Perinatal Hepatitis B Prevention Program (PHBPP): the National Perspective

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May 2024, Texas Perinatal Hepatitis B Summit

Personal Photo

Learning Objectives

- Describe the reasons why hepatitis B virus (HBV) transmission remains a serious global health problem
- Identify the key management activities to prevent mother-to-child hepatitis B virus transmission
- Describe the impacts the COVID-19 pandemic had on the national PHBPP program
- Identify two practices of high performing PHB programs that could help improve your program's outcomes

Epidemiology of Hepatitis B

- Hepatitis B virus infects and attacks the liver, causing inflammation and can lead to other serious liver disease

- 254 million persons worldwide are living with chronic hepatitis B[1]

- In the United States, between 580,000 -1.17 million persons are chronically infected[2]
  - Person born outside the U.S. are disproportionately affected
  - Account for 69% of chronic infections in the U.S.
  - 50% of chronically infected individuals are unaware of their infection[3]

1 Hepatitis B (who.int) accessed 4/30/24
2 Frequently Asked Questions for Health Professionals | CDC accessed 4/30/24
3 Bixler D, Barker L, Lewis K, Peretz L, Teshale E. Prevalence and awareness of Hepatitis B virus infection in the United States: January 2017 - March 2020. Hepatol Commun. 2023 Mar 30;7(4):e0118. doi: 10.1097/HC9.0000000000000118. PMID: 36996000; PMCID: PMC10069827.

Epidemiology of Hepatitis B

- Worldwide, most common mode of transmission is mother-to-child transmission (MTCT) during birth [1]
  - Transmission can occur through other modes

- Up to 90% of infants who become HBV infected will develop chronic infection [2]
  - 25% of those chronically infected infants will die prematurely of cirrhosis or liver cancer

1 Hepatitis B (who.int) accessed 4/30/24
2 Prevention of Hepatitis B Virus Infection in the United States:: Recommendations of the Advisory Committee on Immunization Practices (cdc.gov) accessed on 4/30/24

Preventing MTCT of hepatitis B virus

- Identification of HBsAg-positive* pregnant persons and hepatitis B virus (HBV)-exposed infants is critical

- Post-exposure prophylaxis (PEP) has a 94% combined efficacy against HBV infection
  - Hepatitis B immune globulin (HBIG) and a dose of single antigen hepatitis B vaccine administered in separate limbs with 12 hours of birth

*HBsAg- hepatitis B surface antigen

Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices (cdc.gov) accessed on 4/30/24

The National PHBPP

The National PHBPP

The National PHBPP

- Established in 1990 to provide case management services to HBV-exposed infants

- Funded by CDC Immunization Cooperative Agreements (Section 317 funding)
  - All 64 immunization programs
  - Program structure is flexible

- Program Required Strategies are based upon selected CDC's 2018 Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices recommendations

Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices (cdc.gov)

National PHBPP: Required Strategies (2019-2025)

- The required PHBPP strategies
  - Identify HBsAg-positive pregnant persons and births to HBsAg-positive persons
  - Ensure hepatitis B virus (HBV)-exposed newborns receive postexposure prophylaxis (PEP) per ACIP recommendations
  - Ensure HBV-exposed infants complete the hepatitis B vaccine series and receive postvaccination serologic testing (PVST) per ACIP recommendations

Management to prevent Mother-To-Child-Transmission (MTCT)

Management to prevent MTCT

Management Activities

Prenatal Period	Birth-6 months	9-12 months of age
Screen for HBsAg during each pregnancy. If HBsAg-positive, test for HBV DNA to guide anti-viral treatment and refer to PHBPP. If negative with high-risk behaviors, rescreen at hospital admission. If status is unknown at delivery, order HBsAg stat.	Administer Post Exposure Prophylaxis within 12 hours of birth: single antigen hepatitis B vaccine & HBIG in separate limbs. Complete vaccinations per ACIP recommendations based on birth weight and vaccine formulation. See Table 3: Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices (cdc.gov) Refer to PHBPP for case management.	PVST: HBsAg & anti-HBs only If series delayed, test 1-2 months after final dose. Never test before 9 months of age. Refer for evaluation if HBsAg-positive Revaccinate per ACIP recommendations if both HBsAg-neg &anti-HBs-negative.

Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices (cdc.gov)

Anti-HBs- antibodies to hepatitis B surface antigen

Management of Low-Birth-Weight Infants (LBW): <2,000 grams

Birth	1-6 months	9-12 months
Administer Post Exposure Prophylaxis within 12 hours of birth: single antigen hepatitis B vaccine & HBIG in separate limbs. Birth Dose is not counted as part of the hepatitis B vaccine series. **For unknown status do not wait on test results**	Additional hepatitis B single antigen doses given at: 1 month of age 2-3 months of age 6 months of age Combination Vaccines (including hepatitis B) additional doses given at: 2 months of age 4 months of age 6 months of age Do not administer final dose before 24 weeks of age (164 days). ****All LBW infants need 4 doses to complete the hepatitis B vaccine series.**	PVST: HBsAg & anti-HBs only. *If series delayed, test 1-2 months after final dose. Never test before 9 months of age. Refer for evaluation if HBsAg-positive. Revaccinate per ACIP recommendations if HBsAg-neg/anti-HBs-neg.

Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices (cdc.gov)

Improving Program Outcomes

Improving Program Outcomes

National Performance Targets

- Created to focus on improving outcomes of required strategies over time in cooperative agreement that began July 1, 2019
- Outlined in the Immunization Program Operations Manual- Chapter H
- Data sources used to measure performance targets are peritable and expected birth table
- Baseline measure 2015 Birth Cohort outcomes

ISD Awardees SharePoint Portal - FINAL_2_1_2024_IPOM_ALL.pdf - All Documents

Data Sources

Data Sources

Data Source: Peritable

Awardee	Infants identified (Section2 Q2a)	2021 Expected births (PE)	2021 Expected births (LL)	Percent of Expected Births identified (PE)	Percent of Expected Births identified (LL)	# of infants born to women with evidence suggestive of maternal HBV infection exists (Section2 Q2b)	# of infants born to women with unknown HBsAg status (Section2 Q2c)	Infants Transferred into program as of 12/31/2022 (Section2 Q2e)	Infants Transferred out of program as of 12/31/2022 (Section 2 Q2f)	Ir p (S
National	**6803**	**17,827**	**12,965**	**38%**	**52%**	**253**	**155**	**151**	**242**	
Texas	550	1152	829	48%	66%	0	0	14	14	
Cities										
Houston	96	213	162	45%	59%	2	0	0	10	
San Antonio	34	57	41	60%	83%	0	0	3	2	

PEP | Insure | No PEP | Total Outcomes

[Peritable2021v5_final.xlsx (sharepoint.com)]

Data Source: Expected Birth Tables

Mother's Origin of Birth (region)

Prevalence level for each subcategory of women in region

Prevalence level is applied to total births for subcategory and result is the number of expected births to HBsAg-positive women for this group

