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WIC Participation as a Risk Factor for Loss to Follow-Up in the Wisconsin EHDI System

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Abstract

In 2011, Wisconsin's Early Hearing Detection and Intervention (EHDI) program, Wisconsin Sound Beginnings (WSB), developed multiple strategies to reduce loss to follow-up (LTFU) for babies who did not pass their newborn hearing screening: Medical Outreach, Family Outreach, Regional Outreach, and WIC Alert. WSB evaluated the outcomes of babies identified as at-risk for LTFU to determine whether WIC participation was an indicator of their risk for LTFU. Additionally, WSB evaluated whether babies who were identified as at-risk for LTFU and receiving WIC services in two WIC projects serving areas and populations with known health disparities, were at even greater risk for LTFU. WSB found no statistically significant differences in outcomes between babies who were WIC participants and those who were not. This paper discusses implications of this research for other EHDI programs.

Acronyms: ABR = Auditory Brainstem Response; CDC = Centers for Disease Control and Prevention; DRDC = Disability Research and Dissemination Center; EHDI = Early Hearing Detection and Intervention; GLITC = Great Lakes Inter-Tribal Council; LTFU = loss/lost to follow-up; MOU = Memorandum of Understanding; OAE = Otoacoustic Emission; SES = socioeconomic status, UCEDD = University Center for Excellence in Developmental Disabilities; WE-TRAC = Wisconsin EHDI Tracking, Referral and Coordination; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children; WSB = Wisconsin Sound Beginnings

Background

Early Hearing Detection and Intervention (EHDI) programs work to ensure babies are screened for hearing loss and receive timely follow-up and intervention. After a baby receives a non-passing hearing screening at the hospital, follow-up hinges on many factors. Understanding what characteristics may indicate that a family is less likely to respond to follow-up attempts, and therefore less likely to receive needed services, may help EHDI programs best direct their outreach to ensure babies receive the EHDI follow-up care they need. Research on risk factors for healthcare utilization and health outcomes has shown that low socio-economic status, low maternal education, geography, and race/ethnicity are related to lower healthcare utilization and poorer health outcomes (Boss, Niparko, Gaskin, & Levinson, 2011; Call, McAlpine, Johnson, Beebe, McRae, & Song, 2006; Centers for Disease Control and Prevention [CDC], 2009, 2013; Lu & Halfon, 2003; Smith & Boss, 2010). However, healthcare providers and EHDI programs have varying degrees of access to information related to these social determinants of health. Identifying which, if any, of these social determinants of health might be risk factors that could be appropriately relied upon to help focus follow-up strategies is important. One possible factor is a family's participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The program has low-income eligibility requirements, which might make WIC participation an adequate proxy for other established risk factors for low healthcare utilization. Nationally, the question being considered is whether collaboration between EHDI programs and WIC programs is effective in reducing loss to follow-up (LTFU) for newborn hearing screening. No studies known to these authors have shown whether WIC participation may relate to EHDI LTFU.

Wisconsin Sound Beginnings (WSB) is Wisconsin's EHDI program, ensuring all babies born in Wisconsin are screened for hearing loss, receive timely diagnosis, and access quality early intervention. When designing its LTFU prevention outreach strategies, WSB wanted to focus its efforts on families with lower socioeconomic status, lower maternal education, underserved geographic areas or members of a racial or ethnic group with known systemic barriers to positive birth and health outcomes. However, WSB did not have access to this type of baby- or family-specific information when designing its LTFU prevention strategies. Participation in the WIC program was suggested by a Wisconsin EHDI quality improvement learning collaborative in 2010 as a way to identify families with potentially lower maternal education and household income. WIC programs provide nutrition education, breastfeeding education and support, supplemental nutritious foods, and referrals to other health and nutrition services for children and families (National WIC Association, 2014, 2015). Wisconsin WIC services are provided throughout the state via more than 200 clinic sites, managed by 70 local WIC Projects, the majority of which are run by the local County (see Figure 1). Similar to other

