

2014 Survey of Oregon Birthing Hospitals Regarding the Perinatal Hepatitis B Prevention Program (PHBPP)

Background

Preventing perinatal transmission is a critical feature of hepatitis B case follow-up. Children who are exposed to the hepatitis B virus (HBV) perinatally or in the first year of life have up to a 90% chance of developing chronic HBV infection. Up to 25% of those chronic carriers will die as a result of liver disease prematurely.^{1, 2} These children are also capable of infecting others throughout their life. These risks have made it important to ensure infants born to women with HBV receive the appropriate treatment to protect them from HBV.

Due to this burden placed on infants and children, the Centers for Disease Control and Prevention (CDC) initiated the Perinatal Hepatitis B Prevention Program (PHBPP) in 1990, aimed at reducing vertical transmission from mothers to their infants. An analysis of the program in 2014, found it to be a cost-effective use of resources in increasing quality-adjusted life-years (QALYs), being associated with 2,351 fewer total infections (1,485 perinatal and 866 childhood).³

An important player in ensuring infants receive the appropriate treatment to protect them against HBV is the birth facility. The CDC recommends that delivery hospitals implement standing orders and protocols to identify all infants born to hepatitis B surface antigen (HBsAg) positive mothers, to administer the appropriate immunoprophylaxis, and to administer the hepatitis B vaccine birth dose to all newborns prior to hospital discharge.^{2, 4}

In order to better understand the current policies and procedures at Oregon birth hospitals, a survey was distributed to all contacts identified at the 50 birth hospitals in the state for the PHBPP.

Methods

The survey was developed using SurveyMonkey and asked birth hospital perinatal hepatitis B contacts questions regarding policies and procedures, relationships with partners, factors contributing to successfully, or proving to be a barrier to, carrying out various perinatal hepatitis B activities, and resources that would be helpful to their work. The survey link was emailed to contacts with an original response window of two weeks. A reminder email was also sent. Due to a low response rate, a second round of targeted emails was sent to birth hospital contacts for facilities with no response. In order to encourage more responses, none of the survey questions were required to be completed; therefore that response rates vary between questions due to incomplete surveys or skipped questions. Results were examined for all respondents and by urban vs. rural/frontier census tract (referred to as 'rural' throughout the report).

Findings

Descriptives

In total, 39 responses were received. Four responses were removed from the analysis due to repeat responses by individuals. Thirty-five responses were included in the analysis, representing 34 hospitals. Two responses were received from different individuals at the same hospital. This represents a response rate of 68% of all birth hospitals having completed the survey. The 34 hospitals completing the survey delivered 75% of all hospitals births in Oregon during 2014. Both the HBsAg screening rate and birth dose administration rate, as reported to the Electronic Birth Registration System (EBRS), were comparable for the hospitals represented by the respondents than the state average for birth hospitals (97.7% vs 97.4% and 73.2% vs 72.2%, respectively).

The proportion of responding birth hospitals was well representative of all birth hospitals in Oregon with regards to urban/rural/frontier divide, Portland metropolitan area representation, proportion of critical access hospitals, and size of hospital (Table 1).

Table 1. Descriptive characteristics of respondent birth hospitals as compared to all birth hospitals in Oregon			
	All birth hospitals	Respondents	Respondents as % of all
N	50	34*	68%
# Counties represented	29	22	76
Births at facilities†	44,223	33,362	75
Hospital Location	N (%)	N (%)	
Urban	20 (40)	15 (44)	75
Rural	23 (46)	16 (47)	70
Frontier	7 (14)	3 (9)	43
Metro hospital	13 (26)	8 (24)	62
Critical access hospital	18 (36)	13 (38)	72
Number of Beds			
<50	25 (50)	15 (44)	60
50-99	5 (10)	5 (15)	100
100-199	10 (20)	7 (21)	70
>200	10 (20)	7 (21)	70
* Received a total of 35 responses representing 34 hospitals			
† Data represent births delivered in 2014			

Policies and Procedures

Respondents were asked to report on existing policies and procedures at their hospital related to perinatal hepatitis B. These policies and procedures are summarized below in Table 2 (page 3). When reporting on the documents at their facility available to support each activity, contacts could choose all that applied. In addition, if respondents reported routinely administering hepatitis B immune globulin (HBIG) or the hepatitis B vaccine birth dose, they were asked to identify the time frame in which the activity was typically completed. Results are reported in the following section based on the recommendation for each population. Recommendations are provided in italics.

