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Achieving Elimination of Perinatal HIV in the United States

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Abstract

In 2012, the Centers for Disease Control and Prevention published a Framework for Elimination of Perinatal Transmission of HIV in the United States in *Pediatrics*, setting the goals of an incidence of <1 case of perinatal HIV per 100 000 live births, and a perinatal transmission rate of <1%. We used National HIV Surveillance System data to monitor the numbers of perinatally acquired HIV cases among US-born persons and perinatal HIV diagnosis rates per 100 000 live births to approximate incidence. Perinatal HIV transmission rates from 2010 to 2019 were calculated by using estimates of live births to women with an HIV diagnosis from the National Inpatient Sample, Healthcare Cost and Utilization Project. The annual estimated number of live births to women with diagnosed HIV decreased from 4587 in 2010 to 3525 in 2019, and the number of US-born infants with perinatally acquired HIV decreased from 74 in 2010 to 32 in 2019. Annual perinatal HIV diagnosis rates declined from 1.9 to 0.9 per 100 000 live births, and perinatal HIV transmission rates declined from 1.6% to 0.9%. Racial and ethnic disparities in HIV diagnosis rates persisted but declined substantially over the 10-year period. Both diagnosis and transmission rate elimination goals were first achieved in 2019. To maintain the elimination of perinatal HIV, and to eliminate racial disparities, the continued coordinated effort of health care and public health is required. The approach to perinatal HIV elimination is a public health model that can be replicated or expanded to areas beyond HIV.

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In 2012, the Centers for Disease Control and Prevention (CDC) published *A Framework for Elimination of Perinatal Transmission of HIV in the United States*,[1] recognizing that interventions to maximally reduce the risk of perinatal transmission were widely available, and the annual number of infants with perinatally acquired HIV was steadily declining from a peak of ~1700 since the early 1990s.[1] The framework emphasized the vital roles of all sectors of health care and public health, particularly the importance of clinical care of persons of reproductive potential with HIV and perinatal HIV services coordination by public health. It included a 2-part goal for elimination: an incidence of <1 case of perinatal HIV per 100 000 live births and a perinatal HIV transmission rate of <1%.[1]

Cases of perinatally acquired HIV among persons born in the United States and perinatal HIV diagnosis rates per 100 000 live births are reported by year of birth and mother's race and ethnicity by the National HIV Surveillance System.[2] HIV incidence is not estimated for persons <13 years old; the diagnosis rate is used to approximate incidence. Perinatal HIV transmission rates from 2010 to 2019 were calculated by using estimates of live births to women with an HIV diagnosis from the National Inpatient Sample, Healthcare Cost and Utilization Project.[3] The annual estimated number of live births to women with diagnosed HIV ranged from 4587 in 2010[3] to 3525 in 2019, and the reported number of US-born infants with perinatally acquired HIV ranged from 74 in 2010 to 32 in 2019[2] (Fig 1, Table 1).

Annual perinatal HIV diagnosis and transmission rates from 2010 to 2019, overall and by race/ethnicity, are shown in Fig 2. With 32 perinatal HIV diagnoses, 2019 was the first year both diagnosis and transmission rate elimination goals were achieved. It is notable that <100 annual diagnoses of perinatal HIV were reported in the entire 10-year period. Annual perinatal HIV diagnosis rates declined from 1.9 to 0.9 per 100 000 live births, and perinatal HIV transmission rates declined from 1.6% to 0.9% from 2010 to 2019 (Fig 2). The estimated annual percentage change (EAPC) over the 10-year period was −7.25 (95% CI: −10.05 to −4.35) for perinatal HIV diagnoses and −6.70 (95% CI: −9.49 to −3.82) for perinatal HIV transmission rates. The numbers, as well as the EAPCs in perinatal HIV diagnosis and transmission rates by race and ethnicity, are presented in Tables 1–3.

Racial and ethnic differences in perinatal HIV diagnoses persisted through the 10-year period. The highest rates of perinatal HIV diagnoses were seen among infants born to Black women. The perinatal HIV diagnosis rate declined from 8.1 to 3.1 perinatal HIV diagnoses per 100 000 live births and did not reach the elimination goal in this group (Fig 2). Among infants born to white women, Hispanic/Latino women, or women of "other" race (which included American Indian/Alaska Native, Asian, Native Hawaiian/other Pacific Islander, and multiracial), the incidence (diagnosis rate) elimination goal was reached at different times in the 10-year period (Fig 2). Conversely, HIV transmission rates did not differ greatly by racial/ethnic group, and the transmission rate goal was achieved by Black and white persons, but not by persons of Hispanic/Latino ethnicity nor of other race. Compared with all other racial and ethnic groups, many more Black women have HIV and give birth; the racial and ethnic differences in diagnosis rates versus transmission rates suggest that Black women have success with perinatal HIV preventive interventions as frequently or even more frequently than other racial or ethnic groups. Hispanic/Latino women and women of

other race did not meet the transmission rate goal during any year between 2010 and 2019. These findings highlight the need to improve HIV prevention for Black women and suggest opportunities to improve perinatal HIV care for Hispanic/Latino women and women of other race.