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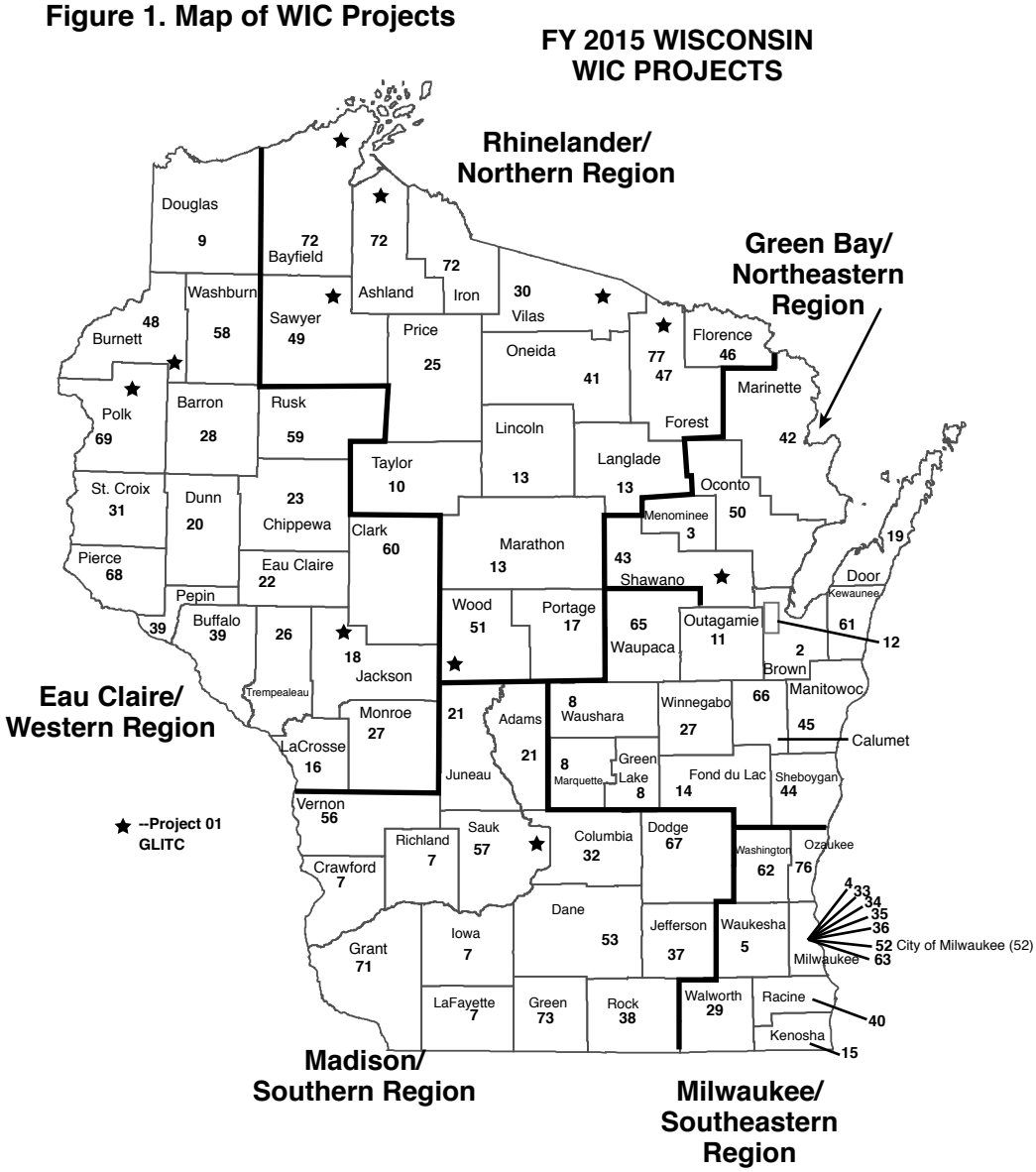
states, approximately 50% of babies born in Wisconsin are eligible for WIC (United States Department of Agriculture, Food, and Nutrition Services, 2015).

Local experts in the learning collaborative believed that potentially a disproportionate percentage of babies who did not pass their hearing screening and did not receive follow-up would also be WIC participants and that collaboration with WIC could help reduce LTFU. Additionally, they considered that a combination of geographic, racial/ethnic, and socioeconomic characteristics, plus WIC participation, could indicate an infant was at even greater risk for LTFU. Learning collaborative members suggested that (a) families receiving WIC services from a Great Lakes Inter-Tribal Council WIC site, which serves Native American families living in rural, resource-limited areas of the state; and (b) families receiving WIC services from a City of Milwaukee WIC site, which serves primarily African American and Hispanic families living in a populated, urban part of the state, would be at the greatest risk for LTFU. WSB and Wisconsin's WIC program developed and signed a Memorandum of Understanding (MOU) in 2011, giving WSB staff access to WIC's statewide data system, permission for child-specific data to be shared, and communication to take place between EHDI and WIC staff. Program evaluation was planned, and later funded by a 2-year research project (see Acknowledgements), to determine if WSB's assumptions about WIC as an indicator of risk for EHDI LTFU were correct. The results of this evaluation would have implications for other states who might wish to investigate whether partnering with their state WIC program would improve EHDI follow-up rates.

