percentages of foreign-born children with diagnosed HIV infection in the United States have exceeded those of US-born children for several years. It is unknown how long this discrepancy will continue, but it is clear from our data that further attention will need to be paid to issues such as linkage to and retention in HIV care among HIV-infected children born abroad. In addition, as more HIV-infected women immigrate to the United States, new issues may arise related to prevention of perinatal transmission, such as innate resistance of HIV-2, diminished sensitivity of nucleic acid tests commonly used for diagnosis, and awareness of transmission risks related to breastfeeding.

Acknowledgments

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Table 1.

Diagnoses of HIV infection among children <13 years of age, by place of birth and HIV transmission category —50 states and the District of Columbia, 2008–2014

	2008 No. (%)	2009 No. (%)	2010 No. (%)	2011 No. (%)	2012 No. (%)	2013 No. (%)	2014 No. (%)	Total No. (%)
US-born								
Perinatal	148 (88.1)	132 (93.6)	104 (89.7)	81 (91.0)	74 (93.7)	52 (85.2)	59 (81.9)	650 (89.5)
Other[a]/Unknown[b]	20 (11.9)	9 (6.4)	12 (10.3)	8 (9.0)	5 (6.3)	9 (14.8)	13 (18.1)	76 (10.5)
Subtotal	168 (70.0)	141 (60.8)	116 (49.2)	89 (44.3)	79 (32.6)	61 (32.3)	72 (40.9)	726 (47.9)
Foreign-born								
Perinatal	42 (71.2)	59 (75.6)	73 (70.9)	58 (61.7)	93 (63.3)	70 (63.6)	66 (77.6)	461 (68.2)
Other[a]/Unknown[b]	17 (28.8)	19 (24.4)	30 (29.1)	36 (38.3)	54 (36.7)	40 (36.4)	19 (22.4)	215 (31.8)
Subtotal	59 (24.6)	78 (33.6)	103 (43.6)	94 (46.8)	147 (60.7)	110 (58.2)	85 (48.3)	676 (44.6)
Unknown/Missing								
Perinatal	10 (76.9)	3 (23.1)	11 (64.7)	8 (44.4)	7 (43.8)	5 (27.8)	10 (52.6)	54 (47.4)
Other[a]/Unknown[b]	3 (23.1)	10 (76.9)	6 (35.3)	10 (55.6)	9 (56.3)	13 (72.2)	9 (47.4)	60 (52.6)
Subtotal	13 (5.4)	13 (5.6)	17 (7.2)	18 (9.0)	16 (6.6)	18 (9.5)	19 (10.8)	114 (7.5)
Total	**240 (100)**	**232 (100)**	**236 (100)**	**201 (100)**	**242 (100)**	**189 (100)**	**176 (100)**	**1,516 (100)**

Note: Data on diagnoses of HIV infection reflect the date of diagnosis (diagnosed by December 31, 2015; reported to CDC as of June 30, 2016), not the date of report to CDC.

[a]Other includes hemophilia, blood transfusion, and other confirmed risk factor.

[b]Unknown includes risk factor not reported or not identified.

[a,b]Of the children included in this analysis who had diagnosed HIV infections attributed to other/unknown, 97.4% had no identified risk.

Table 2.

Clinical characteristics of children <13 years of age in the United States with diagnosed perinatally acquired HIV infection and known place of birth, 50 states and the District of Columbia, 2008–2014

	US-born		Foreign-born		Total	
	No. (%)Perinatal	(%) Among non-missing	No. (%)Perinatal	(%) Among non-missing	No. (%)	(%) Among non-missing
Age at diagnosis						
0–18 months	472 (72.6)	72.6	45 (9.8)	9.8	517 (46.5)	46.5
19 months – 4 years	68 (10.5)	10.5	138 (29.9)	29.9	206 (18.5)	18.5
5–12 years	110 (16.9)	16.9	278 (60.3)	60.3	388 (34.9)	34.9
Missing	0 (0)	0	0 (0)	0	0 (0)	0
Subtotal (Non-missing)	650 (100)	100	461 (100)	100	1111 (100)	100
Child's Race						
American Indian/Alaska Native	4 (0.6)	0.6	0 (0)	0	4 (0.4)	0.4
Asian	8 (1.2)	1.2	34 (7.4)	7.4	42 (3.8)	3.8
Black/African American	409 (62.9)	62.9	317 (68.8)	68.8	726 (65.4)	65.4
Hispanic/Latino[a]	117 (18.0)	18.0	30 (6.5)	6.5	147 (13.2)	13.2
Native Hawaiian/Other Pacific Islander	0 (0)	0	2 (0.4)	0.4	2 (0.2)	0.2
White	61 (9.4)	9.4	63 (13.7)	13.7	124 (11.2)	11.2
Multiple races	51 (7.8)	7.8	15 (3.3)	3.3	66 (5.9)	5.9
Subtotal (Non-missing)	650 (100)	100	461 (100)	100	1111 (100)	100
Timing of maternal diagnosis						
Before pregnancy	296 (45.5)	49.7	37 (8.0)	21.4	333 (30)	43.3
During pregnancy	99 (15.2)	16.6	24 (5.2)	13.9	123 (11.1)	16.0
At delivery	44 (6.8)	7.4	9 (2.0)	5.2	53 (4.8)	6.9
Before infant's birth	16 (2.5)	2.7	32 (6.9)	18.5	48 (4.3)	6.2
After infant's birth	141 (21.7)	23.7	71 (15.4)	41.0	212 (19.1)	2.8
Subtotal (Non-missing)	596 (91.7)	100	173 (37.5)	100	769 (61.2)	100
Unknown/missing	54 (8.3)		288 (62.5)		342 (30.8)	
Prenatal Care (categories not mutually exclusive)						
Mother had ≥1 prenatal visit						
Yes	262 (40.3)	77.7	3 (0.7)	37.5	265 (23.9)	76.8