The achievement of US elimination goals in 2019 is cause for celebration. Although the World Health Organization's elimination targets were met several years before, the CDC did not declare that achievement because stark disparities were apparent, especially between Black and white persons. From 2004 to 2007, the perinatal HIV diagnosis rate among Black persons was 24.6 times that of white persons.[4] This racial disparity diminished over the 10-year period from a factor of 16.5 in 2010 to a factor of 10.3 in 2019. A decline in HIV incidence among Black women is central to this achievement.

The elimination of perinatal HIV in the United States is the result of all aspects of public health and health care working together at local, state, and federal levels. It is important to acknowledge the vision of leaders at the CDC, the Health Resources and Services Administration, and the National Institutes of Health, as well as that of clinical, basic science, pharmaceutical, and public health researchers and the women who participated in studies that provided the tools that made this achievement possible. Health policy advocates and legislators whose efforts created the Ryan White Care Act are also critical to this success, for it provides guaranteed coverage for HIV treatment and other services. Public health professionals and tireless, dedicated clinical and social service providers have delivered these essential services that would not otherwise be consistently accessible to persons with fewer resources. Women with HIV and the organizations that support and advocate for women and children affected by HIV have driven much of relevant US policy. This comprehensive, coordinated approach is a public health model that can be replicated or expanded to areas beyond HIV.

Although much progress has been made, this success requires continuing effort. Each year, 3000 to 4000 women with HIV deliver infants, ~75% to 85% of whom have an HIV diagnosis before pregnancy.[5] Preventing HIV, such as through the more widespread provision of HIV preexposure prophylaxis, especially for black women, and proactively supporting people with HIV to optimize viral suppression and overall health before pregnancy helps assure not only perinatal HIV prevention but healthier women and infants. Thus, the bulk of this essential work will be done by primary health and HIV care providers rather than prenatal and pediatric care providers. Assuring prenatal care, HIV screening, and treatment during pregnancy for people of Hispanic ethnicity is also an important area of need. In addition, the coronavirus disease 2019 pandemic and public health response have especially challenged persons with fewer resources. The impact on HIV incidence and treatment is yet to be seen, but data reported to the CDC through December 2021 indicate that 35 cases of perinatally acquired HIV were diagnosed in 2020, slightly higher than 2019.[2] Although health systems were strained, there are also reports of surging rates of mental and behavioral health challenges resulting from social isolation and economic losses that may further complicate prevention efforts.

Persons taking current antiretroviral regimens can expect long lifetimes, during which many will choose to raise families. Health professionals from all sectors need to support persons with HIV in their reproductive choices and ensure that HIV treatment and preventive interventions are not only effective but also safe during conception, as well as throughout pregnancy and lactation. Up-to-date, comprehensive, and timely surveillance systems are needed for continuous and vigilant monitoring of the long-term safety of prenatal and early-life antiretroviral exposure. The development of even more convenient, safe, and effective HIV prevention modalities for women and infants needs to continue to be prioritized. Optimal approaches to infant feeding need to be further assessed.

Perinatal HIV transmission is being eliminated in the United States. This remarkable achievement is the result of the determination, innovation, cooperation, and dedication of numerous individuals working across multiple sectors, most notably, women with HIV. To safeguard and build on this success, we must maintain these values and principles in our work while centering the wellbeing of people with HIV within a framework of reproductive justice,[6] particularly considering the large, longstanding racial disparities that characterize HIV in the United States. To sustain elimination, we must continuously maintain the effort one woman, infant, and family at a time.