Concurrently in 2011, WSB designed and implemented four LTFU prevention strategies aimed at reducing LTFU: (a) Medical Outreach, (b) Family Outreach, (c) Regional Outreach, and (d) WIC Alert. Medical Outreach proved highly effective at resolving 60% of the cases initially identified as at-risk for LTFU. Cases that only required Medical Outreach are not included in the analysis presented in this paper. The group of babies whose cases remained unresolved after Medical Outreach was the

Figure 1. Map of WIC Projects



focus for the additional prevention strategies and is the population for whom the results in this paper are described.

WSB designed the next levels of LTFU prevention strategies around the following assumptions (a) babies identified as at-risk for LTFU and who were WIC participants would be less likely to receive follow-up than babies not in WIC; and (b) babies identified as at-risk for LTFU and WIC participants receiving services in the Great Lakes Inter-Tribal Council (GLITC) and City of Milwaukee WIC would be less likely to receive follow-up than babies not in WIC or babies at other WIC sites.

The following analysis investigates the validity of those assumptions by determining (a) if WIC participants were less likely to have their cases resolved, irrespective of the LTFU prevention strategies they received, and (b) among babies who received Regional Outreach, if GLITC and City of Milwaukee WIC participants were less likely than babies elsewhere to have their case resolved.

Methods

Design

To identify individual babies at-risk for LTFU, WSB used its real-time, web-based data system, WE-TRAC (Wisconsin EHDI Tracking, Referral and Coordination). WE-TRAC enabled WSB to determine if Wisconsin meets the benchmarks established by the Joint Committee on Infant Hearing (JCIH) 1-3-6 guidelines (JCIH, 2000). Babies who did not pass their inpatient screening at the hospital and had not had follow-up documented in WE-TRAC by 30 days of age were deemed "at-risk for LTFU." In other words, their case had not been resolved through follow-up activities including re-screening by the 1 month JCIH guideline. These unresolved at-risk cases went on to receive one or more of WSB's LTFU prevention strategies: Medical Outreach, Family Outreach, Regional Outreach, and WIC Alert. For the WIC Alert strategy, WSB used an existing notification/alert function in WIC's statewide data system to inform local WIC staff that the baby in their care needed EHDI follow-up (see Figures 2 and 3).

All babies with cases identified as unresolved received Medical Outreach (see Figure 4). During Medical Outreach, WSB staff contacted birthing units, audiologists, and primary care providers to determine (a) if there was a documentation error (i.e., the baby had already received follow-up and results needed to be documented in WE-TRAC) or (b) if the baby was actively in the process of receiving follow-up (i.e., had an appointment scheduled). If neither of these two situations were true, WSB determined that the baby's case required additional LTFU prevention. WSB determined whether the baby was a WIC participant (participation status), and any additional LTFU risk factors identified during Medical Outreach (i.e., barriers to care such as insurance issues, transportation issues, and/or non-working contact information) to determine the next LTFU prevention strategy the case would receive. Babies whose cases were not resolved by Medical Outreach fell into one of three intervention groups (see Table 1).

Group 1 included babies whose cases were not resolved by Medical Outreach alone and who were not WIC participants. After Medical Outreach, these babies typically received Family Outreach. During Family Outreach, WSB contacted the baby's family to answer any questions about the newborn screening process, provide information, and encourage follow-up. If during Family Outreach, the baby did not go on to actively engage in EHDI follow-up, WSB could not reach the family, or if additional risk factors for LTFU were identified, then the baby's case received Regional Outreach. Regional Outreach included an in-home or in-community re-screen using either Auditory Brainstem Response (ABR) or Otoacoustic Emission (OAE) equipment.

Group 2 included babies whose cases were not resolved by Medical Outreach alone and participated in WIC, but were enrolled in WIC projects other than GLITC or City of Milwaukee WIC. These cases received the Group 2 WIC Alert Strategy. WSB staff placed the WIC Alert in the baby's file in the WIC data system. All babies in Group 2 received the WIC Alert strategy and any combination of the other strategies—Family Outreach and/or Regional Outreach—as determined by their identified risk factors (see Figure 4).