Maternal Residence	Births	United States-Born[1]					US Territory-Born[2]					Foreign-Born[3]								
		White, Non-Hispanic	Black, Non-Hispanic	Hispanic	Asian/ Pacific Islander	Other/ Unknown	American Samoa	Guam	Northern Mariana Islands	Puerto Rico	US Virgin Islands	Africa	East Asia						Eastern Europe	Southern Europe	
		0.0007	0.0037	0.0003	0.0052	0.0056	0.0255	0.0043	0.0117	0.0001	0.0014	0.0327	0.0852	0.0037	0.0376	0.0172	0.00	0.0028	0.0051	0.012	
United States*	All Births	1,764,989	431,805	493,747	54,451	131,310	912	1,508	181	19,931	988	61,077	44,163	71,194					29,090	9,938	
	HBsAg Births	1,233	1,597	147	283	737	24	4	2	1	1	1,996	3,763	262					144	118	
States**																					
Texas	All Births	105,355	30,191	93,118	3,135	4,782	46	152	<10	1,032	73	5,206	2,197	7,030					903	365	
	HBsAg Births	74	112	28	16	27	1	1	0	0	0	170	187	26					5	4	
Cities																					
Houston	All Births	6,250	7,908	10,514	651	400	<10	10	<10	102	22	1,162	419	806					178	49	
	HBsAg Births	4	29	3	3	2	0	0	0	0	0	38	36	3					1	1	
San Antonio	All Births	3,818	1,219	11,325	113	329	<10	21	<10	109	<10	223	103	278					62	30	
	HBsAg Births	3	5	3	1	2	0	0	0	0	0	7	9	1	7	2	0	0	0	0	

Updated: 11/27/2023

* United States totals are sum of state and city data only; territory data is excluded from this sum. Values <10 are excluded from all totals.

** Illinois data excludes Chicago, New York data excludes New York City, Pennsylvania data excludes Philadelphia, and Texas data excludes Houston and San Antonio.

*** American Samoa currently uses the 1989 standard birth certificate and limited information on maternal country of birth is available.

Source of HBsAg prevalence estimates: [1,4] National Health and Nutrition Examination Survey 2009-2014; [2] 2009-2014 Annual Reports; [3] Walker TY, Smith EA, Fenlon N, et al. Characteristics of Pregnant Women with Hepatitis B Virus Infection in Five U.

Source of birth data: National Center for Health Statistics. Natality 2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.

Point | Lower | Regions

Data Source: Expected Birth Tables

Women from Africa & East Asia accounted for approx. 43% of the expected births to HBsAg-positive women in 2021 in Texas,46% in Houston and 39% in San Antonio

Total US Births for CY 2021 (3.6 million) and Total Expected Births to HBsAg-positive women in the US for 2021 (12,965 Lower Limit)

Total number of births in Texas and expected number of HBsAg-positive

Maternal Residence	White, Non-Hispanic					Puerto Rico	US Virgin Islands	Africa	East Asia	South Asia	Southeast Asia	West/ Central Asia	Australia /Oceania	Caribbean (except Haiti)	Eastern Europe	Southern Europe	Western and Northern Europe	Total Births
	0.0007	0.0037	0.0003	0.0052	0.0056	0.0255	0.0043	0.0117	0.0001	0.0014	0.0327	0.0852	0.0037	0.0376	0.0172	0.00	0.0028	0.0051	0.012	0.0012	
United States*	1,764,989	431,805	493,747	54,451	131,310	912	1,508	181	19,931	988	61,077	44,163	71,194							21,17	3,663,578
	1,233	1,597	147	283	737	24	4	2	1	1	1,996	3,763	262							2	12,965
States**																					
Texas	105,355	30,191	93,118	3,135	4,782	46	152	<10	1,032	73	5,206	2,197	7,030							1,58	309,575
	74	112	28	16	27	1	1	0	0	0	170	187	26								829
Cities																					
Houston	6,250	7,908	10,514	651	400	<10	10	<10	102	22	1,162	419	806	846	185	17	629	178	49	205	43,041
	4	29	3	3	2	0	0	0	0	0	38	36	3	32	3	0	2	1	1	0	162
San Antonio	3,818	1,219	11,325	113	329	<10	21	<10	109	<10	223	103	278	188	92	<10	76	62	30	135	20,949
	3	5	3	1	2	0	0	0	0	0	7	9	1	7	2	0	0	0	0	0	41

Updated: 11/27/20

* United States total and city data only; territory data is excluded from this sum. Values <10 are excluded from all totals.

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Source of HBsAg pre es: [1,4] National Health and Nutrition Examination Survey 2009-2014; [2] 2009-2014 Annual Reports; [3] Walker TY, Smith EA, Fenlon N, et al. Characteristics of Pregnant Women with Hepatitis B Virus Infection in Five U.S. Public Health Jurisd

Source of birth data r for Health Statistics. Natality 2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.