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ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
EAPC	estimated annual percentage change

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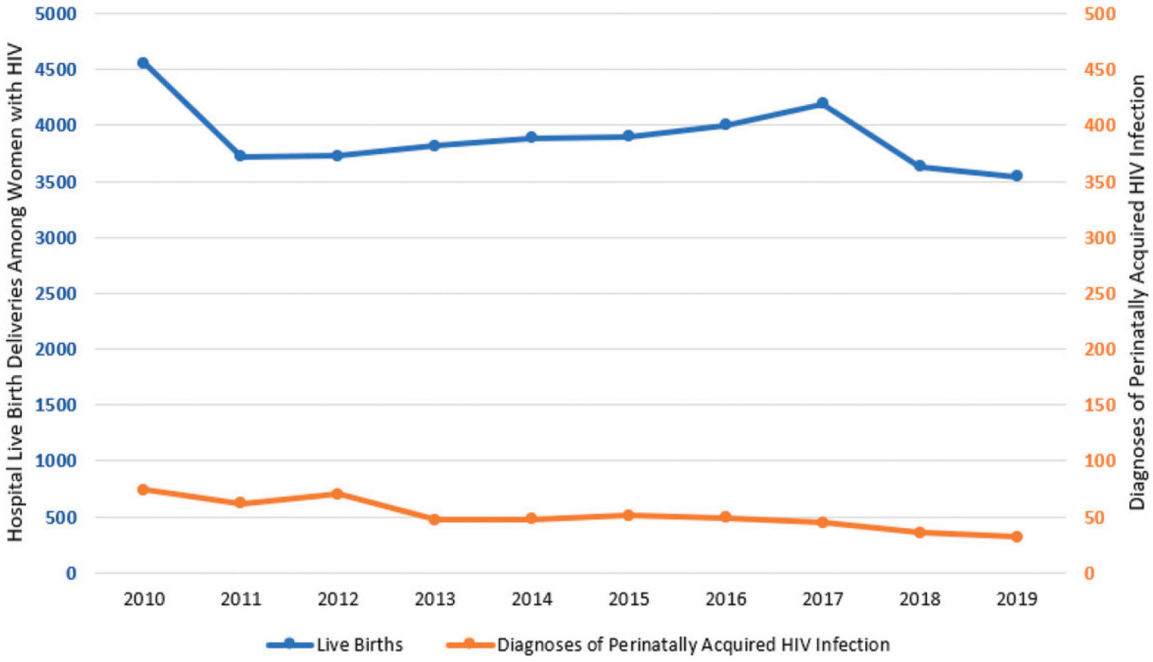

FIGURE 1.

Number of hospital-based live birth deliveries among women with an HIV diagnosis (left axis; National Inpatient Sample, Healthcare Cost and Utilization Project) and of US-born infants with a diagnosis of perinatally acquired HIV (right axis; National HIV Surveillance System) by year of birth, 2010–2019

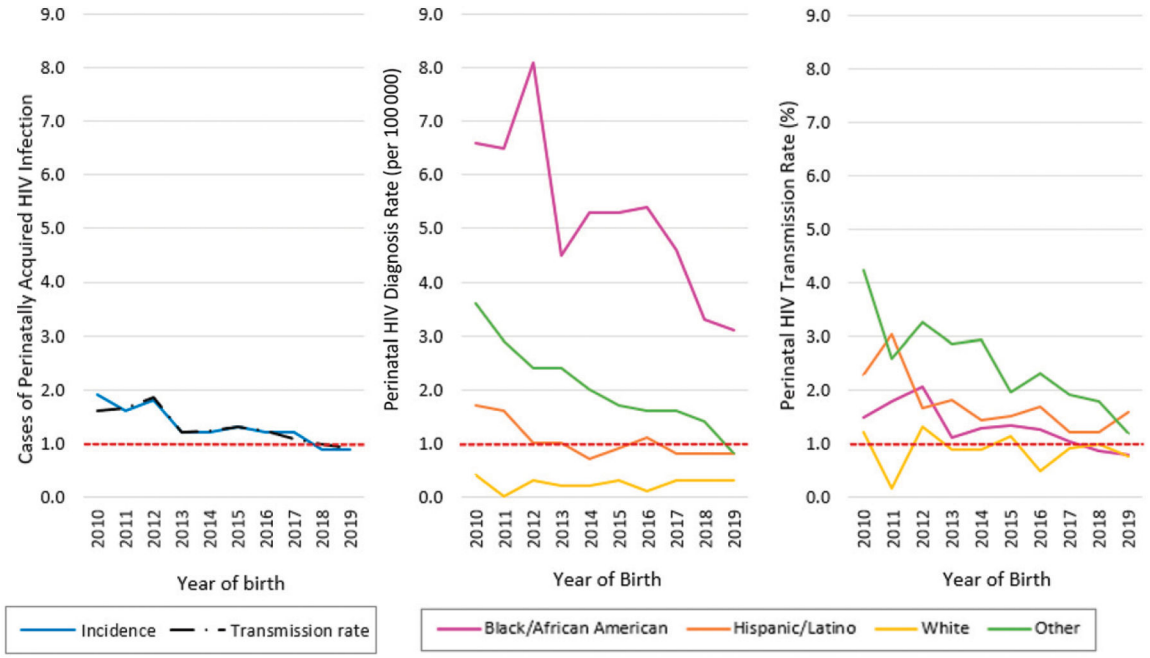

FIGURE 2.