Figure 2. Alerts Placed by Group

WIC Alert Group 2	HEARING SCREENING ALERT: Baby did not pass newborn hearing screening and needs follow-up. Give family Hearing Screening Follow-up Letter and review it when you interact w/family.
WIC Alert Group 3	HEARING SCREENING ALERT: Baby did not pass newborn hearing screening. Wisconsin Sound Beginnings can conduct a hearing screen with baby's next WIC appointment. Call WSB Regional Outreach Specialist 123-555-1234 to coordinate care.
2015 WIC Alert (Groups 2 and 3 receive same Alert)	HEARING SCREENING ALERT: Baby did not pass newborn hearing screening. Call WSB Regional Outreach Specialist 123-555-1234 to coordinate care.

Figure 3. Letter Babies in Group 2 Were to Receive at their WIC Clinic

Dear Parent,

Your baby's newborn hearing screen results indicate that they need an additional hearing test. Don't wait! It is very important that this next test is done immediately!

If you have questions about newborn hearing screening or need help scheduling the follow-up hearing test, ask your baby's doctor or contact the Wisconsin Sound Beginnings Regional Outreach Specialist at 1-123-456-7891. If you have any problem getting to the follow-up test, tell her. She may be able to help!

Babies learn to talk from what they hear. The first years of life are important and hearing is connected with all areas of development. If your child does have an issue with their hearing, there is help. The sooner you find out, the better it is for you and your child.

If you believe that your baby passed the hearing test in both ears, please notify your WIC contact or the Wisconsin Sound Beginnings program directly: toll-free at 1-123-555-1234. The Wisconsin Sound Beginnings Program is responsible for making sure that every baby has completed hearing testing. If you have any questions or concerns please call us at the number listed above or contact us through our website at www.improveehdi.org/wi/feedback.cfm.

Thank you for taking this very important step to help your baby grow and learn.
Sincerely,

Elizabeth Seeliger, Program Director
Wisconsin Sound Beginnings
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Madison, WI 53703

Group 3 included babies whose cases were not resolved by Medical Outreach and were receiving WIC services in a GLITC or City of Milwaukee WIC site. After Medical Outreach, this group received the Group 3 WIC Alert and Regional Outreach, the most intensive level of outreach, due to the assumption that these babies were at greatest risk for LTFU and therefore should receive the most intensive follow-up efforts (see Figure 4).

Data collected for an evaluation study of these intervention strategies were used to test the assumptions underlying the study.

