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## **Public Health Evaluation Project**

### **A Feasibility Study of Using Birth Dose Hepatitis B Vaccination Rates as a Quality Metric in Hospitals**

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Hospitals that participated in the feasibility metric survey

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# 1 Background

In May 2009, the National Quality Forum (NQF) published its recommended standards for perinatal care. The purpose of these standards is “to improve the quality of maternal-child care – through accountability and public reporting – by standardizing quality measurement in all relevant care settings.”<sup>1</sup> These standards include the administration of hepatitis B vaccine to all newborns before discharge from the hospital (i.e., NQF Measure ID#0475). The NQF has granted time-limited endorsement of this quality metric for which the Centers for Disease Control and Prevention (CDC) is the intellectual property owner.

Part of the NQF initiative for establishing standards or quality measurement and for endorsing various quality measures is an evaluation process of proposed quality measures owned by various public health and medical entities. This process includes four major criteria:<sup>2</sup> (1) importance to measure and report; (2) scientific acceptability of the measurement properties; (3) usability; and (4) feasibility.

The objective of this study was to determine the feasibility of a hospital-based measure of hepatitis B vaccine administration for live newborns before hospital discharge. Results from the feasibility study are described in this report. The findings are organized based on the criteria outlined by the NQF for evaluating a field-tested, time-limited endorsed standard.<sup>3</sup> These criteria include:

1. Multi-site testing in a variety of settings;
2. Measurement of vaccination and/or excluded refusal rates, including number of cases, measure calculations, sample size, and definition of exclusions;
3. Analysis of excluded cases;
4. Challenges to measuring vaccination and refusal rates and planned changes that may facilitate ability to provide data;
5. Baseline performance data by each testing site;
6. Time burden to collect data for this metric;
7. Direct or indirect costs associated with data collection;
8. Demonstration of reliability and validity;
9. Types of data sources used for responses to the feasibility study; and
10. Stratification of hepatitis B vaccination rates by patient characteristics.

The CDC funded this feasibility study,<sup>4</sup> which was nested in a public health evaluation project conducted by the Texas Department of State Health Services (DSHS) from February 2009 through June 2010. The purpose of this evaluation project, *Public Health Evaluation Project – Assessing Hospital Policies and Practices of Hepatitis B, HIV,*

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<sup>1</sup> National Quality Forum (NQF). National Voluntary Consensus Standards for Perinatal Care 2008: A Consensus Report. Washington, DC: NQF; 2009.

<sup>2</sup> National Quality Forum (NQF). Burstin H. Maximizing impact of quality measurement research on policies and programs. Academy Health Webinar, May 27, 2010.

<sup>3</sup> National Quality Forum (NQF). Time-Limited Endorsement Policy. 2007.

<sup>4</sup> The NQF feasibility study will be referred to as the feasibility study in this document.



*Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008*,<sup>5</sup> was to assess policies and practices related to screening and vaccination for hepatitis B, human immunodeficiency virus (HIV), rubella, and syphilis through reviews of mother and infant medical charts at birthing hospitals in Texas. The feasibility study took advantage of hepatitis B vaccination rates determined from medical chart reviews to compare to birth dose coverage estimates in the feasibility study.

DSHS contracted with The Litaker Group to conduct the public health evaluation project and feasibility study. The Litaker Group is a management consulting firm specializing in health and medical preparedness, as well as research, evaluation, and public policy. The educational experience of staff members who worked on this project consists of doctoral degrees in health outcomes research and microbiology and master's degrees in public health, pharmacy administration, and microbiology. Vocational experience of staff members includes public health practice, research and evaluation, public policy, and health and medical preparedness.

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<sup>5</sup> Headley VL, Litaker JR, Chou, JY, Ramón M, Hasty K. Assessing Hospital Policies and Practices of Hepatitis B, HIV, Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008. June 2010.





## 2 Methods

This feasibility study was conducted as part of a larger public health evaluation project to assess policies and practices related to the prevention of perinatal transmission of hepatitis B, HIV, syphilis, and rubella. Details of methods used to select the 119 hospitals and 25,706 medical records (12,670 maternal records and 13,036 neonate records) for review in the public health evaluation project are available in Section 5: [Appendix: Methods for Public Health Evaluation Report](#). The methods described below are specific to the feasibility study.

### 2.1 Sample Selection

The sample of hospitals was selected from the cohort of hospitals in the larger public health evaluation project.<sup>6</sup> The hospitals for the evaluation project were selected based on the following criteria: (1) geographically located in each of the eight DSHS health service regions (See Section 8: [Appendix: DSHS Health Service Regions](#)); (2) having a significant number of births as defined by greater than 100 live births or 30 cesarean births in 2008;<sup>7</sup> (3) geographically located in areas of the state with a known high incidence of hepatitis B; and (4) identified by DSHS regional perinatal nurse coordinators to be included in the evaluation project.<sup>8</sup> A total of 119 hospitals participated in the DSHS public health evaluation project, and all were eligible for and invited to participate in the feasibility study.

Participants were identified from the larger public health evaluation project cohort of hospitals; however, those that chose to participate in this feasibility study self-selected themselves for participation. Hospitals were not provided an incentive to participate but were encouraged to do so in order to assist with evaluating the feasibility of using the NQF-endorsed hospital-based hepatitis B vaccination metric. Some hospitals indicated that did not participate voluntarily because of a lack of time and staff to devote to gathering information to respond to the survey. No other attempt was made to collect information on other reasons for nonparticipation in the study.

### 2.2 Survey Development

The Litaker Group created an assessment tool to support data gathering for this feasibility study. Both DSHS and the CDC provided invaluable comments on the assessment tool before the survey was released to the hospitals (See Section 7: [Appendix: Survey Tool](#)).

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<sup>6</sup> Headley VL, Litaker JR, Chou, JY, Ramón M, Hasty K. Assessing Hospital Policies and Practices of Hepatitis B, HIV, Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008. June 2010.

<sup>7</sup> A significant number of births are those from hospitals identified in the DSHS Annual Hospital Survey with greater than 100 deliveries per year (2008) and the Texas Healthcare Information Collection with greater than 30 cesarean births per year (2007). A total of 225 Texas hospitals met these criteria.

<sup>8</sup> Headley VL, Litaker JR, Chou, JY, Ramón M, Hasty K. Assessing Hospital Policies and Practices of Hepatitis B, HIV, Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008. June 2010.



## 2.3 Survey Administration

A cover letter and the assessment tool were sent via email to each of the 119 hospitals (See [Section 6: Appendix: Cover Letter](#)). The survey was completed at the sole discretion of the respondent, although reminder notifications were provided via e-mail and telephone calls over a five-week period until 50 total hospitals agreed to participate. Participating hospitals could submit results by fax, mail, or online. Responses to the feasibility survey were received from hospitals between March and April 2010. Data collection ceased and data analysis commenced when the minimum number of participating facilities was obtained. The minimum number of participating hospitals was determined in accordance with the NQF field-testing criterion that states that the adequacy of the sample size for “multi-site testing in a variety of settings” is 50-100 entities.<sup>9</sup> The sample size of 50 hospitals represented an overall annual birth cohort of over 100,000 births.

## 2.4 Data Collection

Data requested for this survey were for calendar year 2008.<sup>10</sup> If the designated person for a hospital could not provide data for the calendar year 2008, that person was asked to identify and provide data for an alternate time period so that the hospital would not be excluded from the study sample.

Key data elements in the survey included:

- Number of neonates vaccinated in calendar year 2008 or alternate time period;
- Number of guardian refusals for the same time period for which the hospitals provided the number of vaccinated neonates;
- Source information for all data provided (e.g., pharmacy records, medical records, etc.);
- Time and resources to collect this data; and
- Changes to be made by hospitals for enhancing their ability to collect the data (e.g., anticipated use of electronic medical records).

## 2.5 Data Analyses

Survey responses were compiled and analyzed in Microsoft® Excel® 2007. A designated Litaker Group staff member with experience in research and evaluation was responsible for all data cleaning, manipulation, and analysis in this study.

Calculations included sums, proportions, averages, medians, minimum and maximum values. Only descriptive analyses were conducted with data collected for this study because of the small sample size and participant self-selection basis. No inferential analyses were attempted. Therefore, the power of the sample size was not determined.

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<sup>9</sup> National Quality Forum (NQF). Time-Limited Endorsement Policy. 2007.

<sup>10</sup> Calendar year 2008 was chosen as the data collection period for the public health evaluation project because the project began in March 2009; therefore calendar year 2008 data were the most recent data available for review.



Normally, inferential analyses such as regressions require 15 to 20 cases for each variable to be included, for a power of 0.80 and an alpha level of 0.05.<sup>11</sup>

Analyses of the data included consideration to NQF-specified criteria for a feasibility study (See [Section 1: Background](#)). Four of the 10 criteria in particular are discussed below (i.e., multi-site testing in a variety of settings, analysis of vaccination and refusal rates, analysis of excluded cases, and demonstration of reliability and validity). Findings for all 10 criteria are discussed in [Section 3: Results](#).

### 2.5.1 Multi-site testing in a variety of settings

Representation of hospitals that participated versus those that did not was determined based on comparisons of ownership type (i.e., for profit, not for profit, or public),<sup>12</sup> geographical area designation (i.e., urban or rural<sup>13</sup>), DSHS-designated health service region,<sup>14</sup> birth cohort, and number of licensed beds (See Section 3.1 and Table 3.1). Testing of the hepatitis B vaccination metric in various settings was not within the scope of this feasibility study.

### 2.5.2 Vaccination and refusal rates

The NQF hepatitis B vaccination metric (ID#0475)<sup>15</sup> is defined as follows:

$$\frac{\text{Number of newborns received hepatitis B vaccine prior to discharge from the hospital}}{\text{Number of live newborns discharged from the hospital minus those with guardian/parental refusals}}$$

Participants of this study were asked to estimate vaccination and refusal rates with survey items 3, 3a, 3b, 8, 8a, and 8b (See [Section 7: Appendix: Survey Tool](#) and [Section 3.2: Ability to Measure Vaccination or Refusal Rates](#)). The participants were asked to determine the number of neonates born in the calendar year 2008 who were vaccinated with hepatitis B prior to discharge in that calendar year, during any 12-month period, and/or other specified time period. Similarly, participants were asked how many newborns were not administered hepatitis B vaccine prior to discharge because of parental or guardian refusals. The number of live births in 2008 collected from the public health evaluation project was used as the denominator to calculate vaccination rates in this study. Hospitals that responded to the NQF survey provided the number of live

<sup>11</sup> Cohen J and Cohen P. Applied Multiple Regression / Correlation Analysis for the Behavioral Sciences – 2<sup>nd</sup> Edition. Hillsdale, New Jersey: Lawrence Erlbaum Associates Publishers. 1983.

<sup>12</sup> Ownership type was defined according to information provided for each facility in the DSHS Annual Hospital Survey (2008): ownership by corporation, partnership or private entity ("For profit"); ownership by Church or other not-for-profit corporation ("Not for profit"); or ownership by governmental agency ("Public"). Source: DSHS 2008 Annual Survey. <http://www.dshs.state.tx.us/chs/hosp/Forms/AHS08.pdf>. Accessed August 16, 2010.