	US-born		Foreign-born		Total	
	No. (%)Perinatal	(%) Among non-missing	No. (%)Perinatal	(%) Among non-missing	No. (%)	(%) Among non-missing
No	75 (11.5)	22.3	5 (1.1)	62.5	80 (7.2)	23.2
Subtotal (Non-missing)	337 (51.8)	100	8 (1.7)	100	345 (31.1)	100
Unknown/missing	313 (48.2)		453 (98.3)		766 (68.9)	
Began prenatal care before 3rd trimester						
Yes[b]	194 (29.8)	62.4	2 (0.4)	50.0	196 (17.6)	62.2
No, care began during 3rd trimester[c]	49 (7.5)	15.9	0 (0)	0	49 (4.4)	15.6
No prenatal care during pregnancy	68 (10.5)	21.9	2 (0.4)	50.0	70 (6.3)	22.2
Subtotal (Non-missing)	311 (47.8)	100	4 (0.9)	100	315 (28.4)	100
Unknown/missing	339 (52.2)		457 (99.1)		796 (71.6)	
Antiretroviral Use (categories not mutually exclusive)						
Mother received prenatal ARVs						
Yes	221 (34.0)	51.8	4 (0.9)	7.8	225 (20.3)	47.1
No	206 (31.7)	48.2	47 (10.2)	92.2	253 (22.8)	52.9
Subtotal (Non-missing)	427 (65.7)	100	51 (11.1)	100	478 (43.0)	100
Unknown/missing	223 (34.3)		410 (88.9)		633 (57.0)	
Mother received ARV in L&D						
Yes	70 (10.8)	19.8	3 (0.7)	5.5	73 (6.6)	17.8
No	284 (43.7)	80.2	52 (11.3)	94.5	336 (30.2)	82.2
Subtotal (Non-missing)	354 (54.5)	100	55 (11.9)	100	409 (36.8)	100
Unknown/missing	296 (45.5)		406 (88.1)		702 (63.2)	
Child received ARVs for prevention						
Yes	363 (55.8)	100	33 (7.2)	100	396 (35.6)	100
No	0 (0)	0	0 (0)	0	0 (0)	0
Subtotal (Non-missing)	363 (55.8)	100	44 (7.2)	100	396 (35.6)	100
Unknown/missing	287 (44.2)		428 (92.8)		715 (64.4)	
Child received prenatal ARV and L&D and post-partum						
Yes	48 (7.4)	9.5	1 (0.2)	1.1	49 (4.4)	8.3
No	325 (50.0)	63.6	55 (11.9)	63.2	380 (34.2)	64.4
Mother received ARVs prenatally or at L&D or child received ARVs	130 (20.0)	25.8	31 (6.7)	35.6	161 (14.5)	23.3