RECOMMENDATIONS FOR ALL BIRTHS: *Review the HBsAg status of all pregnant women at admission. In addition, perform HBsAg testing as soon as possible on women who do not have documented HBsAg test results, were at risk for HBV infection during pregnancy, or had clinical hepatitis since previous testing.*

All respondents reported routinely reviewing HBsAg status of pregnant woman at the time of admission for delivery. It was most common for hospitals to have a written policy (n=22; 62%) or standing order (n=11; 31%) in place to support this activity.

Nearly all urban hospitals (94%) reported routinely ordering tests for women delivering with an unknown HBsAg status, while 84% of rural hospitals reported routinely completing this task. A written policy was the most commonly used document for urban hospitals (60%), while rural hospitals depended more on an individual physician order (56%).

Table 2. Perinatal hepatitis B-related activities for hospitals, percent completing and having supporting documents, by urban or rural location.																
	Review HBsAg at time of admission		Order test for women with unknown HBsAg status		Administer HBIG											
	Urban	Rural	Urban	Rural	HBsAg+ mom		HBsAg unknown mom									
	N %	N %	N %	N %	Urban	Rural	Urban	Rural								
Hospital reported routinely completing activity																
Yes	16	100%	19	100%	15	94%	16	84%	16	100%	18	95%	12	75%	10	53%
Type of document to support																
Written policy	11	69%	11	58%	9	60%	8	50%	8	50%	9	50%	5	42%	6	60%
Standing order	6	38%	5	26%	5	33%	3	19%	9	56%	9	50%	7	58%	7	70%
Individual physician order	0	0%	1	5%	5	33%	9	56%	3	19%	4	22%	5	42%	5	50%
Other	2	13%	3	16%	0	0%	0	0%	1	6%	0	0%	0	0%	0	0%
Don't know	1	6%	0	0%	1	7%	2	13%	1	6%	1	6%	1	8%	1	10%
N/A	1	6%	1	5%	0	0%	0	0%	0	0%	0	0%	2	17%	1	10%

Table 2 Continued: Perinatal hepatitis B-related activities for hospitals, percent completing and having supporting documents, by urban or rural location								
	Administer birth dose							
	HBsAg + mom		HBsAg unknown mom		HBsAg- mom			
	Urban	Rural	Urban	Rural	Urban	Rural		
	N %	N %	N %	N %	N %	N %		
Hospital reported routinely completing activity								
Yes	15	94%	18	95%	15	94%	17	89%
Type of document to support								
Written policy	6	40%	8	44%	6	40%	8	47%
Standing order	9	60%	10	56%	10	67%	10	65%
Individual physician order	3	20%	4	22%	3	20%	4	29%
Other	0	0%	0	0%	0	0%	0	0%
Don't know	1	7%	0	0%	1	7%	0	0%
N/A	0	0%	0	0%	0	0%	0	0%

RECOMMENDATIONS FOR BIRTHS TO HBsAg-POSITIVE MOTHERS: *Administer HBIG and the hepatitis B vaccine birth dose to all infants born to HBsAg-positive mothers within 12 hours after birth.*

One hundred percent of urban and 95% of rural respondents reported administering HBIG to infants born to HBsAg-positive mothers, with a written policy (50% for urban and rural) or standing order (56% urban, 50% rural) being the most common document to support the practice. For those who had documentation to support HBIG administration, urban hospitals were more likely to report administering HBIG within the recommended timeframe (12 hours after birth) than rural hospital (94% vs. 83%; Table 3).