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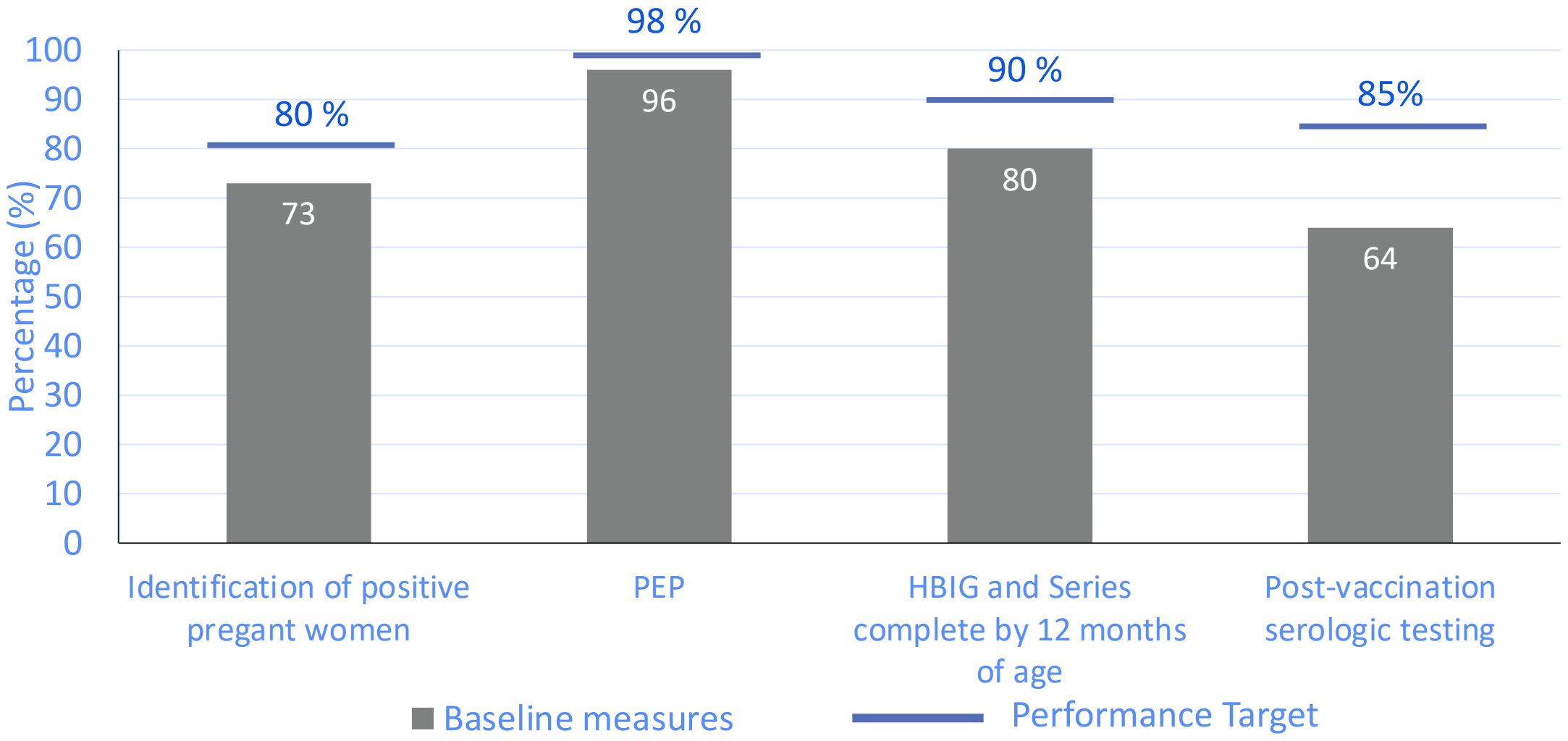
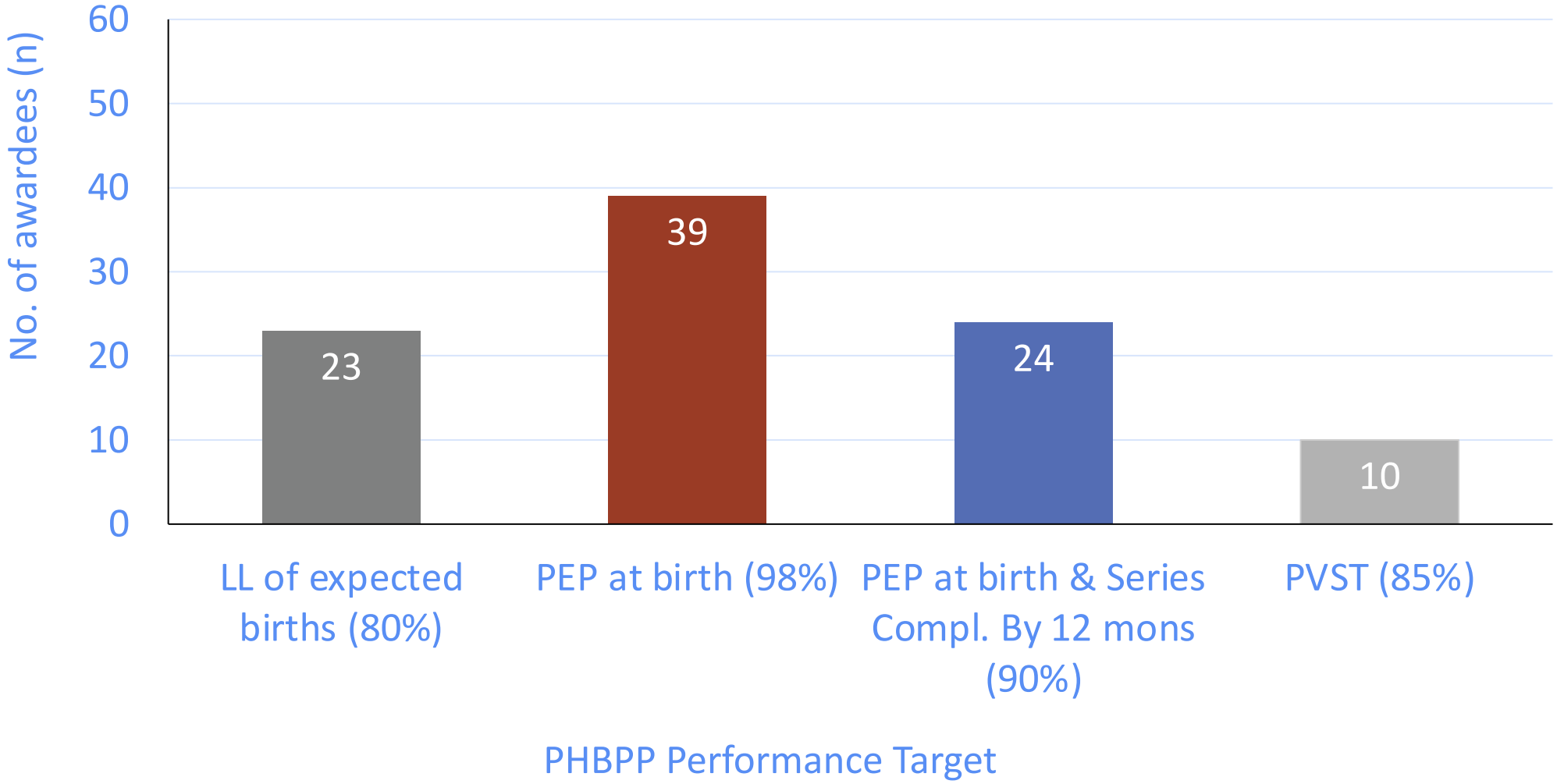
PHBPP Project Period Baseline measures and Performance Targets – United States



Number of awardees reaching the performance target goal for each required PHBPP strategy – 2015 birth cohort