<sup>13</sup> Urban hospitals were those located in metropolitan statistical areas, and rural hospitals were defined as those hospitals located in non-metropolitan cities, as defined in the annual survey. Source: DSHS 2008 Annual Survey. <http://www.dshs.state.tx.us/chs/hosp/Forms/AHS08.pdf>. Accessed August 16, 2010.

<sup>14</sup> Texas has been divided into 11 regions served by eight DSHS regional offices (See Appendix 8: Health Service Regions Map). Representation of hospitals in this feasibility study differed among the eight health service regions (Table 3.1). Therefore, this variable is included in this report to show the potential effect of variation among health service regions on the measure of hospital-based hepatitis B vaccination.

<sup>15</sup> National Quality Forum (NQF). National Voluntary Consensus Standards for Perinatal Care 2008: A Consensus Report. Washington, DC: NQF; 2009.

births for any alternate period data if they did not have data for 2008. The vaccination rates reported in this survey were compared to estimates from medical chart reviews of the public health evaluation project ([See Section 2.5.4: Demonstration of Reliability and Validity](#)).<sup>16</sup>

### 2.5.3 Analysis of excluded cases

The only exclusion criterion specified by NQF for the hepatitis B vaccination metric was parental or guardian refusal rate. This rate was used to calculate adjusted vaccination rates (See Section 2.5.2: Vaccination and Refusal Rates and Section 3.2: Ability to Measure Vaccination or Refusal Rates).

### 2.5.4 Demonstration of reliability and validity

Reliability and validity of using the hospital-based hepatitis B vaccination metric were examined through the following methods (Note: the public health evaluation project is also discussed to show comparability of the two different data sources):

- **Reproducibility of data:** The NQF study was conducted as part of the larger public health evaluation project so that results from the feasibility survey could be compared to results from the public health evaluation project. In addition, survey responses for the feasibility survey were requested for calendar year 2008 so that comparisons could be made to data collected for the public health evaluation project. Data abstracted from medical chart review for the public health evaluation project were used to measure concurrent validity.
- **Inter-rater and inter-respondent variability:** Data abstraction for the public health evaluation project was conducted using a data abstraction tool with data validation and training of Litaker Group staff members who conducted the chart reviews.<sup>17</sup> Inter-respondent variability for the feasibility study was controlled by the design of survey questions and use of checkbox responses wherever possible.

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<sup>17</sup> For hospitals that participated in the public health evaluation project, medical charts were selected using interval sampling based on the size of annual birth cohort for the entire calendar year of 2008. The number of medical charts to be reviewed was determined based on a 75% vaccination rate ( $\pm 8\%$ ) with a 95% confidence level.

### 3 Results

#### 3.1 Demographic Information on Respondent Hospitals

In the public health evaluation study, the number of paired charts reviewed ranged from 75 to 124 per hospital, with an average of 109 paired charts. Of the 119 eligible hospitals, 50 (42.0%) participated in this NQF feasibility study.

The distribution of the responding hospitals based on DSHS health service region (HSR) designation,<sup>18</sup> geographical area location, and ownership type is presented in Table 3.1. Range and median of licensed bed size and birth cohorts (total live births) are also presented in Table 3.1. Overall, both the larger number of hospitals that participated in the public health evaluation project and the subset of hospitals that responded to the feasibility survey were comparable based on demographic measures. To a small degree, not-for-profit hospitals and hospitals located in rural areas were underrepresented in both studies, and urban hospitals were overrepresented. Hospitals located in the southernmost region of Texas (DSHS HSR 11) were also overrepresented in both study groups because of the high incidence of cases of hepatitis B and high cases of infants born to HBsAg-positive mothers.<sup>19</sup> Thus a request was made to sample more hospitals in this region.

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<sup>18</sup> Given that Texas is a large state and there is a variation in representation among DSHS designated health service regions, this distribution is included in Table 3.1.

<sup>19</sup> Hospitals included in the public health evaluation project were selected based on a variety of factors including input from perinatal hepatitis B coordinators in the DSHS health service regions.



**Table 3.1:** Characteristics of hospitals that participated in the feasibility survey as compared to hospitals that participated in the public health evaluation project and hospitals statewide

|                             | Feasibility Study Participants | Feasibility Study Non-Participants | Public Health Evaluation Participants | Hospitals with Significant Births** Statewide |
|-----------------------------|--------------------------------|------------------------------------|---------------------------------------|---|
| Ownership type              | n (%)***                       | n (%)***                           | n (%)***                              | n (%)***                                      |
| For Profit                  | 18 (36.0)                      | 20 (29.0)                          | 38 (31.9)                             | 75 (33.3)                                     |
| Not for Profit              | 25 (50.0)                      | 37 (53.6)                          | 62 (52.1)                             | 98 (43.6)                                     |
| Public                      | 7 (14.0)                       | 12 (17.4)                          | 19 (16.0)                             | 45 (20.0)                                     |
| Geographic Area Designation |                                |                                    |                                       |   |
| Urban                       | 40 (80.0)                      | 63 (91.3)                          | 103 (86.6)                            | 160 (71.1)                                    |
| Rural                       | 10 (20.0)                      | 6 (8.7)                            | 16 (13.4)                             | 65 (28.9)                                     |
| DSHS HSR Designation        |                                |                                    |                                       |   |
| 1                           | 2 (4.0)                        | 4 (5.8)                            | 2 (1.7)                               | 14 (6.2)                                      |
| 2/3                         | 8 (16.0)                       | 24 (34.8)                          | 16 (13.4)                             | 58 (25.8)                                     |
| 4/5N                        | 5 (10.0)                       | 9 (13.0)                           | 4 (3.4)                               | 22 (9.8)                                      |
| 6/5S                        | 9 (18.0)                       | 27 (39.1)                          | 18 (15.1)                             | 45 (20.0)                                     |
| 7                           | 7 (14.0)                       | 14 (20.3)                          | 7 (5.9)                               | 26 (11.6)                                     |
| 8                           | 5 (10.0)                       | 15 (21.7)                          | 10 (8.4)                              | 25 (11.1)                                     |
| 9/10                        | 4 (8.0)                        | 9 (13.0)                           | 5 (4.2)                               | 16 (7.1)                                      |
| 11                          | 10 (20.0)                      | 17 (24.6)                          | 7 (5.9)                               | 19 (8.4)                                      |
| Total number of hospitals   | 50                             | 69                                 | 119                                   | 225   |
|                             | Mean (Range); Median           | Mean (Range); Median               | Mean (Range); Median                  | Mean (Range); Median                          |
| Licensed Bed Size           | 336 (19 – 1,049); 275          | 360 (42 – 1082); 326               | 350 (19 – 1,082); 308                 | 278 (17 – 1,763); 198                         |
| Birth Cohort*               | 2,263 (219 – 6,530); 2,012     | 2,589 (226-15,482); 2,337          | 2,452 (219 – 15,482); 2,179           | 1,800 (114 – 15,800); 1,166                   |

\* In the current study, "Birth Cohort" is defined as the total number of live births in 2008. Total birth cohort represented in feasibility study = 113,150, in public health evaluation project = 291,767, and statewide = 404,165. True birth cohort numbers are unavailable for the statewide hospital comparison group, as the data for these hospitals were derived from the 2008 DSHS Annual Hospital Survey. That instrument only collected the total number of deliveries, data for which are shown. Actual birth cohort numbers can be assumed to be higher due to multiple birth events. Assumed statewide birth cohort of 404,165 is based on a multiple birth event frequency of 1.03, as defined by the National Vital Statistics Reports, Volume 57, Number 7, January 7, 2009 (<http://www.cdc.gov/nchs/data/nvsr/nvsr57>) and Texas birth rates by race from the Summary of 2006 Vital Statistics (<http://www.dshs.state.tx.us/chs/vstat/latest/data.shtm#birth>).

\*\* A significant number of births are those from hospitals identified in the DSHS Annual Hospital Survey with greater than 100 deliveries per year (2008) and the Texas Healthcare Information Collection with greater than 30 cesarean births per year (2007).

\*\*\* Column percents.

### 3.2 Ability to Measure Vaccination or Refusal Rates

Hospitals were asked whether they are able to measure:

1. The number of neonates who received hepatitis B vaccination prior to discharge ([See Appendix: Survey Tool](#)); and
2. The number of neonates whose mother/parents declined vaccination (guardian refusal) ([See Appendix: Survey Tool](#)).

Results are presented in Table 3.2. Two hospitals reported having the ability to measure the number of newborns vaccinated and guardian refusals of vaccinations, but declined to do so, citing time burden for data collection too great for response. An additional hospital provided the number of vaccinated newborns, but declined to provide the number of guardian refusals of vaccination, citing excessive time burden to provide this information.

**Table 3.2:** Number and percent of participating hospitals that were able to measure the number of neonates administered hepatitis B vaccine prior to discharge and number of refusals

|                                       | Able to measure number of neonates vaccinated for hepatitis B prior to discharge | Able to measure the number of refusals for hepatitis B vaccination prior to discharge |
|---------------------------------------|--|---|
|                                       | n (%) <sup>a</sup>   | n (%) <sup>a</sup>  |
| Able <sup>a</sup>                     | 2 (4)  | 3 (6)   |
| No                                    | 12 (24)  | 31 (62)   |
| Yes (CY 2008 numbers)                 | 32 (64)  | 14 (28)   |
| Yes (Other time period <sup>b</sup> ) | 4 (10)   | 2 (4)   |
| Yes (Total) <sup>c</sup>              | 36 (72)  | 16 (32)   |

a. But declined to provide information

b. Other time periods provided: three provided numbers for vaccinations in CY 2009 and one provided a number for fiscal year (beginning September 2008); one provided a number for guardian refusals in CY2009, and one provided a number for its fiscal year

c. Total number of hospitals that participated =50

CY = Calendar Year

\* % = number / 50

### 3.3 Calculated Hepatitis B Vaccination Rate

The performance level for NQF measure #0475 is defined as vaccination of all newborns prior to discharge, with newborns whose guardian refused vaccination excluded from metric calculations.<sup>20</sup> Less than a quarter of the hospitals that could and would provide birth dose information (22%, n=8 of 36) achieved the metric-defined performance level (i.e., birth dose vaccination at 100%), when guardian refusals were not taken into account. When guardian refusal rates were considered (i.e., excluded from calculations), 63% of the hospitals surveyed that could provide the information (n=10 of 16) met metric-defined performance level (See Table 3.3 for individual hospital vaccination rates before and after exclusions).

<sup>20</sup> National Quality Forum (NQF). National Voluntary Consensus Standards for Perinatal Care 2008: A Consensus Report. Washington, DC: NQF; 2009.