Table 3. Respondents meeting 12-hour HBIG administration recommendations for infants of HBsAg-positive mothers				
	Activity is routine/ has documents to support	Administers within recommended time frame		
	n (% of all)	n	% of routine	% of all
Urban	16 (100)	15	94	94
Rural	18 (95)	15	83	79

Ninety-four percent of urban hospital respondents and 95% of rural hospital respondents reported routinely administering the hepatitis B vaccine birth vaccine to infants of HBsAg-positive women. A standing order was the most commonly reported document to support the practice (N=19, 54%). Urban respondents were more likely to report administering the birth dose within 12 hours of birth, as recommended, than were rural respondents (93% vs. 67%; Table 4).

Table 4. Respondents meeting 12-hour birth dose administration recommendation for infants of HBsAg-positive mothers				
	Activity is routine/ has documents to support	Administers within recommended time frame		
	n (% of all)	n	% of routine	% of all
Urban	15 (94)	14	93	88
Rural	18 (95)	12	67	63

RECOMMENDATIONS FOR BIRTHS TO HBsAg-UNKNOWN MOTHERS: *Administer the hepatitis B vaccine birth dose to all infants born to HBsAg-unknown mothers within 12 hours after birth. In addition, infants born to HBsAg-unknown women should receive HBIG within 7 days if the woman is found to be HBsAg-positive, or if the infant is of low birth weight [$<2,000g$] and the mother remains HBsAg-unknown 12 hours after birth.*

Seventy-five percent of urban and 53% of rural hospitals reported administering HBIG to infants of HBsAg-unknown women, with a standing order (58% urban, 70% rural) being reported as the most common document to support the practice. Of the respondents reporting routinely administering HBIG to infants of women with an unknown HBsAg status, rural respondents were more likely to report administering HBIG within 12 hours of birth, than were urban respondents (80% vs. 67%; Table 5).

Table 5. Respondents meeting HBIG administration recommendations for infants of HBsAg-unknown mothers							
	Activity is routine/ has documents to support	Administers within the 12- hour recommendation			Administers within the 7- day recommendation		
	n (% of all)	n	% of routine	% of all	n	% of routine	% of all
Urban	12 (75)	8	67	50	11	92	69
Rural	10 (53)	8	80	42	9	90	47

Ninety-four percent of urban hospital respondents and 95% of rural hospital respondents reported routinely administering the hepatitis B vaccine birth dose to infants of HBsAg-unknown women. A standing order was the most commonly reported document to support the practice (n=20, 57%). Rural respondents were less likely than urban respondents to report administering the hepatitis B vaccine birth dose to infants of HBsAg-unknown within 12 hours of birth (61% vs 87%; Table 6).

Table 6. Respondents meeting 12-hour birth dose administration recommendation for infants of HBsAg-unknown mothers				
	Activity is routine/ has documents to support	Administers within recommended time frame		
	n (% of all)	n	% of routine	% of all
Urban	15 (94)	13	87	81
Rural	18 (95)	11	61	58

RECOMMENDATION FOR BIRTHS TO HBsAg-NEGATIVE MOTHERS: *Administer the hepatitis B vaccine birth dose to all infants born to HBsAg-negative mothers prior to hospital discharge.*

Ninety-four percent of urban hospital respondents and 89% of rural hospital respondents reported routinely administering the hepatitis B vaccine birth dose to infants of HBsAg-negative women. A standing order was the most commonly reported document to support the practice (n=21, 60%). All respondents with supporting documentation reported administering the hepatitis B vaccine birth dose to infants of HBsAg-negative mothers prior to hospital discharge (Table 7).