Impact of the COVID-19 Pandemic

Impact of the COVID-19 Pandemic

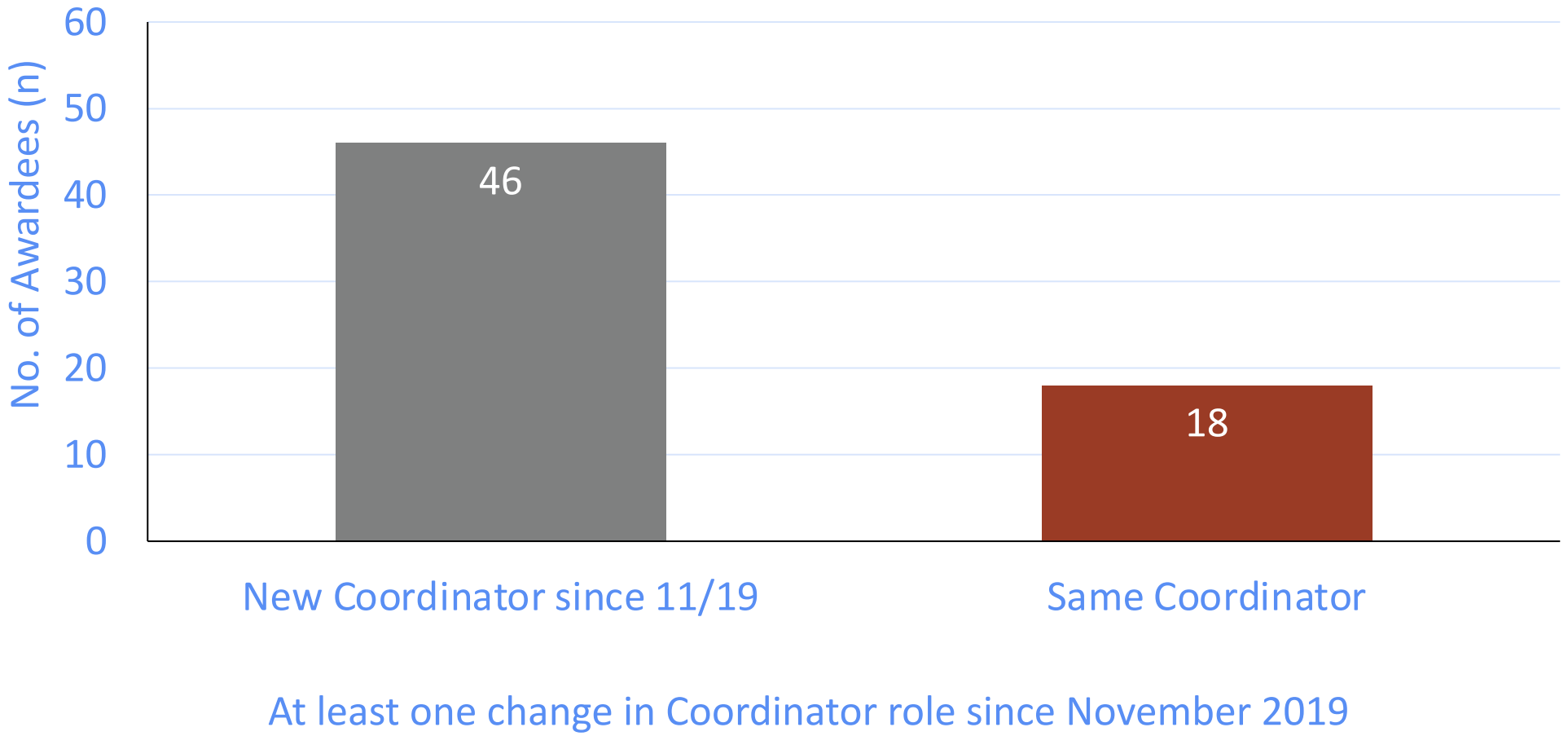
Impact of the COVID-19 Pandemic

- **COVID-19 pandemic impacted global HBV elimination targets[1]**
  - Major hurdles in staffing, screening, diagnosis and management

- **National- and awardee-level PHBPP were impacted**
  - Priorities shifted
  - Staff turnover
  - Impact to performance targets

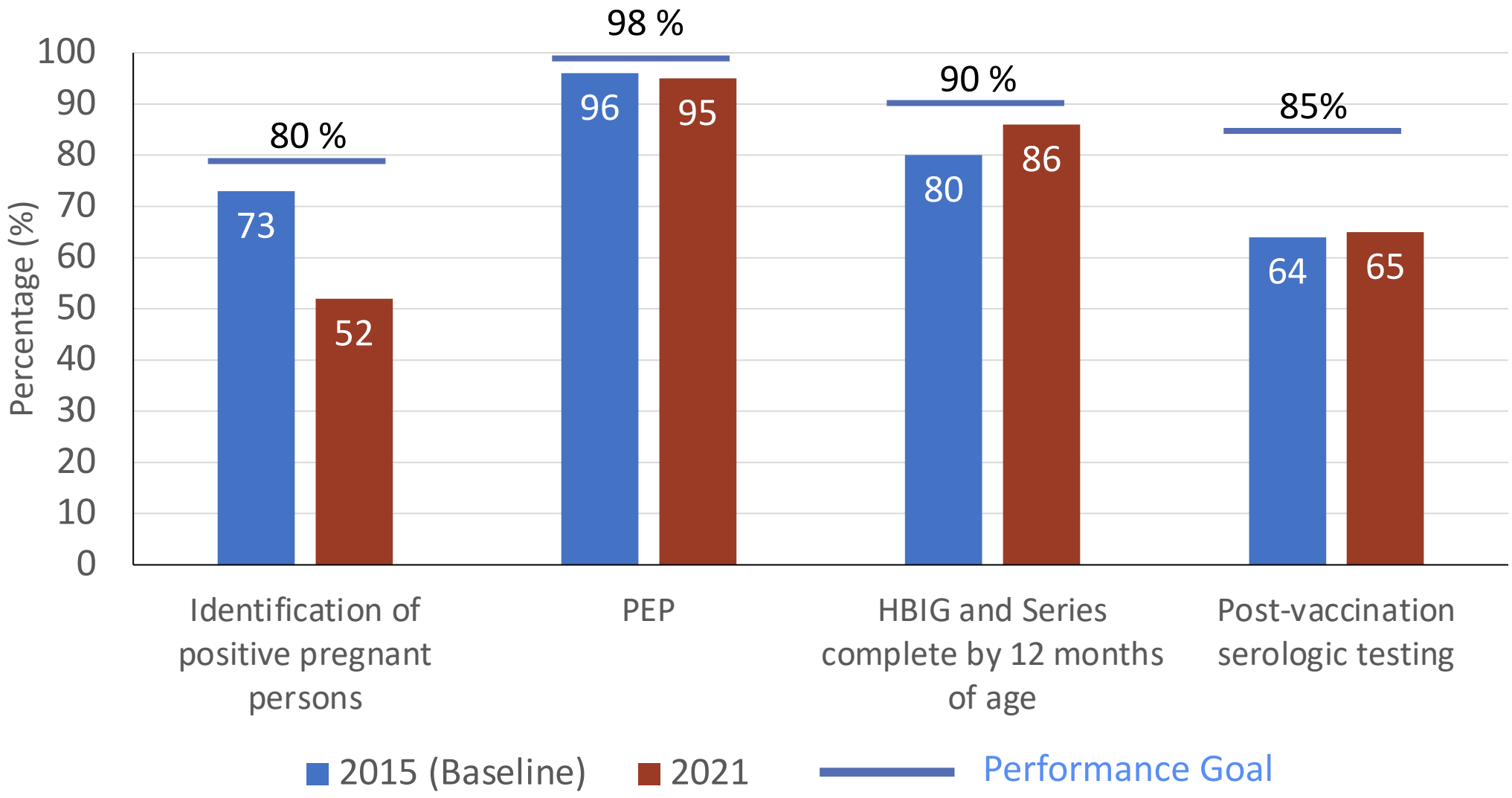
1. Kondili LA, Buti M, Riveiro-Barciela M, Maticic M, Negro F, Berg T, Craxì A. Impact of the COVID-19 pandemic on hepatitis B and C elimination: An EASL survey. JHEP Rep. 2022 Sep;4(9):100531. doi: 10.1016/j.jhepr.2022.100531. Epub 2022 Jul 27. PMID: 35967191; PMCID: PMC9364666.