**Table 3.3:** Vaccination rate and adjusted for refusal vaccination rate based on reported data from participating hospitals

| Hospital ID | Ability to Calculate Refusal Rate* | Vaccination Rate (%) | Vaccination Rate Adjusted for Refusals (%) |
|-------------|------------------------------------|----------------------|--|
| 1           | No                                 | 73                   | -  |
| 2           | No                                 | 75                   | -  |
| 3           | No                                 | 100                  | -  |
| 4           | No                                 | 19                   | -  |
| 5           | No                                 | 70                   | -  |
| 6           | No                                 | 97                   | -  |
| 7           | No                                 | 88                   | -  |
| 8           | No                                 | 93                   | -  |
| 9           | No                                 | 83                   | -  |
| 10          | No                                 | 69                   | -  |
| 11          | No                                 | 101                  | -  |
| 12          | No                                 | 99                   | -  |
| 13          | No                                 | 97                   | -  |
| 14          | No                                 | 72                   | -  |
| 15          | No                                 | 94                   | -  |
| 16          | No                                 | 98                   | -  |
| 17          | No                                 | 96                   | -  |
| 18          | No                                 | 91                   | -  |
| 19          | No                                 | 94                   | -  |
| 20          | Declined                           | 100                  | -  |
| 21          | Yes                                | 98                   | 98   |
| 22          | Yes                                | 100                  | 100  |
| 23          | Yes                                | 8                    | 8  |
| 24          | Yes                                | 75                   | 100  |
| 25          | Yes                                | 100                  | 100  |
| 26          | Yes                                | 95                   | 96   |
| 27          | Yes                                | 100                  | 100  |
| 28          | Yes                                | 81                   | 100  |
| 29          | Yes                                | 95                   | 99   |
| 30          | Yes                                | 94                   | 95   |
| 31          | Yes                                | 95                   | 100  |
| 32          | Yes                                | 90                   | 100  |
| 33          | Yes                                | 84                   | 93   |
| 34          | Yes                                | 107                  | 107  |
| 35          | Yes                                | 100                  | 100  |
| 36          | Yes                                | 96                   | 101*                                       |

n = 36 hospitals reported being able to calculate vaccination rate, n=16 hospitals reported being able to provide guardian refusal rate in addition to vaccination rate

Yes=Ability of hospital to measure this metric; No=Inability of hospital to measure this metric; Declined=Ability to measure, but hospital declined to provide the number for this metric;

Vaccination Rate=Number of reported vaccinations / number of live births in CY 2008 or alternate time period

Adjusted Vaccination Rate=Number of reported vaccinations / number of live births in CY 2008 or alternate time period minus number of refusals.

\*Some rates were >100% due to artifacts in using data collected from different sources.



### 3.4 Challenges in Determining Vaccination and Refusal Rates

Respondent hospitals reported having faced challenges in determining the number of neonates vaccinated with hepatitis B vaccine (n=18, 36%) or refusals for hepatitis B vaccination prior to discharge (n=35, 70%). Some hospitals cited no challenges in determining either number (n=14, 28%). Seventeen hospitals (34%) cited having challenges determining both the number of neonates vaccinated and number of vaccinations refused.

#### 3.4.1 Number of newborns vaccinated

Two thirds of all respondent hospitals (n=32 of 50) were able to provide data for newborns vaccinated with hepatitis B in 2008 (Table 3.4). Nearly all respondents who could provide data for the number of newborns vaccinated in 2008 did not cite challenges for obtaining the number of vaccinated (n=31/32, 97%). One hospital that provided data for a time period other than calendar year 2008 did not cite any challenges. Three hospitals that provided data for an alternate time period cited challenges to providing 2008 data. These hospitals cited information management (n=2, e.g., lack of data field in electronic medical record (EMR) or lack of appropriate EMR query), time burden (n=1, e.g., for reviewing paper records), and record accessibility (n=2, e.g., lack of immediate access to medical records because of off-site storage or separate departments) as challenges. The 14 hospitals that could not provide any data cited information management, time burden, and lack of or limited record accessibility as challenges. In Table 3.4, the hospitals could cite more than one challenge or could decline to cite any challenges. Therefore, the number of hospitals citing each challenge may be greater than the total column numbers.

**Table 3.4:** The types of challenges reported by respondent hospitals in the inability to determine rates for hepatitis B immunization

| Challenge Cited to Providing CY2008 Vaccination Information | Provided 2008 Data | Provided Alternate Time Period Data | Could Not Provide Any Data |
|---|--------------------|-------------------------------------|----------------------------|
|   | n (%)*             | n (%)*                              | n (%)*                     |
| Information management                                      | 1 (3)              | 2 (50)                              | 9 (64)                     |
| Time burden   | 0 (0)              | 1 (25)                              | 10 (71)                    |
| Record accessibility  | 0 (0)              | 2 (50)                              | 1 (7)                      |
| None  | 31 (97)            | 1 (25)                              | 0 (0)                      |

n = Number of hospitals to cite challenge. Hospitals could cite more than one challenge, or could decline to cite any.

\*Total number of hospitals = 50

\* Column percents

#### 3.4.2 Number of newborns with guardian refusals

Nearly 30% of all respondent hospitals provided data for newborns whose guardians or parents refused hepatitis B vaccination in 2008 (n=14) (Table 3.5). None of the hospitals cited any challenges. Two hospitals provided data for an alternate period, with one hospital citing record accessibility as a challenge. Hospitals that could not provide any data cited information management, time burden, and record accessibility as challenges.



In Table 3.5, the hospitals could cite more than one challenge or could decline to cite any challenges. Therefore, the number of hospitals citing each challenge may be greater than the total column numbers.

**Table 3.5:** The types of challenges reported by respondent hospitals in the inability to determine guardian refusal rates for hepatitis B immunization

| Challenge Cited to Providing CY2008 Guardian Refusal Information | Provided 2008 Data | Provided Alternate Time Period Data | Could Not Provide Data |
|--|--------------------|-------------------------------------|------------------------|
|  | n (%)*             | n (%)*                              | n (%)*                 |
| Information management   | 0 (0)              | 0 (0)                               | 34 (100)               |
| Time burden  | 0 (0)              | 0 (0)                               | 4 (12)                 |
| Record accessibility   | 0 (0)              | 1 (50)                              | 5 (15)                 |
| None   | 14 (100)           | 1 (50)                              | 0 (0)                  |

n = Number of hospitals to cite challenge. Hospitals could cite more than one challenge, or could decline to cite any.

\*Total number of hospitals = 50

\* Column percents

Hospitals cited a variety of challenges in providing vaccination and guardian refusal information. Tables 3.6 and 3.7 provide descriptive analyses of hospital ability to provide this information by ownership type and geographical area designation.

**Table 3.6:** Distribution of hospitals by ability to provide hepatitis B vaccination data by business ownership, geographical setting, and hospital size metrics

|                               | Provided 2008 Data  | Provided Alternate Time Period Data | Could Not Provide Any Data |
|-------------------------------|---------------------|-------------------------------------|----------------------------|
| Ownership Type                | n (%)*              | n (%)*                              | n (%)*                     |
| For Profit                    | 10 (31)             | 2 (50)                              | 6 (43)                     |
| Not for Profit                | 16 (50)             | 2 (50)                              | 7 (50)                     |
| Public                        | 6 (19)              | 0 (0)                               | 1 (7)                      |
| Geographical Area Designation |                     |                                     |                            |
| Urban                         | 23 (72)             | 4 (100)                             | 13 (93)                    |
| Rural                         | 9 (28)              | 0 (0)                               | 1 (7)                      |
| Total number of hospitals     | 32                  | 4                                   | 14                         |
|                               | Mean (Range)        | Mean (Range)                        | Mean (Range)               |
| Licensed Bed Size             | 335 (19 – 1,049)    | 273 (178 – 320)                     | 356 (100 – 936)            |
| Birth Cohort**                | 1,943 (219 – 4,907) | 3,289 (738 – 6,530)                 | 2,702 (757 – 5,433)        |

\* Column percents

\*\*Birth Cohort: total annual live births in provided data. Total Birth cohort in those hospitals providing 2008 data= 62,173; those providing alternate time period data =13,156, those not able to provide data = 37,821.

**Table 3.7:** Distribution of hospitals by ability to provide hepatitis B vaccination guardian refusal data by business ownership, geographical setting, and hospital size metrics

|                               | Provided 2008 Data  | Provided Alternate Time Period Data | Could Not Provide Any Data |
|-------------------------------|---------------------|-------------------------------------|----------------------------|
| Ownership Type                | n (%)*              | n (%)*                              | n (%)*                     |
| For Profit                    | 4 (29%)             | 1 (50%)                             | 13 (38%)                   |
| Not for Profit                | 8 (57%)             | 1 (50%)                             | 16 (47%)                   |
| Public                        | 2 (14%)             | 0 (0%)                              | 5 (15%)                    |
| Geographical Area Designation |                     |                                     |                            |
| Urban                         | 9 (64%)             | 2 (100%)                            | 29 (85%)                   |
| Rural                         | 5 (36%)             | 0 (0%)                              | 5 (15%)                    |
| Total number of hospitals     | 14                  | 2                                   | 34                         |
|                               | Mean (Range)        | Mean (Range)                        | Mean (Range)               |
| Licensed Bed Size             | 266 (49 – 660)      | 296 (280 – 312)                     | 366 (19 – 1,049)           |
| Birth Cohort**                | 1,460 (219 – 4,907) | 4,595 (2,659 – 6,530)               | 2,456 (287 – 5,433)        |

\* Column percents

\*\*Birth Cohort: total annual live births in provided data. Total birth cohort in those hospitals providing 2008 vaccine refusal data= 20,444; those providing alternate time period data =9,189, those not able to provide data = 83,517

### 3.5 Planned Changes That May Facilitate Ability to Provide Data

Hospitals were asked to provide information about upcoming changes in infrastructure or processes that would enable them to provide data on the number of hepatitis B vaccinations to neonates before discharge (See Table 3.8). There was a larger number of hospitals that could provide vaccination rates than hospital that could not that reported anticipating changes (i.e., adopt the use of electronic medical records, upgrade to electronic medical records or develop non-EMR based reports or databases). These reported anticipated changes would allow the hospitals to continue or begin providing hepatitis B vaccination data. There was also a larger number of hospitals that provided data than those that could not that reported not anticipating any changes.

**Table 3.8:** Number of hospitals that listed anticipated changes for facilitating data reporting

| Anticipated Change                                | Hospitals Not Providing Rates (n) | Hospitals Providing Rates (n) | Total n (%)* |
|---|-----------------------------------|-------------------------------|--------------|
| Adoption of electronic medical record             | 1                                 | 7                             | 8 (16)       |
| Upgrade of current electronic medical record      | 4                                 | 9                             | 13 (26)      |
| Development of non-EMR based reports or databases | 1                                 | 2                             | 3 (6)        |
| None identified                                   | 8                                 | 18                            | 26 (52)      |

Total number of hospitals = 50

\* % = Number / 50

### 3.6 Time Burden to Collect Data for this Metric

Participating hospitals were asked to estimate the time burden for collecting data (See Table 3.9). Hospitals that used paper records reported a mean time of data collection of 10.1 hours compared to 3.7 hours for hospitals with an entirely electronic medical record system. For three hospitals that accessed records in a mixed format of both electronic and paper, the mean time to collect data was 3.1 hours.

**Table 3.9:** Time in hours to determine number of neonates vaccinated with hepatitis B prior to discharge by retrieval method

| Retrieval Method                            | n         | Mean (Hours) | Median (Hours) | Minimum (Hours) | Maximum (Hours) |
|---|-----------|--------------|----------------|-----------------|-----------------|
| Paper record                                | 15        | 10.1         | 1.0            | 0.2             | 72.0            |
| Electronic medical record                   | 12        | 3.7          | 1.0            | 0.2             | 30.0            |
| Mixed paper and electronic records          | 3         | 3.1          | 1.0            | 0.2             | 8.0             |
| Electronic archive of paper record          | 1         | --           | --             | 1.0             | 1.0             |
| No information provided on retrieval method | 3         | 3.0          | 4.0            | 1.0             | 4.0             |
| <b>Total</b>                                | <b>34</b> | <b>6.3</b>   | <b>1.0</b>     | <b>0.2</b>      | <b>72.0</b>     |

n = Number of hospitals



### 3.7 Direct or Indirect Costs Associated with Data Collection

A subset of respondents provided data on the direct and indirect costs associated with data collection. Table 3.10 provides a summary of estimated cost burden, and Table 3.11 provides a summary of cost by method of data retrieval.