Table 7. Respondents meeting recommendation to administer hepatitis B vaccine birth dose to infants of HBsAg-negative women prior to hospital discharge.				
	Activity is routine/ has documents to support	Administers within recommended time frame		
	n (% of all)	n	% of routine	% of all
Urban	15 (94)	15	100	94
Rural	17 (89)	17	100	89

RECOMMENDATION: *Notify the local or state health department of deliveries to HBsAg-positive women, including the date and time of HBIG and hepatitis B vaccine birth dose administration.*

Respondents were asked to identify all parties at their hospital responsible for completing this task. Responses were comparable between urban and rural respondents. The [infant's or mother's] physician (31%), infection control (29%), or labor and delivery staff (29%) were the most likely to be identified as the responsible party for reporting. Over a quarter of all hospitals' respondents reported that they did not know who was responsible for reporting births to HBsAg-positive women (Table 8).

Table 8. Hospital staff identified as being responsible for reporting birth to an HBsAg-positive mother to the local public health authority (LPHA)			
	Urban N (%)	Rural N (%)	Total N (%)
Infection Control	4 (25)	6 (32)	10 (29)
Labor and Delivery Staff	5 (31)	5 (26)	10 (29)
Medical Record Staff	2 (13)	1 (5)	3 (9)
Nursery Staff	2 (13)	2 (11)	4 (11)
Physician	5 (31)	6 (32)	11 (31)
Other	2 (13)	2 (11)	4 (11)
Birth Clerk	2 (13)	0 (0)	2 (6)
Don't know	4 (25)	5 (26)	9 (26)

Successes and Barriers

In addition to questions about routine practices and supporting documentation, respondents were asked to indicate what factors they felt contributed to their birth hospital's successfully completing the perinatal hepatitis B activities, as well as what factors proved to be barriers. These results can be found in Tables 10 and 11 (pages 9, 11). The factors in these tables were collapsed into categories (workplace structure, staff factors, provider factors, parental factors, other factors) to better capture overarching successes and barriers. These categories are presented in Figures 1 and 2 (pages 10, 12). The original factors from the tables have been color-coded to match the categories in the figures. The other category has been left out of the figures due to consistently low numbers and for simplicity. Urban responses are in the left columns, with rural responses in the right columns of each pair.

In general, respondents from urban birth hospitals reported more successes than those from rural hospitals. Rural respondents were more likely to identify barriers to completing perinatal hepatitis B activities than urban hospitals. As seen in Figure 1, provider and staff factors (being informed, acceptance, and implementation) were the most frequently identified as contributing to urban hospitals' successfully:

- reviewing HBsAg at admission (92% and 90% identified for provider and staff, respectively);
- ordering HBsAg testing for women with an unknown status (92% and 92%); and
- administering HBIG (85% and 87%).

Rural respondents were less likely than urban respondents to report staff and provider factors as contributing to successful completion of these activities.

A smaller proportion of both urban and rural respondents reported successes for notifying LPHAs and EBRS documentation, with workplace structure and staff factors reported the most frequently.

Up to 38% of urban (EBRS documentation) and 38% of rural (reviewing HBsAg) respondents reported no barriers to one or more of the required activities. The greatest number of barriers were identified for administering the birth dose, with parental factors (refusal or lack of information) making up the largest proportion of responses for both urban and rural hospitals (58% and 50%, respectively). Parental factors were also most frequently identified by urban hospitals as a barrier for ordering HBsAg testing for women with an unknown status and administering HBIG (27% and 23% of urban respondents identified, respectively). On the other hand, provider factors were most frequently identified by rural hospitals as a barrier to administering HBIG. Workplace structure was the most frequent barrier to notifying the LPHA

of a delivery to an HBsAg-positive woman for both the urban and rural respondents (10% and 13%, respectively).

Relationships with Partners

Hospital respondents were asked to rank their relationship with four different partner groups [laboratories, local health departments, OB/GYNs, and pediatricians] on a 5 point scale [very poor to excellent] regarding two different categories of interaction [information sharing and communication]. In general, respondents rated their relationship with partners positively (excellent or good). Ninety-three percent of respondents rated laboratories positively for information sharing and 89% for communications. Positive responses for Local Public Health Authorities (LPHAs) were 79% and 73% for information sharing and communications, respectively. Ninety percent of respondents reported good relations with obstetricians for information sharing and 89% for communications. For pediatricians, 89% of respondents rated the relationship as good for information sharing and 85% for communications.