Awardee Staffing for the PHBPP*



* As of 3/01/2024

PHBPP Project Period Baseline and Goal Performance Targets – United States, 2015 & 2021



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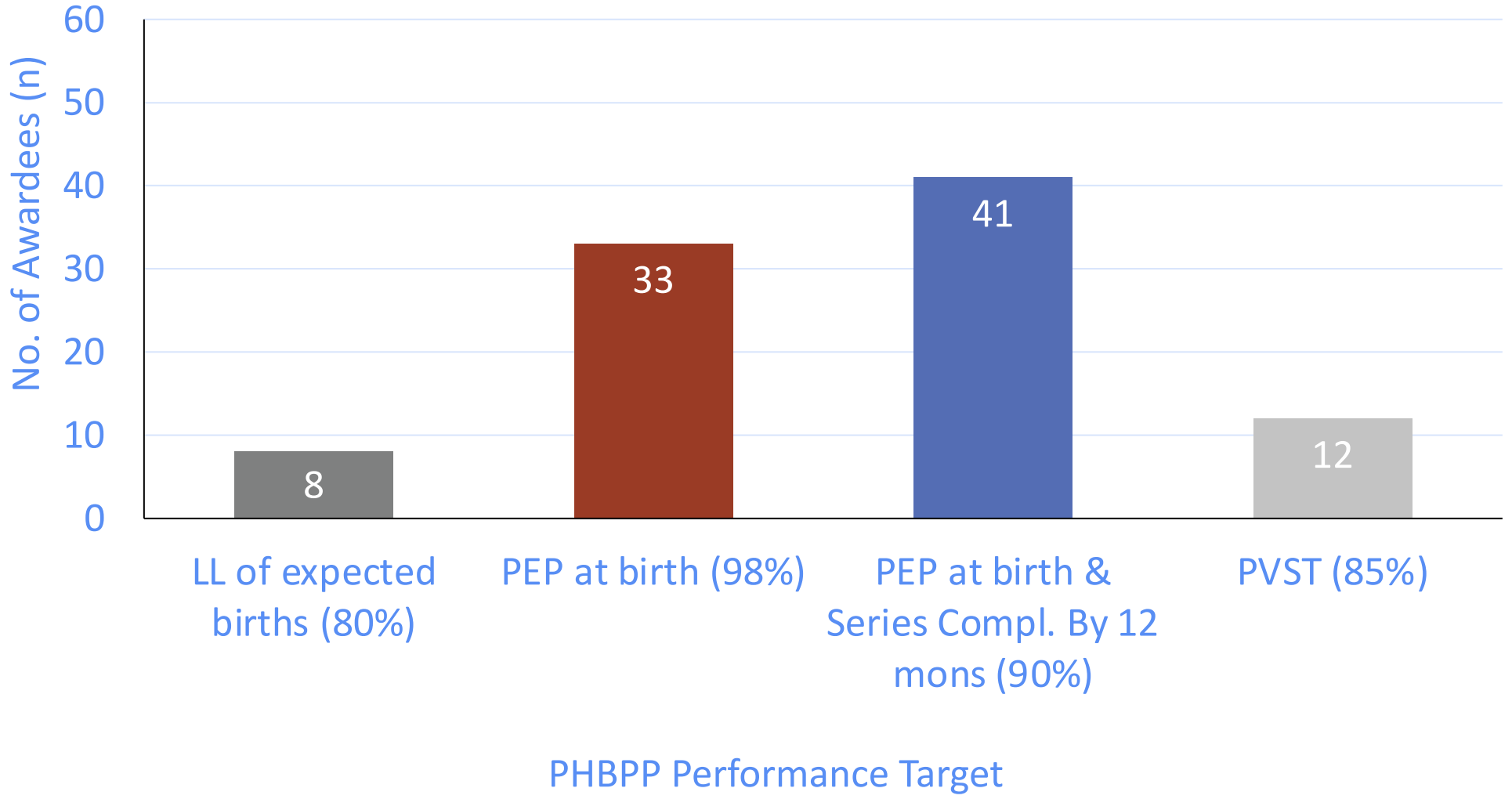


Unpublished data PHBPP Annual Report 2022- Do not reference

High performing awardees

- One awardee met or exceeded the target for all 4 required strategies for the 2021 birth cohort
  - NYC
  - Met or exceeded the target for all 4 strategies since 2019

- Three awardees met or exceeded the target for all required strategies EXCEPT PVST for 2021 birth cohort
  - IA, MN, ND
  - IA, MN, and ND met or exceeded the target for all required strategies except PVST since 2019
    - Iowa has improved PVST outcome from 60% (2019 birth cohort) to 78% (2021 birth cohort)
    - Minnesota has been steady with a PVST rate between 76% (2019 birth cohort) & 74% (2021 birth cohort)

Best practices and observed characteristics of high performing programs?

- **Experienced program coordinator**

- **Standardize case management system**
  - To follow the progression of a family through case management

- **Standardized policies and procedures for all aspects of the program**
  - Management is standardized across the jurisdiction and between case management staff
  - Can assist in preventing succession outcome decline

Observed Characteristics cont.

- **Knowledge about the community served by the program**

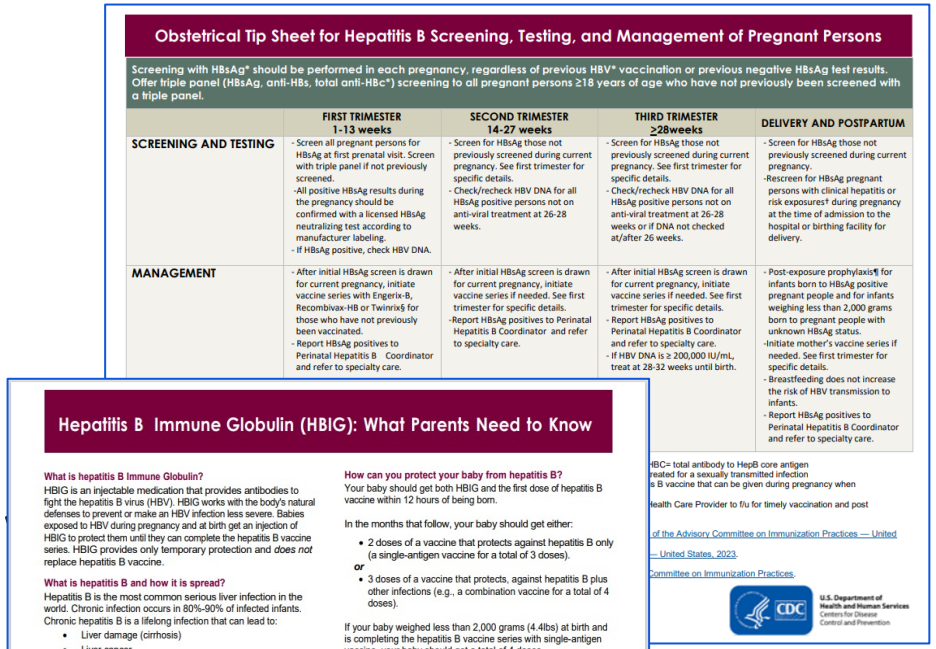
- **Ability to build relationships and communicate with providers and local health department staff who serve the population**
  - Periodic contact to provide updates and education to local health department staff
    - In-person, virtual, phone
  - Orient new case management staff
  - Explain the national program
  - Communicate management needs of HBsAg-positive pregnant person and exposed newborn

PHBPP Activities & Resources

PHBPP Activities & Resources

National PHBPP activities and resources to support awardee programs

- New Awardee Coordinator Orientation
- Community Share Point Site
- Provider Tips sheets
- HBIG Fact Sheet for parents
- Perinatal Maternal Immunization Reverse Site
- Quarterly Meetings
- Office Hour Calls
- Individualized technical assistance upon request



Obstetrical Tip Sheet for Hepatitis B Screening, Testing, and Management of Pregnant Persons

Screening with HBsAg* should be performed in each pregnancy, regardless of previous HBV* vaccination or previous negative HBsAg test results. Offer triple panel (HBsAg, anti-HBs, total anti-HBc*) screening to all pregnant persons ≥18 years of age who have not previously been screened with a triple panel.