**Table 3.10:** Direct and indirect costs to determine number of neonates vaccinated with hepatitis B prior to discharge

| Cost  | n  | Mean      | Median    | Minimum | Maximum     |
|---|----|-----------|-----------|---------|-------------|
| Direct cost to determine vaccination rate   | 6  | \$ 65.00  | \$ 25.00  | \$ 0.00 | \$ 240.00   |
| Indirect cost to determine vaccination rate | 11 | \$ 303.30 | \$ 100.00 | \$ 0.00 | \$ 1,650.00 |
| Direct cost to determine refusal rate       | 5  | \$ 594.00 | \$ 10.00  | \$ 0.00 | \$ 2,000.00 |
| Indirect cost to determine refusal rate     | 6  | \$ 136.33 | \$ 26.50  | \$ 0.00 | \$ 725.00   |

Direct cost=Actual cost to retrieve records

Indirect cost= Cost of resource hours to retrieve records

n =Number of hospitals, n = 13 (The hospitals that could provide one or both the direct and indirect cost so the total number of hospitals providing any data = 13)

Note: One respondent noted a cost of greater than \$50,000 as a direct cost for data retrieval. Presumably, this was a cost for the full-time equivalent employee salary to provide this information. This data point was considered an outlier and was not included in the data analysis.

**Table 3.11:** Total cost to determine number of neonates vaccinated with hepatitis B prior to discharge by retrieval method

| Retrieval Method                            | n         | Mean             | Median           | Minimum     | Maximum            |
|---|-----------|------------------|------------------|-------------|--------------------|
| Paper record                                | 6         | \$ 336.83        | \$ 117.50        | \$ 56.00    | \$ 1,450.00        |
| Electronic medical record                   | 5         | \$ 970.00        | \$ 1,160.00      | \$ 0.00     | \$ 2,000.00        |
| Mixed paper and electronic records          | 0         | --               | --               | --          | --                 |
| Electronic archive of paper record          | 0         | --               | --               | --          | --                 |
| No information provided on retrieval method | 2         | \$ 170.00        | \$ 240.00        | \$ 100.00   | \$ 240.00          |
| <b>Total</b>                                | <b>13</b> | <b>\$ 554.69</b> | <b>\$ 135.00</b> | <b>\$ -</b> | <b>\$ 2,000.00</b> |

n=Number of hospitals

### 3.8 Validity of Data Provided by Respondents

The validity of data collected was determined by comparing rates of vaccination reported by hospitals through the feasibility survey (n=36/50) and rates of vaccination calculated from the same hospitals by reviewing a sample of medical records in the larger public health evaluation study. Validity of data collected by the feasibility study as compared to data collected by the public health evaluation study is summarized in Tables 3.12 and 3.13 and Figures 3.1 and 3.2. Most rates as determined by the hospitals (Table 3.12, Columns C and F) fell within  $\pm 10\%$  of rates determined by the medical chart review in the public health evaluation study (Columns D and G).



**Table 3.12:** Comparison of data collected by the feasibility study and data collected by the public health evaluation study

| (A)<br>FS Ability to<br>Calculate<br>Vaccination<br>Rate | (B)<br>FS Ability to<br>Calculate<br>Refusal<br>Rate | Unadjusted Vaccination Rate |            |  | Adjusted Vaccination Rate to<br>Account for Refusal |            |   |
|--|--|-----------------------------|------------|--|---|------------|---|
|  |  | (C)<br>FS                   | (D)<br>PHE | (E)<br>Difference<br>between FS<br>and PHE | (F)<br>FS   | (G)<br>PHE | (H)<br>Difference<br>between<br>FS and<br>PHE |
| 1. Yes   | No   | 73%                         | 70%        | 2%   | -   | 77%        | -   |
| 2. Yes   | No   | 75%                         | 76%        | -1%  | -   | 77%        | -   |
| 3. Yes   | No   | 100%                        | 99%        | 1%   | -   | 100%       | -   |
| 4. Yes   | No   | 19%                         | 89%        | -70%                                       | -   | 92%        | -   |
| 5. Yes   | No   | 70%                         | 93%        | -23%                                       | -   | 100%       | -   |
| 6. Yes   | No   | 97%                         | 98%        | -2%  | -   | 99%        | -   |
| 7. Yes   | No   | 88%                         | 91%        | -3%  | -   | 91%        | -   |
| 8. Yes   | No   | 93%                         | 97%        | -5%  | -   | 98%        | -   |
| 9. Yes   | No   | 83%                         | 56%        | 27%  | -   | 58%        | -   |
| 10. Yes  | No   | 69%                         | 70%        | -1%  | -   | 70%        | -   |
| 11. Yes  | No   | 101%                        | 98%        | 3%   | -   | 98%        | -   |
| 12. Yes  | No   | 99%                         | 99%        | -1%  | -   | 100%       | -   |
| 13. Yes  | No   | 97%                         | 73%        | 24%  | -   | 90%        | -   |
| 14. Yes  | No   | 72%                         | 72%        | 0%   | -   | 72%        | -   |
| 15. Yes  | No   | 94%                         | 99%        | -5%  | -   | 100%       | -   |
| 16. Yes  | No   | 98%                         | 97%        | 1%   | -   | 97%        | -   |
| 17. Yes  | No   | 96%                         | 100%       | -4%  | -   | 100%       | -   |
| 18. Yes  | No   | 91%                         | 96%        | -5%  | -   | 97%        | -   |
| 19. Yes  | No   | 94%                         | 96%        | -2%  | -   | 96%        | -   |
| 20. Yes  | Declined   | 100%                        | 94%        | 6%   | -   | 97%        | -   |
| 21. Yes  | Yes  | 84%                         | 89%        | -5%  | 93%   | 98%        | -5%   |
| 22. Yes  | Yes  | 100%                        | 100%       | -2%  | 100%  | 100%       | -2%   |
| 23. Yes  | Yes  | 98%                         | 100%       | -2%  | 98%   | 100%       | -2%   |
| 24. Yes  | Yes  | 8%                          | 100%       | -92%                                       | 8%  | 100%       | -92%  |
| 25. Yes  | Yes  | 75%                         | 94%        | -19%                                       | 100%  | 97%        | 3%  |
| 26. Yes  | Yes  | 100%                        | 99%        | 1%   | 100%  | 99%        | 1%  |
| 27. Yes  | Yes  | 95%                         | 97%        | -3%  | 96%   | 98%        | -2%   |
| 28. Yes  | Yes  | 100%                        | 99%        | 1%   | 100%  | 99%        | %   |
| 29. Yes  | Yes  | 81%                         | 80%        | 1%   | 100%  | 80%        | 20%   |
| 30. Yes  | Yes  | 95%                         | 91%        | 4%   | 99%   | 93%        | 6%  |
| 31. Yes  | Yes  | 94%                         | 94%        | 0%   | 95%   | 95%        | -1%   |
| 32. Yes  | Yes  | 95%                         | 96%        | -1%  | 100%  | 97%        | 3%  |
| 33. Yes  | Yes  | 90%                         | 98%        | -8%  | 100%  | 98%        | 2%  |
| 34. Yes  | Yes  | 107%                        | 99%        | 8%   | 107%  | 99%        | 8%  |
| 35. Yes  | Yes  | 101%                        | 99%        | 2%   | 101%  | 99%        | 2%  |
| 36. Yes  | Yes  | 96%                         | 95%        | 2%   | 101%  | 97%        | 4%  |

n=36 Hospitals; Yes=Ability of hospital to measure this metric; No=Inability of hospital to measure this metric; Declined=Hospital was able but declined to provide this metric; Vaccination Rate=Number of reported vaccinations / number of live births in CY 2008 or alternate time period; Adjusted Vaccination Rate= Number of reported vaccinations / number of live births in CY 2008 or alternate time period minus number of refusals. Some rates were >100% due to artifacts in using data collected from different sources. All rates and differences rounded to the nearest whole number.

\* Note: In Column (G) (Lines 1-20) refusal rates were identified during the medical chart review in accordance with the protocol established for the DSHS public health evaluation study. There were no corresponding data reported from the feasibility study for comparison.

FS=Feasibility Study; PHE=Public Health Evaluation

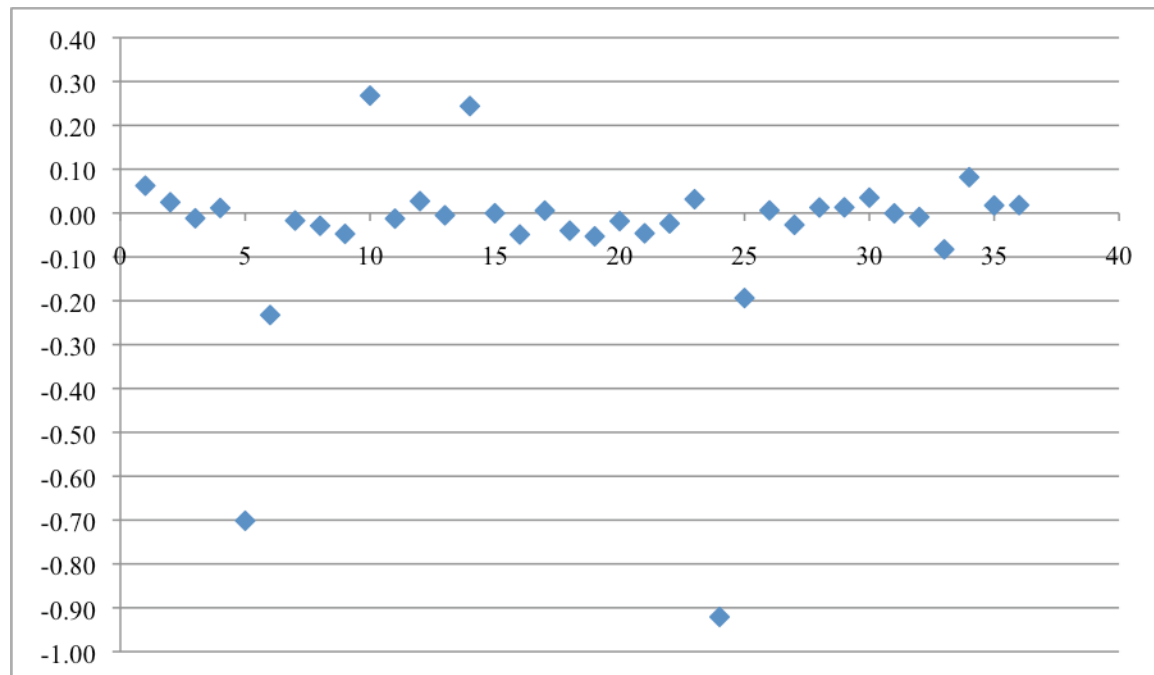


**Table 3.13:** Vaccination rate variations

| Rate Difference           | n  | Mean  | Median | Standard Deviation |
|---------------------------|----|-------|--------|--------------------|
| Vaccination rate          | 36 | -5.0% | -1.0%  | 21.0%              |
| Adjusted vaccination rate | 16 | -3.0% | 2.0%   | 24.0%              |

n=Number of hospitals; Adjusted vaccination rate=Number vaccinated divided by (total birth cohort minus refusals)