	US-born		Foreign-born		Total	
	No. (%)Perinatal	(%) Among non-missing	No. (%)Perinatal	(%) Among non-missing	No. (%)	(%) Among non-missing
Subtotal (Non-missing)	503 (77.4)	100	87 (18.9)	100	590 (53.1)	100
Unknown/missing	147 (22.6)		374 (81.1)		521 (46.9)	
Child's payer status						
Medicaid/ Other Public Fund	243 (37.4)	82.4	34 (7.4)	29.8	277 (24.9)	67.7
No Coverage	17 (2.6)	5.8	3 (0.7)	2.6	20 (1.8)	4.9
Private Coverage	32 (4.9)	10.8	73 (15.8)	64.0	105 (9.5)	25.7
Other	3 (0.5)	1.0	4 (0.9)	3.5	7 (0.6)	1.7
Subtotal (Non-missing)	295 (45.4)	100	114 (24.7)	100	409 (36.8)	100
Unknown/missing	355 (54.6)		347 (75.3)		702 (63.2)	
Child was breastfed						
Yes	58 (8.9)	13.6	28 (6.1)	65.1	86 (7.7)	18.3
No	370 (56.9)	86.4	15 (3.3)	34.9	385 (34.7)	81.7
Subtotal (Non-missing)	428 (65.8)	100	43 (9.3)	100	471 (42.4)	100
Unknown/missing	222 (34.2)		418 (90.7)		640 (57.6)	
Mother's place of birth						
US/US-dependency born	405 (62.3)	80.0	1 (0.2)	0.6	406 (36.5)	59.5
Non-US born	101 (15.5)	20.0	175 (38.0)	99.4	276 (24.8)	40.5
Subtotal (Non-missing)	506 (77.8)	100	176 (38.2)	100	682 (61.4)	100
Unknown/missing	144 (22.2)		285 (61.8)		429 (38.6)	
Region of US residence at diagnosis						
Northeast	135 (20.8)	20.8	55 (11.9)	11.9	190 (17.1)	17.1
Midwest	95 (14.6)	14.6	128 (27.8)	27.8	223 (20.1)	20.1
South	371 (57.1)	57.1	142 (30.8)	30.8	513 (46.2)	46.2
West	49 (7.5)	7.5	136 (29.5)	29.5	185 (16.7)	16.7
Child's primary caretaker						
Biological parent(s)	368 (56.6)	71.9	108 (23.4)	34.2	476 (42.8)	57.5
Other relative or relative Foster/Adoptive parent	61 (9.4)	11.9	33 (7.2)	10.4	94 (8.5)	11.4
Foster/Adoptive parent, unrelated	53 (8.2)	10.4	174 (37.7)	55.1	227 (20.4)	27.4
Social service agency	26 (4.0)	5.1	1 (0.2)	0.3	27 (2.4)	3.3

	US-born		Foreign-born		Total	
	No. (%)Perinatal	(%) Among non-missing	No. (%)Perinatal	(%) Among non-missing	No. (%)	(%) Among non-missing
Other (specified in comments)	4 (0.6)	0.8	0 (0)	0	4 (0.4)	0.5
Subtotal (Non-missing)	512 (78.8)	100	316 (68.5)	100	828 (74.5)	100
Unknown/Missing	138 (21.2)		145 (31.5)		283 (25.5)	
Facility of diagnosis						
Inpatient facility[d]	236 (36.3)	51.2	75 (16.3)	19.0	311 (28.0)	36.4
Outpatient facility	207 (31.8)	44.9	285 (61.8)	72.3	492 (44.3)	57.5
Screening/Diagnostic/Referral	7 (1.1)	1.5	15 (3.3)	3.8	22 (2.0)	2.6
Laboratory	0 (0)	0	3 (0.7)	0.8	3 (0.3)	0.4
Other	11 (1.7)	2.4	16 (3.5)	4.1	27 (2.4)	3.2
Subtotal (Non-missing)	461 (70.9)	100	394 (85.5)	100	855 (77.0)	100
Unknown/Missing	189 (29.1)		67 (14.5)		256 (23.0)	
Total	650 (100)		461 (100)		1111 (100)	

Table 3.

Region of birth among children aged <13 years born outside the United States but diagnosed with HIV infection in the United States, by HIV transmission category—50 states and the District of Columbia, 2008–2014

	Perinatal	Other[a]/Unknown[b]	Total
	No. (%)	No. (%)	No. (%)
Caribbean	23 (5.0)	16 (7.4)	39 (5.8)
Central America /Mexico	18 (3.9)	3 (1.4)	21 (3.1)
South America	6 (1.3)	1 (0.5)	7 (1.0)
North America	1 (0.2)	0 (0)	1 (0.1)
Africa			
East	234 (50.8)	106 (49.3)	340 (50.3)
Middle	26 (5.6)	7 (3.3)	33 (4.9)
North	2 (0.4)	0 (0)	2 (0.3)
Southern	8 (1.7)	9 (4.2)	17 (2.5)
West	35 (7.6)	16 (7.4)	51 (7.5)
Subtotal Africa	305 (66.2)	138 (64.2)	443 (65.5)
Asia			
East	4 (0.9)	11 (5.1)	15 (2.2)
South Central	13 (2.8)	2 (0.9)	15 (2.2)
South East	23 (5.0)	6 (2.8)	29 (4.3)
Subtotal Asia	40 (8.7)	19 (8.8)	59 (8.7)
Eastern Europe	61 (13.2)	36 (16.7)	97 (14.3)
Other	1 (0.2)	0 (0)	1 (0.1)
Unknown/missing	6 (1.3)	2 (0.9)	8 (1.2)
Total	461 (100)	215 (100)	676 (100)

Note: Data on diagnoses of HIV infection reflect the date of diagnosis (diagnosed by December 31, 2015; reported to CDC as of June 30, 2016), not the date of report to CDC.

[a] Other includes hemophilia, blood transfusion, and other confirmed risk factor.

[b] Unknown includes risk factor not reported or not identified.