	FIRST TRIMESTER 1-13 weeks	SECOND TRIMESTER 14-27 weeks	THIRD TRIMESTER ≥28weeks	DELIVERY AND POSTPARTUM
SCREENING AND TESTING	- Screen all pregnant persons for HBsAg at first prenatal visit. Screen with triple panel if not previously screened. -All positive HBsAg results during the pregnancy should be confirmed with a licensed HBsAg neutralizing test according to manufacturer labeling. - If HBsAg positive, check HBV DNA.	- Screen for HBsAg those not previously screened during current pregnancy. See first trimester for specific details. - Check/recheck HBV DNA for all HBsAg positive persons not on anti-viral treatment at 26-28 weeks.	- Screen for HBsAg those not previously screened during current pregnancy. See first trimester for specific details. - Check/recheck HBV DNA for all HBsAg positive persons not on anti-viral treatment at 26-28 weeks or if DNA not checked at/after 26 weeks.	- Screen for HBsAg those not previously screened during current pregnancy. -Rescreen for HBsAg pregnant persons with clinical hepatitis or risk exposures† during pregnancy at the time of admission to the hospital or birthing facility for delivery.
MANAGEMENT	- After initial HBsAg screen is drawn for current pregnancy, initiate vaccine series with Engerix-B, Recombivax-HB or Twinrix§ for those who have not previously been vaccinated. - Report HBsAg positives to Perinatal Hepatitis B Coordinator and refer to specialty care.	- After initial HBsAg screen is drawn for current pregnancy, initiate vaccine series if needed. See first trimester for specific details. -Report HBsAg positives to Perinatal Hepatitis B Coordinator and refer to specialty care.	- After initial HBsAg screen is drawn for current pregnancy, initiate vaccine series if needed. See first trimester for specific details. - Report HBsAg positives to Perinatal Hepatitis B Coordinator and refer to specialty care. - If HBV DNA is ≥ 200,000 IU/mL, treat at 28-32 weeks until birth.	- Post-exposure prophylaxis¶ for infants born to HBsAg positive pregnant people and for infants weighing less than 2,000 grams born to pregnant people with unknown HBsAg status. -Initiate mother's vaccine series if needed. See first trimester for specific details. - Breastfeeding does not increase the risk of HBV transmission to infants. - Report HBsAg positives to Perinatal Hepatitis B Coordinator and refer to specialty care.

HBC= total antibody to HepB core antigen
reated for a sexually transmitted infection
s B vaccine that can be given during pregnancy when
lealth Care Provider to f/u for timely vaccination and post
of the Advisory Committee on Immunization Practices — United
— United States, 2023.
Committee on Immunization Practices.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Hepatitis B Immune Globulin (HBIG): What Parents Need to Know

What is hepatitis B Immune Globulin?
HBIG is an injectable medication that provides antibodies to fight the hepatitis B virus (HBV). HBIG works with the body's natural defenses to prevent or make an HBV infection less severe. Babies exposed to HBV during pregnancy and at birth get an injection of HBIG to protect them until they can complete the hepatitis B vaccine series. HBIG provides only temporary protection and *does not* replace hepatitis B vaccine.

What is hepatitis B and how it is spread?
Hepatitis B is the most common serious liver infection in the world. Chronic infection occurs in 80%-90% of infected infants. Chronic hepatitis B is a lifelong infection that can lead to:

- Liver damage (cirrhosis)
- Liver cancer
- Early death

HBV spreads through contact with an infected person's blood or other body fluids. The virus can pass from mother to baby during pregnancy and at delivery.

Why does your baby need HBIG?
A baby whose mother is infected with HBV can become infected during pregnancy and at delivery. Because of the risk that an infected newborn could develop chronic hepatitis B, any baby born to a mother who is *or who might be* infected should receive HBIG.

- A baby whose mother is known to have hepatitis B should receive HBIG soon after birth.
- A baby weighing less than 2,000 grams (4.4lbs) born to a mother *who might be infected with* HBV also should receive HBIG soon after birth.

Why does your baby also need hepatitis B vaccine?
Because their immune systems are not fully developed at birth, babies can catch serious infections in their first months of life. The possibility that an HBV infection could turn into chronic hepatitis B means that even more care is needed to keep your baby protected.

Any baby born to a mother who has hepatitis B or who might have an undiagnosed HBV infection should receive *both* HBIG *and* all recommended doses of hepatitis B vaccine.

HBIG provides immediate protection that lasts 4 to 6 months, time enough for the vaccine to help build a baby's natural defenses.

How can you protect your baby from hepatitis B?
Your baby should get both HBIG and the first dose of hepatitis B vaccine within 12 hours of being born.

In the months that follow, your baby should get either:

- 2 doses of a vaccine that protects against hepatitis B only (a single-antigen vaccine for a total of 3 doses).

or

- 3 doses of a vaccine that protects, against hepatitis B plus other infections (e.g., a combination vaccine for a total of 4 doses).

If your baby weighed less than 2,000 grams (4.4lbs) at birth and is completing the hepatitis B vaccine series with single-antigen vaccine, your baby should get a total of 4 doses.