Resources

Respondents were also asked to identify what, if any, educational materials they would find useful for the work they and their colleagues undertake related to perinatal hepatitis B. The most commonly identified resource by both urban and rural hospital respondents was educational materials for parents (56% and 63%, respectively), followed by reference materials on perinatal hepatitis B recommendations (49% urban and 53% rural; Table 9).

Table 9. Resources identified as being useful for perinatal hepatitis B-related work			
	Urban	Rural	Total
	N (%)	N (%)	N (%)
Educational materials for moms/parents	9 (56)	12 (63)	21 (60)
Educational materials for staff	5 (31)	9 (47)	14 (40)
Information on interpreting laboratory results	2 (13)	5 (26)	7 (20)
Guidance for developing admission orders	0 (0)	2 (11)	2 (6)
Reference materials on perinatal hepatitis B recommendations	7 (49)	10 (53)	17 (49)
No resources needed	2 (13)	2 (11)	4 (11)

Conclusions and Next Steps

While most respondents indicated having some sort of document to support the various perinatal hepatitis B-related activities around a delivery, many facilities still relied on an individual physician’s order to complete some tasks, not meeting the gold standard of a standing order. In addition, the proportion of respondents identifying the appropriate time frame for completing some activities was lower than expected, and about a quarter of all respondents did not know who was responsible for reporting to the LPHA. These findings indicate a gap in knowledge regarding recommendations and a need to follow-up with hospitals to clarify. For example, both urban and rural respondents were less likely to report administering HBIG to infants born to HBsAg-unknown women, as compared to other recommendations. This recommendation is particularly confusing, given that it is reliant on both the infant’s birth weight, as well as the ordering of HBsAg testing for the mother and those results. The lower response rate to this question may indicate a need to emphasize this recommendation. A refresher to clarify recommendations could be especially helpful for rural hospitals, which may be less familiar with recommendations because they encounter fewer HBsAg-positive women delivering at their facility.

Results from the survey will be disseminated to the hospitals and LPHAs. Findings from this survey will also be used to inform future educational materials and work aimed at increasing awareness of perinatal hepatitis B, including the risks, recommendations, and appropriate follow-up.

References

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<http://www.immunize.org/catg.d/p2130.pdf>
3. Barbosa C, et al. 2014. Cost-effectiveness analysis of the National Perinatal Hepatitis B Prevention Program. *Pediatrics*, 133(2), 243-253.
4. Immunization Action Coalition. Guidance for Developing Admission Orders in Labor & Delivery and Newborn Units to Prevent Hepatitis B Virus Transmission.
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Table 10. Respondent-reported successes to completing required perinatal hepatitis B-related activities.													
		Reviewing HBsAg status upon admission		Ordering HBsAg testing for women of unknown status		Administering HBIG within 12 hours		Administering hepatitis B vaccine birth dose		Notifying LPHA of birth to HBsAg-positive mom		Recording HBsAg status in EBRs	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Existing written policy at your hospital supporting recommendations	Count %	11 85%	12 75%	9 69%	10 63%	10 77%	10 63%	11 85%	12 75%	5 38%	6 38%	7 54%	7 44%
Streamlined workflows	Count %	7 54%	8 50%	6 46%	5 31%	7 54%	5 31%	7 54%	7 44%	2 15%	2 13%	5 38%	5 31%
Staff responsibilities regarding hepatitis B are well defined	Count %	11 85%	15 94%	10 77%	11 69%	11 85%	14 88%	12 92%	13 81%	6 46%	6 38%	8 62%	4 25%
Staff is informed on recommendations	Count %	11 85%	13 81%	11 85%	8 50%	11 85%	9 56%	11 85%	9 56%	6 46%	4 25%	9 69%	4 25%
Staff acceptance of recommendations	Count %	12 92%	13 81%	12 92%	9 56%	11 85%	9 56%	9 69%	10 63%	5 38%	3 19%	8 62%	4 25%
Staff implementation of recommendations	Count %	12 92%	13 81%	13 100%	10 63%	12 92%	9 56%	10 77%	10 63%	4 31%	2 13%	8 62%	4 25%
Providers are informed on recommendations	Count %	13 100%	13 81%	13 100%	11 69%	12 92%	10 63%	11 85%	10 63%	5 38%	4 25%	4 31%	3 19%
Provider acceptance of recommendations	Count %	11 85%	12 75%	11 85%	11 69%	11 85%	11 69%	9 69%	10 63%	3 23%	4 25%	4 31%	3 19%
Provider implementation of recommendations	Count %	12 92%	11 69%	12 92%	8 50%	10 77%	9 56%	7 54%	8 50%	4 31%	3 19%	4 31%	3 19%
Parental understanding of the importance of the recommendation	Count %	8 62%	10 63%	8 62%	7 44%	8 62%	8 50%	6 46%	8 50%	1 8%	1 6%	4 31%	2 13%
Other factors	Count %	1 8%	0 0%	0 0%	0 0%	1 8%	0 0%	0 0%	0 0%	1 8%	1 6%	0 0%	1 6%