**Figure 3.1:** Difference between respondent-based feasibility assessment and on-site medical chart review in public health evaluation study for non-adjusted vaccination rates

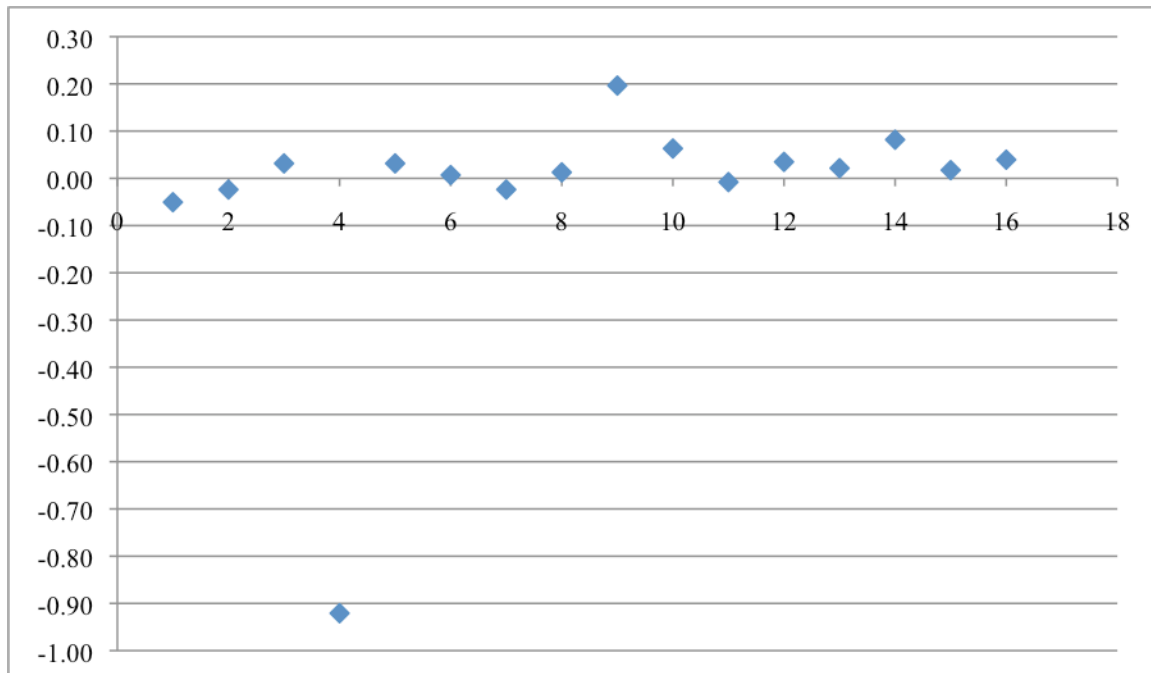


n = Represents all 36 hospital respondents who provided data through the feasibility study to calculate vaccination rates as compared to medical chart data for these same hospitals

Note: Hospitals that are outliers in the graph either reported no challenges for accurate vaccination reporting, did not track refusals, or cited time burden for review of paper records as a challenge.



**Figure 3.2:** Difference between respondent-based feasibility assessment and on-site medical chart review in public health evaluation study for adjusted vaccination rates



n = Represents the 16 hospital respondents who provided refusal data through the feasibility study to calculate vaccination rates as compared to medical chart data for these same hospitals  
 Note: Hospitals that are outliers in the graph either reported no challenges for accurate vaccination reporting, did not track refusals, or cited time burden for review of paper records as a challenge.

### 3.9 Data Sources for Responses to the Feasibility Study

The types of data sources used to determine the numbers of neonates vaccinated varied by facility (Tables 3.14 and 3.15). Some used single sources (Table 3.14) while others indicated that they used up to four different data sources (Table 3.15). Hospitals with outlier rate determinations used the same types of sources as other hospitals that had more accurate determinations. Factors accounting for the outliers cannot be determined from the data collected and are not known.

**Table 3.14:** Single data source use for determination of hepatitis B vaccination rates with and without adjustment for guardian refusals, by variation from medical chart-based rate for accuracy estimation

| Single Data Source          | Vaccination Rate Accuracy |        |        | Adjusted Vaccination Rate Accuracy |        |        |
|-----------------------------|---------------------------|--------|--------|------------------------------------|--------|--------|
|                             | +/-0.10                   | >+0.10 | <-0.10 | +/-0.10                            | >+0.10 | <-0.10 |
| Pharmacy (n)                | 6                         |        | 1      |                                    |        |        |
| MAR (n)                     | 1                         |        | 1      |                                    |        | 1      |
| Claims (n)                  | 1                         |        |        |                                    |        |        |
| Clinical Database (n)       | 3                         | 2      |        | 1                                  |        |        |
| Vaccine Consent (n)         |                           |        |        | 1                                  |        |        |
| Delivery Logs (n)           | 4                         |        |        | 3                                  | 1      |        |
| Unspecified EMR (n)         | 2                         |        |        | 1                                  |        |        |
| State Registry (n)          | 2                         |        |        | 1                                  |        |        |
| <b>n with Single Source</b> | <b>23</b>                 |        |        | <b>9</b>                           |        |        |

MAR = Medication administration record; EMR = Electronic medical record; n = Number of hospitals

**Table 3.15:** Multiple data source use for determination of hepatitis B vaccination rates with and without adjustment for guardian refusals, by variation from medical chart-based rate for accuracy estimation

| Multiple Data Source                                    | Vaccination Rate Accuracy |        |        | Adjusted Vaccination Rate Accuracy |        |        |
|---|---------------------------|--------|--------|------------------------------------|--------|--------|
|   | +/-0.10                   | >+0.10 | <-0.10 | +/-0.10                            | >+0.10 | <-0.10 |
| Pharmacy + Delivery Log (n)                             | 1                         |        |        | 1                                  |        |        |
| Pharmacy + State Registry (n)                           |                           |        | 1      |                                    |        | 1      |
| Pharmacy + Vaccine Consent + Nurses Notes (n)           | 1                         |        |        |                                    |        |        |
| Pharmacy + MAR (n)                                      | 2                         |        |        |                                    |        |        |
| Pharmacy + MAR + Vaccine Consent (n)                    | 1                         |        |        |                                    |        |        |
| MAR + Vaccine Consent (n)                               | 1                         |        |        |                                    |        |        |
| MAR + Vaccine Consent + Delivery Log (n)                | 1                         |        |        |                                    |        |        |
| MAR + Vaccine Consent + Nurses Notes + Delivery Log (n) | 2                         |        |        |                                    |        |        |
| MAR+ Delivery Log (n)                                   |                           |        |        | 1                                  |        |        |
| Pharmacy + Delivery Log (n)                             |                           |        |        | 1                                  |        |        |
| MAR + Pharmacy + Nurses Notes (n)                       |                           |        |        | 1                                  |        |        |
| Vaccine Consent + Nurses Notes (n)                      |                           |        |        | 1                                  |        |        |
| MAR + Vaccine Consent + Nurses Notes (n)                |                           |        |        | 1                                  |        |        |
| <b>n with Multiple Sources</b>                          | <b>10</b>                 |        |        | <b>7</b>                           |        |        |

MAR = Medication administration record; EMR = Electronic medical record; n = Number of hospitals

### 3.10 Effects of Patient Characteristics on Outcome Measure Calculations

Individual patient information was not collected in this feasibility study, and no risk adjustment or stratification of data by patient characteristic was made. However, the data collected during the medical chart review of the public health evaluation study were reviewed for possible patient-related factors that might influence the outcome of hepatitis B vaccination before discharge. The results are presented in the following tables:

- Table 3.16 shows adjusted vaccination rates (guardian refusals removed from the denominator of newborns discharged from the hospital) by race/ethnicity of the mother.
- Table 3.17 shows the adjusted vaccination rates by gestational age of the neonate.
- Table 3.18 shows the adjusted vaccination rates by neonatal birth weight.
- All of the proportions shown in Tables 3.16 – 3.18 are for all 119 participating hospitals in the perinatal hepatitis B public health evaluation study, and the rate proportions are calculated based on the sum of the statistical weights (total charts reviewed divided by the total birth cohort of the hospital).

**Table 3.16:** Medical chart based on adjusted neonatal hepatitis B vaccination rate by race/ethnicity of mother

| Mother's Race/Ethnicity   | Adjusted Vaccination Rate (Statistical Weight) | n             | Total n       |
|---------------------------|--|---------------|---------------|
| African American          | 93%  | 1,379         | 1,488         |
| American Indian/Alaskan   | 75%  | 14            | 16            |
| Asian                     | 92%  | 259           | 282           |
| Hawaiian/Pacific Islander | 85%  | 20            | 24            |
| Hispanic                  | 95%  | 5,128         | 5,425         |
| Multiracial               | 98%  | 10            | 11            |
| No data entered           | 99%  | 44            | 45            |
| Not recorded              | 95%  | 155           | 160           |
| Other                     | 93%  | 336           | 357           |
| Unknown                   | 94%  | 217           | 232           |
| White                     | 90%  | 4,189         | 4,642         |
| <b>Total</b>              | <b>93%</b>                                     | <b>11,751</b> | <b>12,682</b> |

n = Number of neonates

**Table 3.17:** Medical chart based on adjusted neonatal hepatitis B vaccination rate by gestational age of neonate

| Gestational Age (Weeks) | Adjusted Vaccination Rate (Statistical Weight) | n             | Total n       |
|-------------------------|--|---------------|---------------|
| 20                      | 34%  | 1             | 2             |
| 21                      | 0%   | -             | 2             |
| 22                      | 0%   | -             | 1             |
| 23                      | 22%  | 1             | 6             |
| 24                      | 84%  | 7             | 10            |
| 25                      | 55%  | 9             | 16            |
| 26                      | 73%  | 6             | 11            |
| 27                      | 92%  | 9             | 13            |
| 28                      | 79%  | 16            | 26            |
| 29                      | 85%  | 21            | 29            |
| 30                      | 90%  | 23            | 30            |
| 31                      | 78%  | 31            | 43            |
| 32                      | 86%  | 61            | 74            |
| 33                      | 93%  | 89            | 100           |
| 34                      | 89%  | 183           | 210           |
| 35                      | 92%  | 298           | 329           |
| 36                      | 91%  | 578           | 628           |
| 37                      | 93%  | 1,348         | 1,433         |
| 38                      | 92%  | 2,864         | 3,098         |
| 39                      | 94%  | 3,304         | 3,546         |
| 40                      | 94%  | 1,900         | 2,042         |
| 41                      | 95%  | 440           | 464           |
| 42                      | 98%  | 47            | 48            |
| 43                      | 100%   | 4             | 4             |
| 45                      | 100%   | 1             | 1             |
| <b>Total</b>            | <b>93%</b>                                     | <b>11,241</b> | <b>12,166</b> |

n = Number of neonates



**Table 3.18:** Medical chart based on adjusted neonatal hepatitis B vaccination rate by birth weight (grams) of neonate

| Birth Weight | Adjusted Vaccination Rate<br>(Statistical Weight) | n             | Total n       |
|--------------|---|---------------|---------------|
| 0-500        | 75%   | 18            | 25            |
| 500-1,000    | 64%   | 31            | 61            |
| 1,000-1,500  | 84%   | 86            | 114           |
| 1,500-2,000  | 87%   | 177           | 217           |
| 2,000-2,500  | 92%   | 669           | 737           |
| 2,500-3,000  | 94%   | 2,593         | 2,751         |
| 3,000-3,500  | 93%   | 4,837         | 5,170         |
| 3,500-4,000  | 93%   | 2,698         | 2,920         |
| 4,000-4,500  | 95%   | 571           | 608           |
| 4,500-5,000  | 93%   | 59            | 66            |
| 5,000-5,500  | 92%   | 10            | 11            |
| 5,500-6,000  | 100%  | 1             | 1             |
| 6,500-7,000  | 100%  | 1             | 1             |
| <b>Total</b> | <b>93%</b>  | <b>11,751</b> | <b>12,682</b> |

n = Number of neonates

### 3.11 Summary of Key Findings

This feasibility study demonstrated the following:

- Data were derived from 50 hospitals that are representative of labor and delivery hospitals in Texas.
- The reproducibility of the NQF hepatitis B vaccination measure was demonstrated by vaccination rates calculated based on hospital reported rates and vaccination rates from medical chart reviews for the public health evaluation study.
- The sample size of 50 hospitals represented an overall annual birth cohort of over 100,000 births. Information was provided on vaccination rates from an annual birth cohort representing over 62,000 births. Information on exclusions due to guardian refusals was provided from an annual birth cohort of over 30,000 births. Hospitals that could not or did not provide any information on vaccination and/or refusal rates represented the remaining portion of the study cohort.
- When guardian refusals were excluded from analysis – as allowed under the definition for this metric, the level of universal vaccination rate increased from 5 of 16 (31%) to 10 of 16 (63%) for hospitals capable of responding to both variables in this metric.
- Respondent hospitals cited information management practices as a challenge for obtaining data to calculate the hepatitis B vaccination metric, including data for guardian refusal rates.
- Variation was observed in baseline performance of the measure across hospitals, with the calculated measure ranging from 8-100%. Sixty-three percent of providers who could provide information for the complete calculation of the measure met the standard of 100% vaccination.
- Estimations of time and cost burden for determining the hepatitis B vaccination measure varied widely among hospitals. Time burdens were highest for facilities that did not use an electronic medical record system.
- Analysis of data for the hospital-based measure compared to estimates derived from medical chart review showed a variance of  $\pm 10\%$  for most of the hospitals (30/36). Most hospitals obtained their information from multiple data sources, with the most common source being pharmacy records.
- The measure was not risk adjusted, either in the hospital-based calculations or in the medical chart-based calculations, for any patient characteristic. Vaccination rates as measured in the public health evaluation study showed some variation by both gestational age and birth weight, with pre-term, newborns weighing less than 2000 grams having lower vaccination rates as compared to term, normal weight babies.



### 3.12 Limitations

The results from this study should be interpreted in consideration of the following limitations. One limitation is responder bias (i.e., those who could favorably measure vaccination rates chose to respond whereas those without the capacity to self-measure vaccination rates chose not to participate). When encouraged to participate by e-mail reminder, several hospitals responded that they had declined participation initially because they could not measure vaccine administration rates. They were encouraged to complete the survey so that their inability to measure vaccination rates and the challenges they faced could be captured. There are no documented open-ended responses collected from non-participating hospitals. Reasons for why other hospitals did not participate or respond are unknown. No adjustments were made to the data from this study for non-response.

Calculations included sums, proportions, averages, medians, minimum and maximum values. Only descriptive analyses were conducted for this study because of the small sample size and participant self-selection basis. No inferential analyses were attempted; therefore, the power of the sample size was not determined. Normally, inferential analyses such as regressions require 15 to 20 cases for each variable to be included, for a power of 0.80 and an alpha level of 0.05.<sup>21</sup>

The hospitals that participated in this survey were all participants in the hepatitis B public health evaluation study in Texas. The limitations of hospital representation in that study are therefore also pertinent to this study. The hospitals in the public health evaluation study represented a fairly balanced statewide sampling of all hospitals in Texas with significant labor and delivery services, but they were not a random selection of hospitals.

Further, Texas might not be fully representative of the United States. Hepatitis B birth dose coverage in Texas based on the National Immunization Survey for children born in 2005-2007 was 67% whereas statewide estimates of birth dose coverage varied from 19% to 78%.<sup>22</sup> Thus, variability within hospitals and the ability to self-measure vaccination rates across the nation might be greater than represented in this feasibility study.

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<sup>21</sup> Cohen J and Cohen P. *Applied Multiple Regression / Correlation Analysis for the Behavioral Sciences* – 2<sup>nd</sup> Edition. Hillsdale, New Jersey: Lawrence Erlbaum Associates Publishers. 1983.

<sup>22</sup> National, state, and local area vaccination coverage among children aged 19-35 months - United States, 2008. *MMWR* 2009;58(33):921-6



## 4 Conclusions

For the majority of hospitals responding to this feasibility study, the measurement of the rate of hepatitis B vaccine administration was a feasible endeavor. Only a few hospitals were able to measure guardian refusal rates. For hospitals where refusals occur at significant rates, the inability to measure refusals will impact whether a given hospital has an accurate measure of first birth dose administration rates for hepatitis B.

Given the current trend of increased implementation of electronic medical records in health care systems, the ability of hospitals to measure numbers of live newborns who received hepatitis B vaccination prior to discharge may improve over time. Increasing awareness of hepatitis B vaccination as a quality metric for hospitals will allow thoughtful implementation of appropriate data fields and queries for relevant information, such as for documentation of guardian refusals.





## 5 Appendix: Methods for Public Health Evaluation Project

The following sections describe the method selection process for the public health evaluation project entitled *Public Health Evaluation Project – Assessing Hospital Policies and Practices of Hepatitis B, HIV, Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008*.<sup>23</sup> It is included in this report to provide the context in which the feasibility study was conducted.

Three types of data were collected for the public health evaluation project: (1) policies and practices data related to prevention of perinatal transmission of hepatitis B, HIV, and rubella; (2) maternal and neonate hospitalization data from medical records; and (3) National Quality Forum (NQF) indicator data. Policy and practices data and medical record data were collected from the 119 participating hospitals. NQF data were collected from a subset of these 119 hospitals (n=50). Hospital selection criteria and medical record selection criteria are described in [Sections 5.1](#) and [5.2](#), respectively.

### 5.1 Hospital Selection

#### 5.1.1 Selection Criteria for the Policies and Practices Survey and the Medical Record Review

A total of 119 hospitals were selected to participate in this survey. Selection criteria included hospitals: (1) located in each of the eight DSHS regions; (2) with more than 100 live births or 30 cesarean births;<sup>24</sup> (3) located in areas of the state with a high incidence of hepatitis B; and (4) identified by DSHS regional perinatal nurse coordinators.

#### 5.1.2 Selection Criteria for the National Quality Forum (NQF) Survey

All 119 hospitals that participated in the policies and practices survey and the medical record review were eligible to participate in a follow-up survey to assess hospital practices with regard to an endorsed NQF metric (See Section 7: Appendix: Survey Tool). Of the 119 eligible hospitals, 50 (42.0%) participated in the NQF assessment.

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<sup>23</sup> Headley VL, Litaker JR, Chou, JY, Ramón M, Hasty K. Assessing Hospital Policies and Practices of Hepatitis B, HIV, Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008. June 2010.

<sup>24</sup> A significant number of births are from those hospitals identified in the DSHS Annual Hospital Survey with greater than 100 deliveries per year (2008) and the Texas Healthcare Information Collection with greater than 30 cesarean births per year (2007).



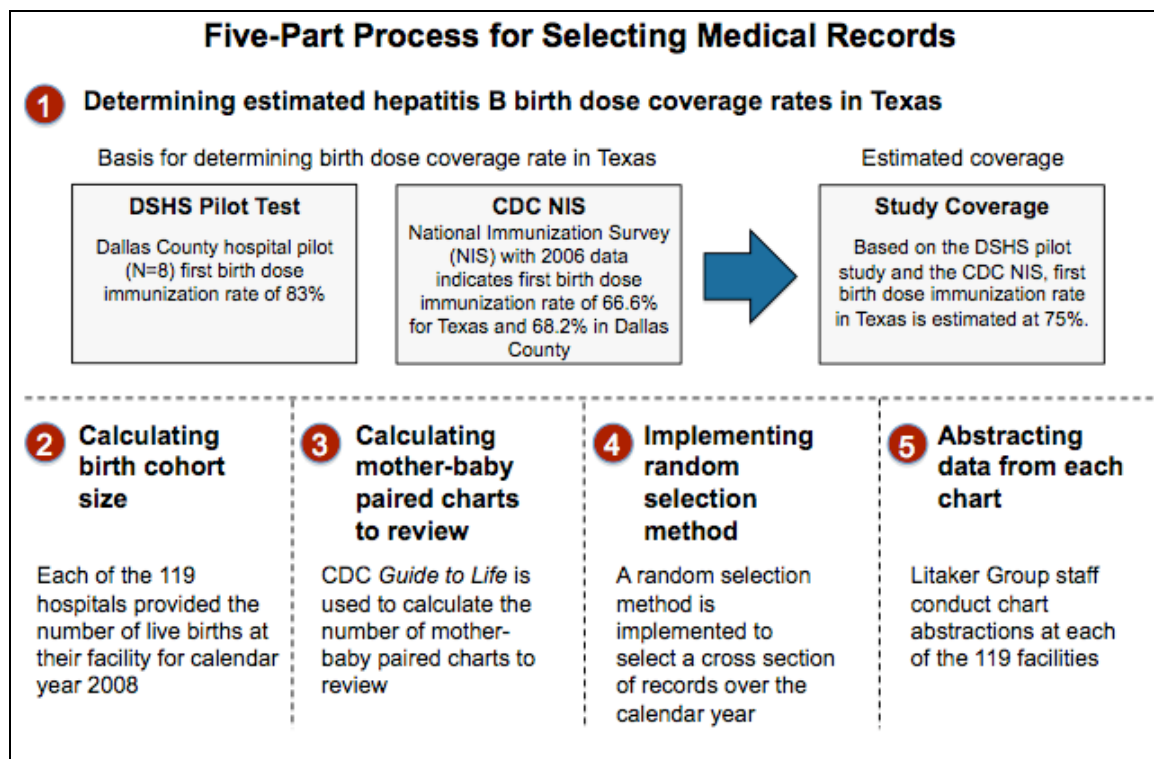
## 5.2 Medical Record Selection

Medical record selection was a five-part process (See Figure 5.1). It included:

1. Determining the estimated hepatitis B birth dose coverage rate in Texas;
2. Determining the birth cohort size at each hospital;
3. Calculating the number of mother-baby paired charts to review based on (1) and (2);
4. Implementing a random selection method to identify which specific medical records to review; and
5. Abstracting data from each chart.