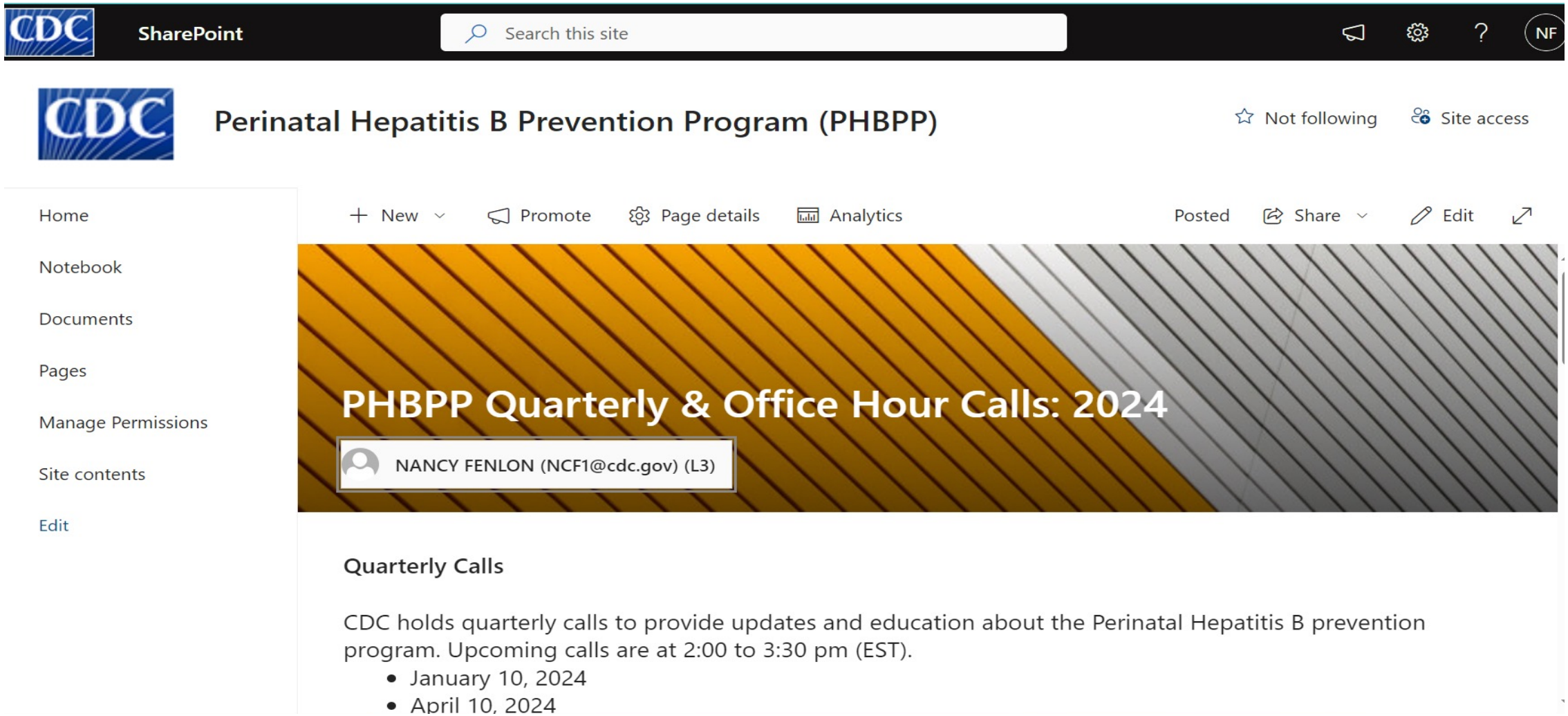
Your baby should receive their last dose of hepatitis B vaccine at 24 weeks of age (6 months). At 9-12 months of age, your baby should be tested to see if they are protected from hepatitis B.

How well does HBIG work?
HBIG is 71% effective at preventing hepatitis B from being passed to a baby during birth. When HBIG is combined with the hepatitis B vaccine birth dose, effectiveness rises to 94%.

What are the side effects of HBIG?
Serious side effects related to HBIG are rare. As with any injection, a baby who receives HBIG might have temporary pain, redness, or swelling where the injection was given, or feel general discomfort or pain.

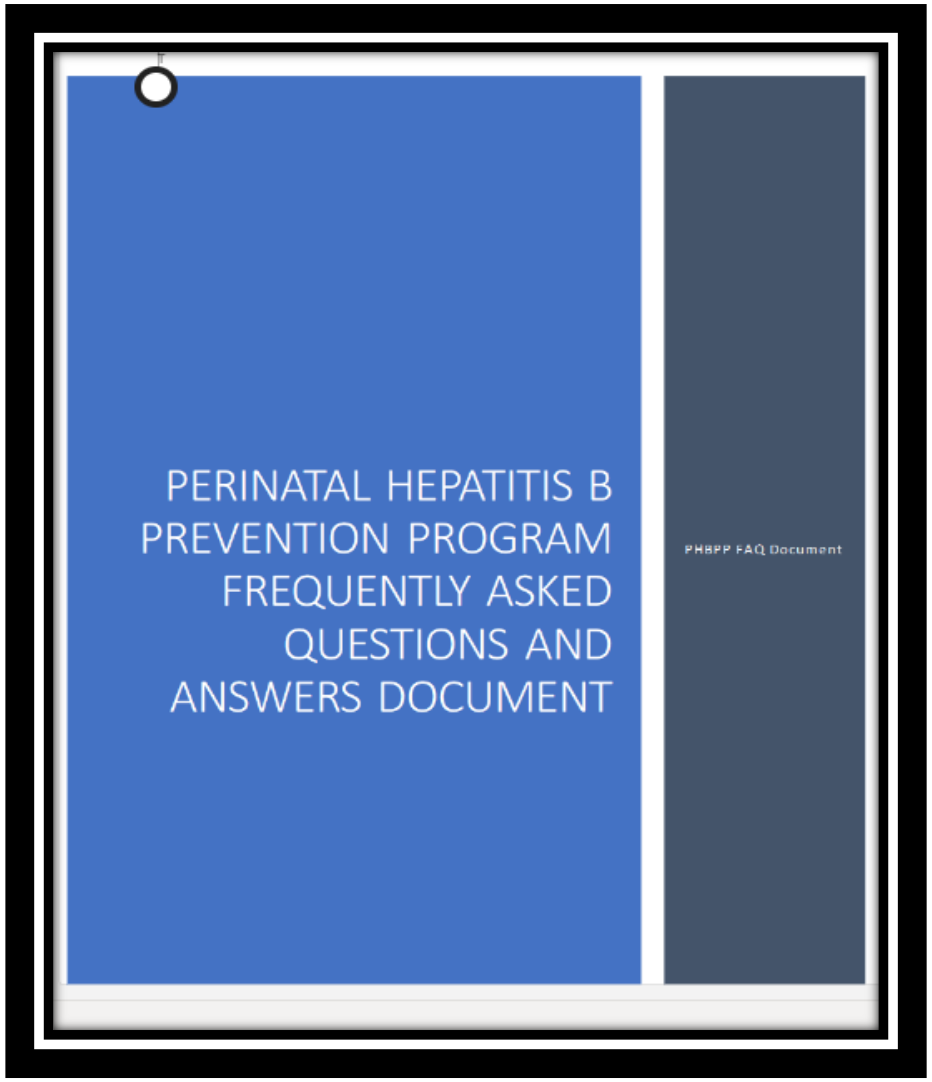
PHBPP Coordinator contact information:

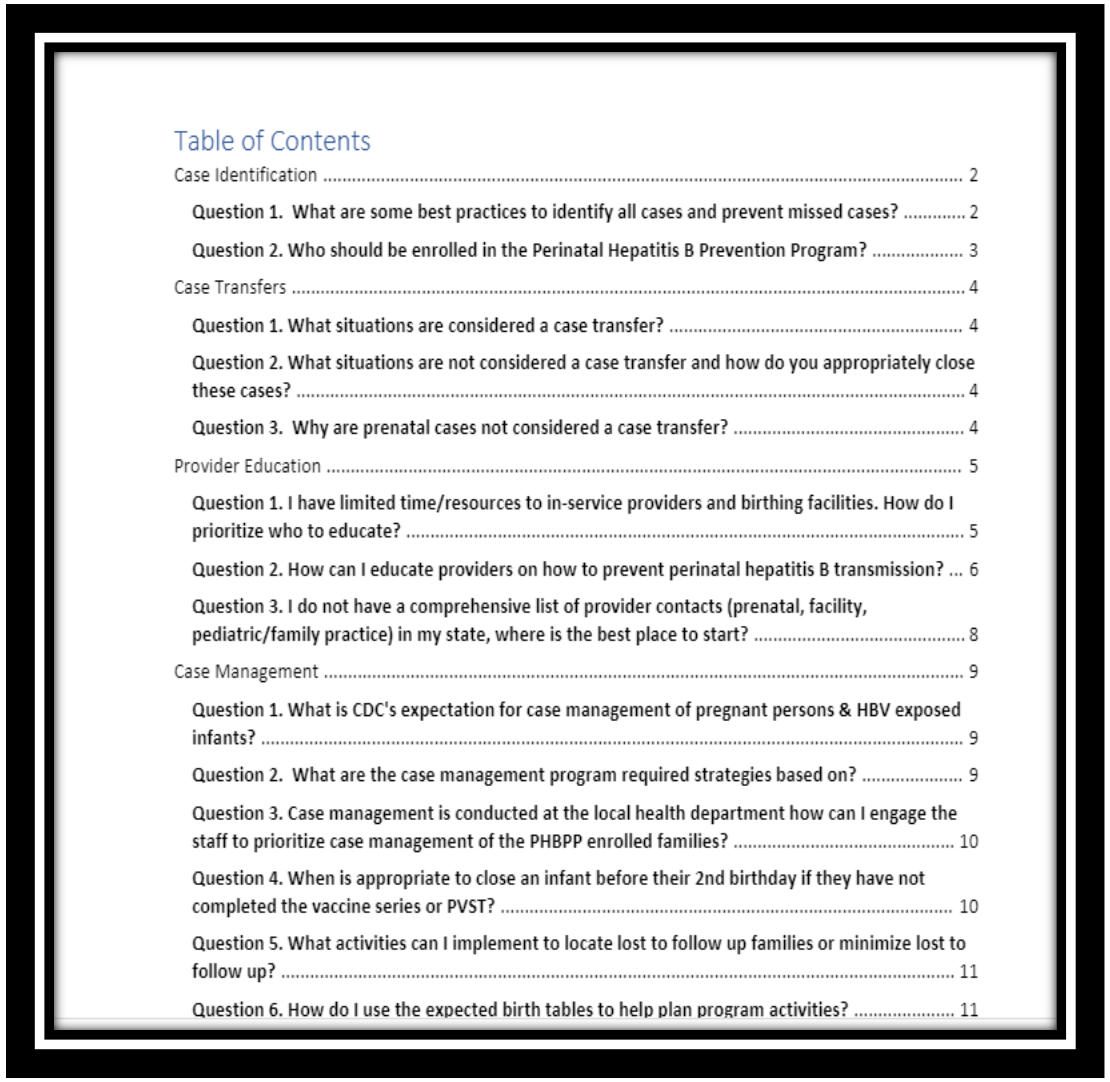
Resources: PHBPP Community SharePoint Site



[Perinatal Hepatitis B Prevention Program (PHBPP) - Home (sharepoint.com)]

Resources: PHBPP Community SharePoint Site FAQ document





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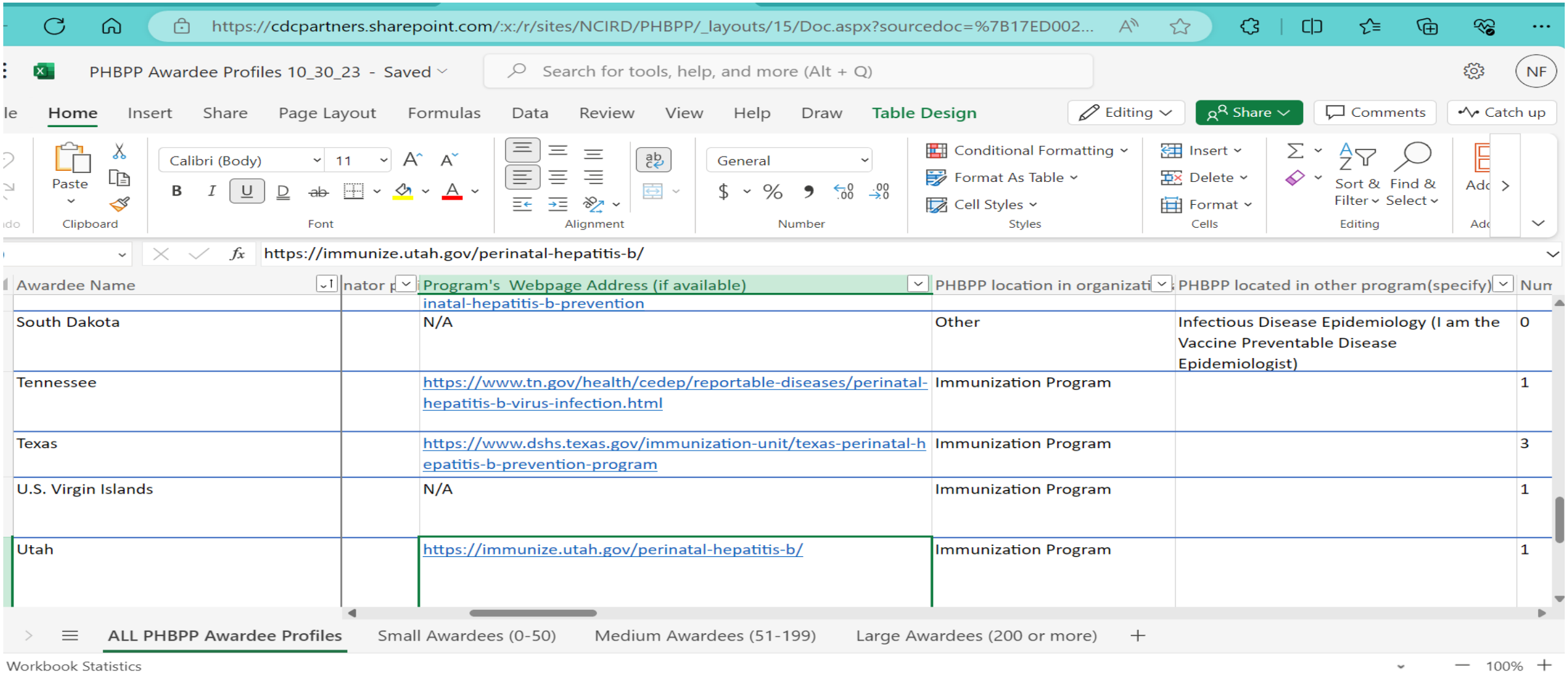
Perinatal Hepatitis B Prevention Program (PHBPP) - Home (sharepoint.com)

Resources: PHBPP Community SharePoint Site Awardee Profile



Resources: PHBPP Webpage

Vaccines & Immunizations

CDC

Perinatal Hepatitis B Prevention Program

Print

Here you will find Perinatal Hepatitis B Prevention Program-related resources for PHBPP staff at the state, local, and territorial levels.

Contacts

Perinatal Hepatitis B Coordinator List
Maintained by CDC's National Center for Immunization and Respiratory Diseases

ACIP Hepatitis B Recommendations

- Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices
  Sarah Schillie, MD; Claudia Vellozzi, MD; Arthur Reingold, MD; et al.
  MMWR, January 12, 2018, Vol 67,(1);1-31

Perinatal Hepatitis B Prevention Program | CDC

Questions?

Personal Photo

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.