Figure 1. Factors identified as contributing to successful perinatal hepatitis B practices, urban vs. rural

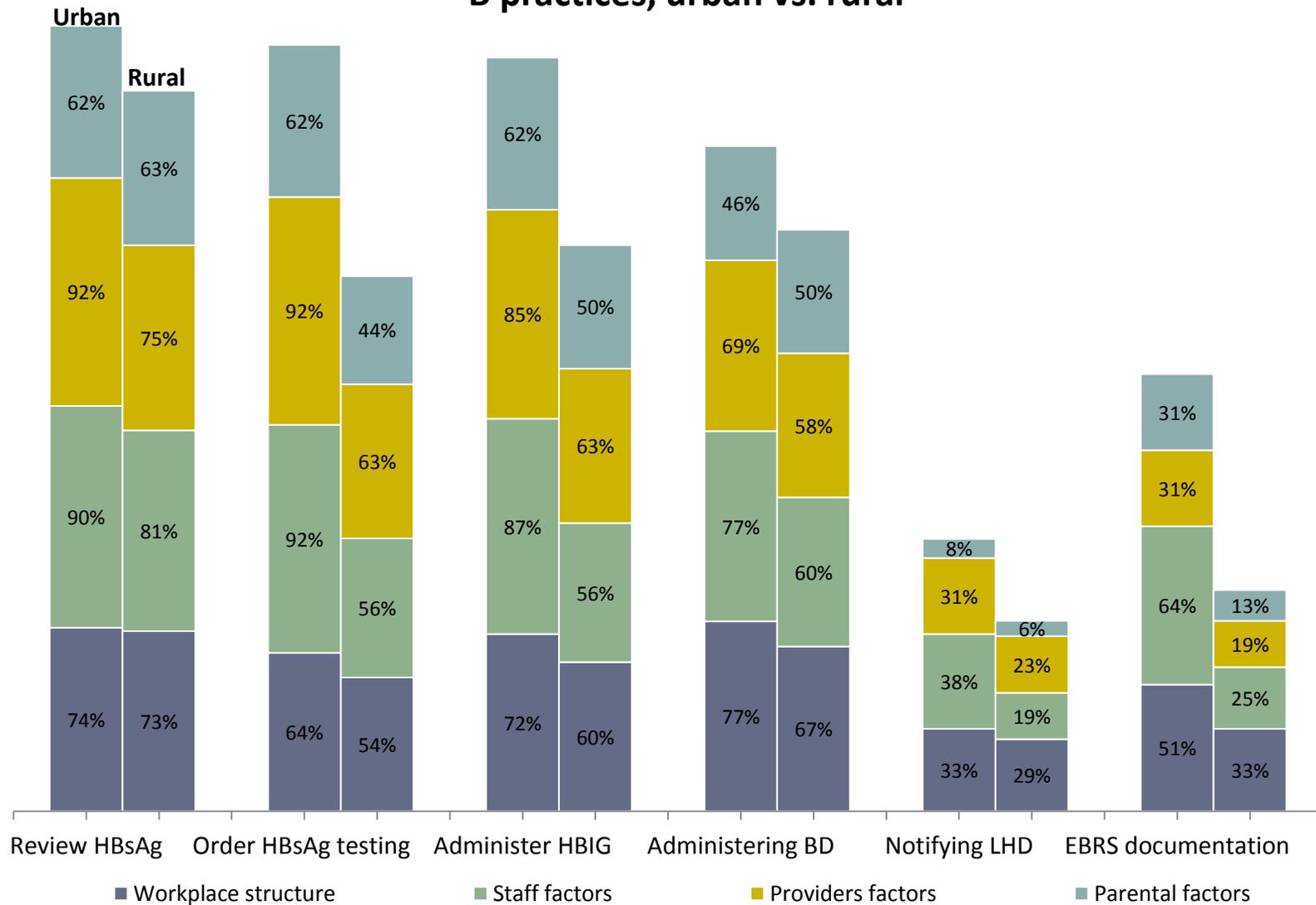


Table 11. Respondent-reported barriers to completing required perinatal hepatitis B-related activities.

		Reviewing HBsAg status upon admission		Ordering HBsAg testing for women of unknown status		Administering HBIG within 12 hours		Administering hepatitis B vaccine birth dose		Notifying LPHA of birth to HBsAg- positive mom		Recording HBsAg status in EBRS	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Lack of written policy at your facility supporting this practice	Count %	0 0%	1 6%	1 8%	2 13%	0 0%	1 6%	0 0%	1 6%	2 15%	2 13%	0 0%	1 6%
Complicated workflow for this process	Count %	0 0%	2 13%	0 0%	2 13%	0 0%	1 6%	1 8%	1 6%	1 8%	1 6%	1 8%	1 6%
Staff duties are not well defined	Count %	0 0%	1 6%	1 8%	2 13%	0 0%	1 6%	0 0%	1 6%	1 8%	3 19%	0 0%	2 13%