Each step is described below.

**Figure 5.1:** The five-part process for selecting medical records for data abstraction



#### 5.2.1.1 Determining the Estimated Hepatitis B Birth Dose Coverage Rate in Texas

For the purposes of this study, the expected hepatitis B birth dose coverage rate is estimated at 75% based on findings from the CDC National Immunization Survey (2006 data) and from a DSHS pilot study of eight hospitals in Dallas County in 2008. The National Immunization Survey reported statewide hepatitis B birth dose coverage of 66.6% and coverage in Dallas County of 68.2%. The DSHS pilot study in Dallas County reported birth dose immunization of hepatitis B at 83%.

#### 5.2.1.2 Calculating Birth Cohort Size

Participating hospitals reported the number of live births in calendar year 2008 as part of the response to the policies and practices survey.

#### 5.2.1.3 Calculating Mother-Baby Paired Charts to Review

Calculating the number of mother-baby paired charts to review at each hospital was based on two variables: (1) the expected hepatitis B vaccine birth dose coverage rate; and (2) the number of 2008 live births at a particular hospital. Data for these two variables are discussed in [Sections 5.2.1.1](#) and [5.2.1.2](#), respectively.

Data for these two variables were applied to Table 5.1 to determine the number of mother-baby chart pairs to review. As an example, if a hospital reported between 1,500 and 2,000 live births and the expected birth dose coverage rate is 75%, 107 mother-baby paired medical records were reviewed to meet methodological standards established by the CDC. In instances where the actual reported number of live births fell between two birth cohort sizes in Table 5.1 rounding to the closest birth cohort size occurred to determine the number of charts to review.

**Table 5.1:** The CDC methodology used to calculate mother-baby pair sample sizes for medical record review based on hospital birth cohort size and expected maternal screening or birth-dose coverage

| Expected Maternal HBsAg Screening or Hepatitis B Vaccine Birth-Dose Coverage* |           |           |           |           |            |     |     |     |     |     |
|---|-----------|-----------|-----------|-----------|------------|-----|-----|-----|-----|-----|
| Birth Cohort Size   | 95%       | 90%       | 85%       | 80%       | 75%        | 70% | 65% | 60% | 55% | 50% |
| 100   | 22        | 35        | 43        | 49        | 53         | 56  | 58  | 59  | 60  | 60  |
| 200   | 25        | 43        | 55        | 65        | 72         | 77  | 81  | 84  | 85  | 86  |
| 300   | 26        | 46        | 61        | 73        | 82         | 89  | 94  | 97  | 99  | 100 |
| 450   | 27        | 48        | 65        | 79        | 90         | 98  | 105 | 109 | 112 | 113 |
| 600   | 27        | 50        | 68        | 83        | 95         | 104 | 111 | 116 | 119 | 120 |
| 800   | 28        | 51        | 70        | 86        | 99         | 109 | 117 | 122 | 125 | 126 |
| 1,000   | 28        | 51        | 71        | 88        | 101        | 112 | 120 | 126 | 129 | 130 |
| 1,500   | 28        | 52        | 73        | 90        | 105        | 116 | 125 | 131 | 135 | 136 |
| <b>2,000</b>  | <b>28</b> | <b>53</b> | <b>74</b> | <b>92</b> | <b>107</b> | 119 | 128 | 134 | 138 | 140 |
| 3,000   | 28        | 53        | 75        | 93        | 108        | 121 | 131 | 137 | 142 | 143 |
| 5,000   | 28        | 53        | 75        | 94        | 110        | 123 | 133 | 140 | 144 | 146 |
| 10,000  | 28        | 54        | 76        | 95        | 111        | 124 | 135 | 142 | 146 | 148 |
| 20,000  | 28        | 54        | 76        | 96        | 112        | 125 | 136 | 143 | 147 | 149 |
| 40,000  | 28        | 54        | 76        | 96        | 112        | 126 | 136 | 144 | 148 | 150 |
| 50,000  | 28        | 54        | 76        | 96        | 112        | 126 | 136 | 144 | 148 | 150 |
| 70,000  | 29        | 54        | 76        | 96        | 112        | 126 | 136 | 144 | 148 | 150 |
| 80,000  | 29        | 54        | 76        | 96        | 112        | 126 | 136 | 144 | 148 | 150 |
| 100,000   | 29        | 54        | 76        | 96        | 112        | 126 | 136 | 144 | 148 | 150 |
| 150,000   | 29        | 54        | 76        | 96        | 112        | 126 | 136 | 144 | 148 | 150 |
| 300,000   | 29        | 54        | 77        | 96        | 113        | 126 | 136 | 144 | 148 | 150 |
| * Using confidence interval of +/- 8%   |           |           |           |           |            |     |     |     |     |     |

Source: CDC Guide to Life, Managing a Perinatal Hepatitis B Prevention Program-Chapter 2: Establishing Program Goals and Evaluating Your program, Page 9; HBsAg: Hepatitis B surface antigen.

#### 5.2.1.4 Implementing an Interval Selection Method

An interval sampling method was used to identify and request specific medical records from each hospital. This method was on the CDC protocol and allowed records to represent the entire calendar year. Hospitals were instructed to retrieve records in a specific sequence to ensure record representation of the entire 2008 population. The medical record or health information department at each hospital was responsible for collecting these records based on instructions provided by The Litaker Group. The interval sampling method for each hospital was calculated as follows.

$$\text{(Number of Live Births in 2008) / (Number of Records to Review) = Sampling Interval for Medical Record Pull}$$

For example, if a hospital had 2,000 live births and 100 records were requested for review, the interval sampling method would be 20. This means that starting with the first birth record in January 2008, the hospital would pull each twentieth record thereafter until 100 records were pulled. To mitigate incomplete or unavailable medical records, each hospital was to pull an additional three records beyond the sample number determined by CDC protocol. If fewer than the required number of records was retrieved by the end of December 2008, hospitals were requested to pull the necessary number of records to complete the total number requested. The total number of mother-baby paired medical records reviewed at each hospital ranged from a low of 96 to a high of 116, with an average of 106 record pairs reviewed at each hospital. A total of 12,670 maternal records and 13,036 baby records were reviewed. Neonate records outnumbered maternal records because of some multiple birth events, in which case hospitals were asked to retrieve records for all live births associated with the birth event.

### 5.3 Data Collection Tools

Three data collection tools were created for this public health evaluation project. Each is described separately below.

1. Perinatal Hepatitis B Hospital Policies and Practices Survey
2. Perinatal Hepatitis B Chart Audit Data Collection Tool
3. National Quality Forum Measure Assessment Tool

#### 5.3.1 Policies and Practices Data Collection Tool

##### 5.3.1.1 Background

The Perinatal Hepatitis B Hospital Policies and Practices Survey was developed to obtain specific information from each participating hospital related to hospital demographics, written policies, preprinted orders, and other questions as applicable to hepatitis B, HIV, and rubella.<sup>25</sup>

##### 5.3.1.2 Data Collection

The hospital administrator or other designee was identified as the initial contact person to receive this survey. The name and address of each hospital administrator was verified by calling each of the 119 facilities. The survey was administered to each hospital between April and May 2009, except for one facility that completed the survey in November 2009. Data collected for this survey were for calendar year 2008. Hospitals could submit their responses by mail, fax, or online.

##### 5.3.1.3 How Data Were Used

Data from the policies and practices surveys were used to identify associations between specific hospital activities (e.g., prenatal screening for maternal hepatitis B surface antigen (HBsAg), birth dose administration of hepatitis B vaccine to a newborn, administration of hepatitis B immunoglobulin (HBIG) when indicated, and practices and policies in place to guide these activities). The number of live births in the 2008 metric was used to determine the number of medical records to review for each hospital (See Section 5.2).

#### 5.3.2 Chart Audit Data Collection Tool

##### 5.3.2.1 Background

The Perinatal Hepatitis B Chart Audit Data Collection Tool was used to collect data at each hospital. Site visits were conducted from April 2009 to February 2010. No personally identifiable data elements were collected, obtained, or recorded by The Litaker Group. This tool was created based on input from DSHS program staff, a previous data collection instrument, and potential analyses to be conducted. Data were entered into a

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<sup>25</sup> Headley VL, Litaker JR, Chou, JY, Ramón M, Hasty K. Assessing Hospital Policies and Practices of Hepatitis B, HIV, Rubella, and Syphilis Screening and Vaccination among Texas Newborns in 2008. June 2010.



Microsoft Access database designed specifically for this tool. Key features of this database included internal validation to prevent errors from occurring.

#### 5.3.2.2 Data Collection

Data collection was completed by one of eight Litaker Group staff members on site at each hospital for four to five days, except for one hospital that allowed for remote access to electronic health records. Table 5.2 outlines activities associated with data abstraction at each hospital.

**Table 5.2:** Summary of data abstraction activities at each hospital

| Activity  | Action   |
|---|--|
| 1. Litaker Group (LG) advises hospital of records to make available                 | <ul style="list-style-type: none"> <li>• LG staff advised hospitals in advance of site visit to pull specified number of records using internal sampling method</li> </ul>   |
| 2. LG schedules appointments  | <ul style="list-style-type: none"> <li>• LG staff scheduled appointments at each facility to begin on a Monday morning at 9:00am, unless otherwise requested by the hospital.</li> </ul>   |
| 3. LG conducts kick-off meeting   | <ul style="list-style-type: none"> <li>• Along with a representative of the local health department, a LG staff member conducted a kick-off meeting to discuss the project, the process for data collection, and project outcomes, unless the hospital requested not to have a kick-off meeting or if the health department representative was not available.</li> </ul>   |
| 4. Hospital staff introduces medical record system                                  | <ul style="list-style-type: none"> <li>• Hospital staff members instructed LG staff on how to review and abstract data from either paper or electronic records.</li> </ul>   |
| 5. Hospital staff provides listing of pulled records                                | <ul style="list-style-type: none"> <li>• Hospital staff provided LG staff member a paper list of all pulled records.</li> <li>• LG staff made notes on this document and left it with the project contact when data collection was complete.</li> <li>• Any medical record with a positive screen for hepatitis B surface antigen, HIV, or syphilis was noted by an asterisk on this list for follow-up (See Activity 8; Table 5.2) by the local health department.</li> <li>• Project contact was asked to keep this list on file.</li> </ul> |
| 6. LG staff conducts data review and abstraction                                    | <ul style="list-style-type: none"> <li>• LG staff reviewed thoroughly each medical record based on protocol and abstracted data into the MS Access database.</li> </ul>  |
| 7. LG staff aggregates into master file   | <ul style="list-style-type: none"> <li>• LG project manager aggregated data into a master file on an ongoing basis.</li> </ul>   |
| 8. Local health department staff follows up with hospitals post-visit <sup>26</sup> | <ul style="list-style-type: none"> <li>• LG staff contacted local health department to follow up on cases of positive screens for hepatitis B surface antigen, HIV, or syphilis.</li> </ul>  |

<sup>26</sup> Litaker Group protocol stated that LG staff would collect no identifiable personal health information on any patient or medical record reviewed. In order to notify local health departments of positive screens for hepatitis B surface antigen, HIV and syphilis, LG staff would note any positive cases on the list of records provided by each hospital with a generic symbol, such as an asterisk, that would not be defined on the list nor indicate to an uninformed observer of the list the nature of the notation. This list would then be returned to the hospital at the end of the medical review. LG staff would make a note that a particular hospital had a "positive" case for follow-up. The LG would contact the local health department and note a "positive" case and provide the contact name and number of the hospital representative to conduct follow-up.