Diagnosis rate and transmission rate of perinatally acquired HIV among persons born in the United States, by year of birth, overall, and by mother's race/ethnicity, 2010–2019. Diagnosis rates are per 100 000 live births (National HIV Surveillance System). Transmission rates are percentage of perinatally acquired HIV diagnoses among live births to women with an HIV diagnosis at delivery (National HIV Surveillance System; National Inpatient Sample, Healthcare Cost and Utilization Project). Hispanic/Latino persons can be of any race; other race includes American Indian/Alaska Native, Asian, Native Hawaiian/other Pacific Islander, and multiracial persons.

TABLE 1

Estimated Numbers of Hospital-Based Live-Birth Deliveries Among Women With an HIV Diagnosis and Reported Numbers of US-Born Infants With a Diagnosis of Perinatally Acquired HIV by Year of Birth, 2010–2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Live births[a]	4557	3721	3725	3815	3890	3899	4005	4195	3635	3540
Diagnoses of perinatally acquired HIV[b]	74	62	70	47	48	51	49	45	36	32

[a] National Inpatient Sample, Healthcare Cost and Utilization Project.

[b] National HIV Surveillance System.

TABLE 2

Diagnosis Rate and EAPC of Perinatally Acquired HIV Among Persons Born in the United States, by Year of Birth, Overall, and by Mother's Race and Ethnicity, 2010–2019

	Diagnosis Rate[a]										
Race and ethnicity	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**EAPC[b] (95% CI)**
Black/African American	6.6	6.5	8.1	4.5	5.3	5.3	5.4	4.6	3.3	3.1	−7.67 (−1 1.30 to −3.89)
Hispanic/Latino[c]	1.7	1.6	1.0	1.0	0.7	0.9	1.1	0.8	0.8	0.8	−8.42 (−14.77 to −1.60)
White	0.4	0.0	0.3	0.2	0.2	0.3	0.1	0.3	0.3	0.3	0.19 (−8.75 to 10.02)
Other	3.6	2.9	2.4	2.4	2.0	1.7	1.6	1.6	1.4	0.8	−12.05 (−19.43 to −4.00)
Total	1.9	1.6	1.8	1.2	1.2	1.3	1.2	1.2	0.9	0.9	−7.25 (−10.05 to −4.35)

Diagnosis rates are per 100 000 live births. CI, confidence interval.

[a] National HIV Surveillance System.

[b] Estimated annual percent change and 95% confidence intervals estimated using Poisson regression models.

[c] Hispanic/Latino persons can be of any race; other race includes American Indian/Alaska Native, Asian, Native Hawaiian/other Pacific Islander, and multiracial persons.

TABLE 3

Transmission Rate and EAPC of Perinatally Acquired HIV Among Persons Born in the United States, by Year of Birth, Overall, and by Mother's Race and Ethnicity, 2010–2019

	Transmission Rate[a,b]										
Race and ethnicity	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**EAPC[c] (95% CI)**
Black/African American	1.5	1.8	2.1	1.1	1.3	1.3	1.3	1.0	0.9	0.8	−7.62 (−1 1.24 to −3.86)
Hispanic/Latino[d]	2.3	3.0	1.7	1.8	1.4	1.5	1.7	1.2	1.2	1.6	−7.36 (−13.63 to −0.63)
White	1.2	0.2	1.3	0.9	0.9	1.1	0.5	0.9	1.0	0.8	−1.24 (−9.78 to 8.11)
Other	4.2	2.6	3.3	2.9	2.9	1.9	2.3	1.9	1.8	1.2	−9.63 (−17.12 to −1.47)
Total	1.6	1.7	1.9	1.2	1.2	1.3	1.2	1.1	1.0	0.9	−6.70 (−9.49 to −3.82)

Transmission rates are percentage of perinatally acquired HIV diagnoses among estimated live births to women with an HIV diagnosis at delivery. CI, confidence interval.

[a]National HIV Surveillance System.

[b]National Inpatient Sample, Healthcare Cost and Utilization Project.

[c]Estimated annual percent change and 95% confidence intervals estimated using Poisson regression models.

[d]Hispanic/Latino persons can be of any race; other race includes American Indian/Alaska Native, Asian, Native Hawaiian/other Pacific Islander, and multiracial persons.