Lack of knowledge of recommendations among staff	Count %	0 0%	1 6%	2 15%	1 6%	1 8%	4 25%	0 0%	2 13%	2 15%	1 6%	0 0%	2 13%
Staff resistance	Count %	0 0%	1 6%	0 0%	1 6%	0 0%	1 6%	3 23%	2 13%	0 0%	1 6%	1 8%	1 6%
Lack of knowledge of recommendations among providers	Count %	0 0%	1 6%	1 8%	1 6%	1 8%	4 25%	2 15%	1 6%	1 8%	1 6%	0 0%	1 6%
Provider resistance	Count %	0 0%	0 0%	0 0%	1 6%	0 0%	2 13%	2 15%	2 13%	0 0%	1 6%	0 0%	1 6%
Parental refusal - lack of information	Count %	0 0%	1 6%	4 31%	1 6%	3 23%	2 13%	6 46%	8 50%	0 0%	1 6%	0 0%	1 6%
Parental refusal - personal beliefs/practices	Count %	0 0%	1 6%	3 23%	1 6%	3 23%	3 19%	9 69%	8 50%	0 0%	1 6%	0 0%	1 6%
Costs	Count %	0 0%	1 6%	0 0%	1 6%	0 0%	1 6%	0 0%	1 6%	0 0%	1 6%	0 0%	1 6%
Other factors	Count %	1 8%	0 0%	1 8%	0 0%	0 0%	0 0%	1 8%	0 0%	1 8%	0 0%	1 8%	0 0%
No Barriers Exist	Count %	1 8%	6 38%	3 23%	5 31%	4 31%	5 31%	2 15%	4 25%	4 31%	5 31%	5 38%	3 19%

Figure 2. Factors identified as barriers to completing perinatal hepatitis B practices, urban vs. rural