#### 5.3.2.3 How Data Were Used

Data from the medical chart abstraction were used in conjunction with data from the policies and practices survey to conduct statistical analyses.

### 5.3.3 National Quality Forum Measure Assessment Tool

#### 5.3.3.1 Background

The National Quality Forum has endorsed a quality metric to assess hepatitis B birth dose immunization at the hospital level. The Centers for Disease Control and Prevention is the intellectual property owner of this metric. As part of the hepatitis B public health evaluation project, The Litaker Group also collected data to assist the CDC and NQF with evaluating this metric. A NQF assessment tool was created and used to collect feasibility data. Section 5.1.2 outlines the selection criteria for hospitals to participate in this assessment.

#### 5.3.3.2 Data Collection

The hospital contact person identified through the Policies and Practices Survey or through data collection activities was the designated contact person to complete the NQF survey. The survey was administered to each hospital between April and May 2010. Data collected for this survey were for calendar year 2008. If measurements could not be made for this time period, hospitals were asked to identify and provide data for an alternate time period. Guardian refusal rate was also requested, as this piece of data is allowed as an exclusion criterion by the NQF metric in establishing the rate of birth dose coverage.

#### 5.3.3.3 How Data Were Used

Data from the NQF measure assessment tool were used to identify the types of data related to birth dose coverage for hepatitis B that could be collected by a hospital and the feasibility of collecting this data. Information was also compared to data collected in the policies and practices survey and the medical record review.





## 5.4 Data Analyses

Two types of data were used in analyses for this project: (1) raw data counts and (2) weighted data counts. Data collected from the hospital policies and practice surveys were analyzed based on the raw count with the hospital as the unit of analysis. Data collected from the medical record review were analyzed using weighted maternal and neonatal data. The number of medical records obtained at each hospital varied based on the birth cohort size of that particular hospital (See Section 5.2: Medical Record Selection) and ranged from 96 – 116 chart pairs per hospital. Applying a statistical weight to maternal and neonatal data based on the chart sample variation allowed for comparison between hospital and data aggregation. All analyses were conducted using Microsoft® Office Excel® 2007 with confidence intervals calculated using OpenEpi, Version 2.

## **6 Appendix: NQF Survey Cover Letter**

See attached PDF.



## 7 Appendix: Survey Tool

### Background Information

1. Please provide the following details for the primary contact person and your hospital

Name of primary contact for completion of this survey

---

Title / position of primary contact

---

Phone number of primary contact

---

Fax number of primary contact

---

Email address of primary contact

---

Name of Hospital

---

Address of Hospital

---

City of Hospital

---

Zip-Code of Hospital

---

County Hospital Located In

---

2. Do you have the capability to assess the number of neonates who receive hepatitis B vaccine prior to discharge?

☐ Yes (Please continue to question 3)

☐ No (go to question 4)



3. How many neonates born in your facility in calendar year 2008 received hepatitis B vaccine prior discharge?

☐ Enter number here \_\_\_\_\_

☐ Unable to determine the number (go to question 3a)

Select the source of this data (check all that apply):

☐ Medication Administration Record

☐ Claims Data

☐ Pharmacy Record

☐ Vaccine Consent Statement

☐ Clinical Database

☐ Nurses Notes

☐ Other Data or Record Source (please describe)

---

Select method of retrieving this information (check all that apply and go to question 5)

☐ Digital EMR (HIMS)

☐ PDF / Scanned EMR

☐ Paper-Based Records

- 3a. How many neonates born in your facility, for any 12-month period, received hepatitis B vaccine prior discharge? (If you answered Question 3 proceed to Question 5)

☐ Enter number vaccinated here \_\_\_\_\_

☐ Unable to determine the number (go to question 3b)

Define the 12-month period here \_\_\_\_\_

Define the number of live births during this time period \_\_\_\_\_

Select the source of this data (check all that apply):

☐ Medication Administration Record

☐ Claims Data

☐ Pharmacy Record

☐ Vaccine Consent Statement

☐ Clinical Database

☐ Nurses Notes

☐ Other Data or Record Source (please describe)

---

Select method of retrieving this information (check all that apply and go to question 4)

☐ Digital EMR (HIMS)

☐ PDF / Scanned EMR

☐ Paper-Based Records



3b. How many neonates were born in your facility, for any other specified period of time, received hepatitis B vaccine prior to discharge? (If you answered Question 3 or 3a proceed to Question 4 or 5 as directed in that question)

☐ Enter number vaccinated  
here \_\_\_\_\_

☐ Unable to determine the number  
(go to question 4)

Define the time period here \_\_\_\_\_

Define the number of live births during this  
time period \_\_\_\_\_

Select the source of this data (check all that apply):

☐ Medication Administration  
Record

☐ Claims Data

☐ Pharmacy Record

☐ Vaccine Consent Statement

☐ Clinical Database

☐ Nurses Notes

☐ Other Data or Record Source (please describe)

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Select method of retrieving this information (check all that apply and go to question 4)

☐ Digital EMR (HIMS)

☐ PDF / Scanned EMR

☐ Paper-Based Records



4. If you are unable to provide information on the number of neonates vaccinated before discharge from your facility, why not (please answer for each time frame in which you are not able to provide this information)?

|  | <b>Time<br/>burden<br/>for<br/>reviewing<br/>records<br/>is too<br/>great</b> | <b>Immunization<br/>data not part<br/>of accessible<br/>medical<br/>record</b> | <b>Records<br/>off site</b> | <b>Cannot query<br/>for<br/>immunization<br/>data</b> | <b>Other (please<br/>describe below)</b> |
|--|---|--|-----------------------------|---|--|
| For the CY<br>2008                         | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>                              | <hr/>                                    |
| For an<br>alternate<br>12-month<br>period  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>                              | <hr/>                                    |
| For a<br>period<br>other than<br>12 months | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>    | <input type="checkbox"/>                              | <hr/>                                    |

5. What other data sources did you consider to determine the number of neonates who received the hepatitis B vaccine prior to discharge?

☐ **None**

☐ **Other (indicate data sources):** \_\_\_\_\_

☐ Unable to determine vaccination number for any defined time period

6. How many hours did it take to determine the number of neonates who received the hepatitis B vaccine prior to discharge, once you decided on the source of data and method?

☐ Number of hours \_\_\_\_\_

☐ Unable to determine vaccination number for any defined time period

7. Do you have the capability to assess the number of neonates who do not receive vaccination prior to hospital discharge due to parent or guardian refusal?

☐ Yes (Please continue to question 8)

☐ No (go to question 9)



8. How many neonates born in your facility, in calendar year 2008, did not receive the hepatitis B vaccine prior discharge due to parent or guardian refusal?

☐ Enter number refused here \_\_\_\_\_ ☐ Unable to determine the number refused for this time period (go to question 8a)

Select the source of this data (check all that apply):

- ☐ Medication Administration Record ☐ Claims Data ☐ Pharmacy Record  
☐ Vaccine Consent Statement ☐ Clinical Database ☐ Nurses Notes  
☐ Other Data or Record Source (please describe)

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Select method of retrieving this information (check all that apply and go to question 10)

- ☐ Digital EMR (HIMS) ☐ PDF / Scanned EMR ☐ Paper-Based Records

- 8a. How many neonates born in your facility, for any 12-month period, did not receive the hepatitis B vaccine prior discharge due to parent or guardian refusal? (If you answered Question 8 proceed to Question 10)

☐ Enter number refused here \_\_\_\_\_ ☐ Unable to determine the number refused for this time period (go to question 8b)

Define the 12-month period here \_\_\_\_\_

Define the number of births during this time period \_\_\_\_\_

Select the source of this data (check all that apply):

- ☐ Medication Administration Record ☐ Claims Data ☐ Pharmacy Record  
☐ Vaccine Consent Statement ☐ Clinical Database ☐ Nurses Notes  
☐ Other Data or Record Source (please describe)

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Select method of retrieving this information (check all that apply and go to question 9)

- ☐ Digital EMR (HIMS) ☐ PDF / Scanned EMR ☐ Paper-Based Records

- 8b. How many neonates born in your facility for any other specified period of time did not receive the hepatitis B vaccine prior discharge due to parent or guardian refusal? (If you answered Question 8 or





8a proceed to Question 9 or 10 as directed in that question)

☐ Enter number refused here \_\_\_\_\_ ☐ Unable to determine the number refused for any time period (go to question 9)

Define the time period here \_\_\_\_\_

Define the number of births during this time period \_\_\_\_\_

Select the source of this data (check all that apply and go to question 4):

- ☐ Medication Administration Record    ☐ Claims Data    ☐ Pharmacy Record
- ☐ Vaccine Consent Statement    ☐ Clinical Database    ☐ Nurses Notes
- ☐ Other Data or Record Source (please describe) \_\_\_\_\_

Select method of retrieving this information (check all that apply and go to question 9)

- ☐ Digital EMR (HIMS)    ☐ PDF / Scanned EMR    ☐ Paper-Based Records

9. If you are unable to provide information on the number of neonates who are not vaccinated before discharge from your facility due to parent or guardian refusal, why not (please answer for each time frame in which you are not able to provide this information)?

|                       | <b>Records are not accessible</b> | <b>Do not track consent refusals in paper record</b> | <b>Do not track consent refusals in EMR</b> | <b>No standardized data field in the EMR</b> | <b>Other (please describe below)</b> |
|-----------------------|-----------------------------------|--|---|--|--------------------------------------|
| For the CY 2008       | <input type="checkbox"/>          | <input type="checkbox"/>                             | <input type="checkbox"/>                    | <input type="checkbox"/>                     | _____                                |
| For a 12-month period | <input type="checkbox"/>          | <input type="checkbox"/>                             | <input type="checkbox"/>                    | <input type="checkbox"/>                     | _____                                |
| For another period    | <input type="checkbox"/>          | <input type="checkbox"/>                             | <input type="checkbox"/>                    | <input type="checkbox"/>                     | _____                                |

10. Can you provide an estimated cost, either direct (actual cost of record retrieval, if any) and/or indirect (cost for resource hours used to retrieve records) associated with determining the number of neonates who received the hepatitis B vaccine prior to discharge?

Direct Cost    Indirect Cost    Unable to Determine



|   |    |    |                          |
|---|----|----|--------------------------|
| <input type="checkbox"/> Vaccination with hepatitis B prior to discharge  | \$ | \$ | <input type="checkbox"/> |
| <input type="checkbox"/> No vaccination due to parent or guardian refusal | \$ | \$ | <input type="checkbox"/> |

11. Are there any anticipated or planned changes in the next 3 years regarding health information management at your facility that would allow you to provide or make it easier to provide the following information?

The number of neonates born at your facility who receive the hepatitis B vaccine before discharge ☐ Yes ☐ No

The number of consent refusals by parents or guardians who do not allow their newborn to vaccinated for hepatitis B ☐ Yes ☐ No

If either above checked "Yes", please briefly describe anticipated change(s):

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## 8 Appendix: DSHS Health Service Regions Map

**Figure 8.1:** Map of Texas Department of State Health services health service region boundaries