Sample

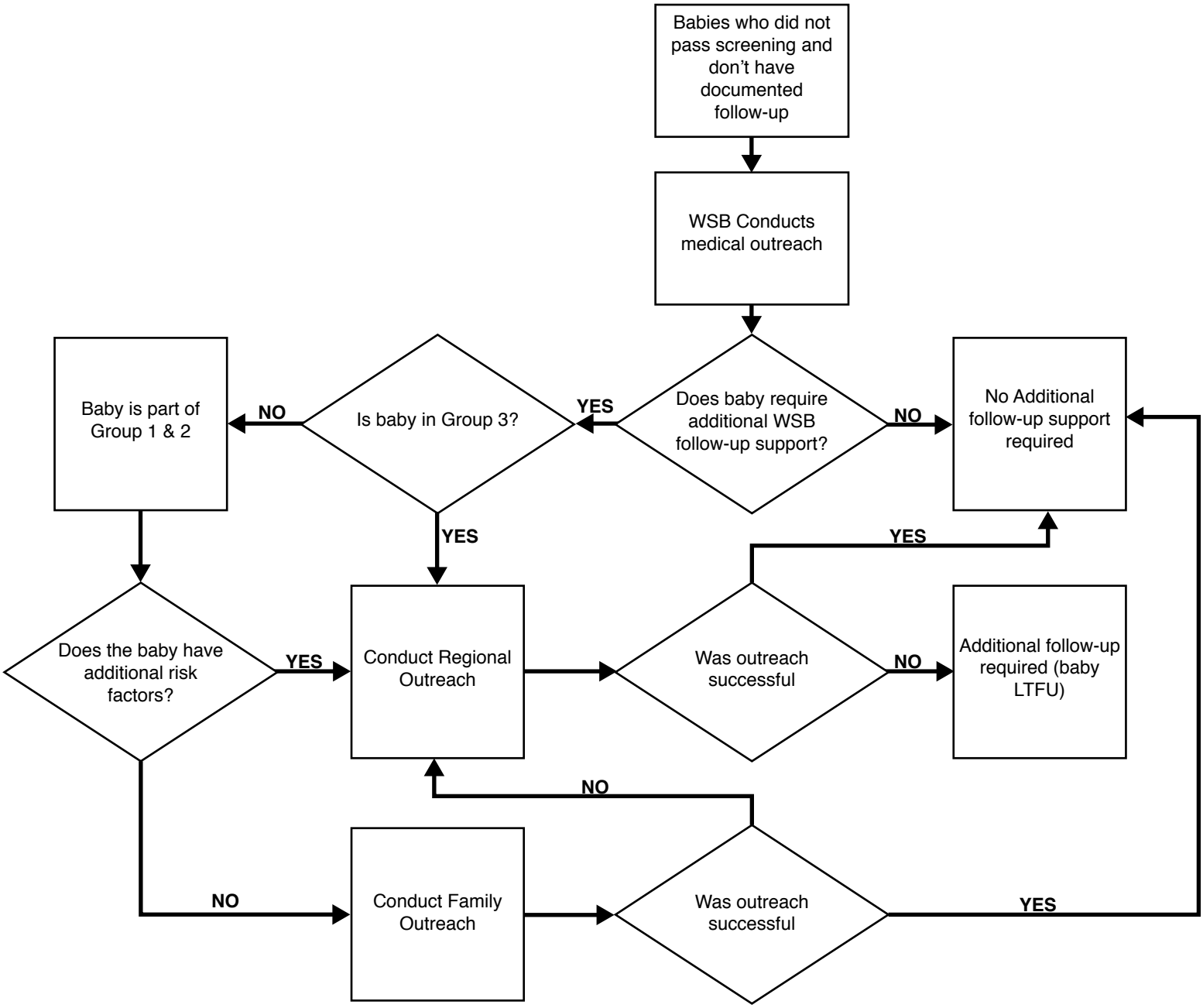
The current study focused on babies who fell into the following three categories—Group 1, Group 2, or Group 3 during 2011 to 2014. There were 489 babies whose cases were not resolved by Medical Outreach and received additional LTFU prevention strategies. Due to missing data, four of these cases were dropped from the current study, leading to an analytic sample of 485. This included a relatively equal distribution across the study period, with 51 (20.5%) babies who were born in 2011 (study started in mid-2011), 168 (34.6%) babies in 2012, 153 (31.6%) babies in 2013, and 113 (23.3%) babies in 2014. The 485 babies were categorized into the three groups, with 262 babies (54%) that fell into Group 1, 189 (39%) in Group 2, and 34 (7%) in Group 3 (see Table 1).

Babies could receive a number of different LTFU prevention strategies. Within the sample of 485 babies, 73% (354/485) received Family Outreach, 46% (223/485) received a WIC Alert (Groups 2 and 3) and 33% (160/485) received Regional Outreach. Furthermore, 59% (286/485) received one intervention, 30% (145/485) received two interventions, and 11% (53/485) received all three interventions. Of the 485 babies receiving LTFU prevention, 79.6% (386/485) had their case resolved (i.e., re-screening, diagnostic audiology services and/or referral to early intervention were completed) and did not become LTFU.

Measures

The dependent variable in this study was Case Resolution. A baby's case was defined as resolved if the baby received follow-up services (i.e., re-screening, diagnostic audiology services, and/or referral to early intervention). The baby's case was defined as LTFU if the baby did not receive follow-up services, regardless of reason.

Figure 4. Work Flow for Babies Identified as At-Risk for LTFU



Note. LTFU = loss to follow-up; WSB = Wisconsin Sound Beginnings.

There were three covariates used in this study. First, study authors created a measure, Intervention Amount, to indicate the amount of WSB-intervention that each case received. The Intervention Amount was defined as the sum of LTFU prevention strategies received (Family Outreach, Regional Outreach, and WIC Alert). Cases could receive between one and three of these strategies. Second, study authors created a variable, Any WIC, to indicate whether the case received WIC services from any of the Group 2 or Group 3 WIC sites. Third, study authors created a variable to indicate whether babies were Group 3 (GLITC or City of Milwaukee WIC), Group 2 (WIC participation in any of the other WIC sites) or Group 1 (no WIC participation) babies.

Analyses

Two sets of analyses, using SAS 9.4 (SAS Institute, Cary NC), were conducted to examine whether WIC participation was a risk indicator for EHDI LTFU. The first set of analyses aimed to answer whether WIC participants were less likely to have their case resolved irrespective of the number of LTFU prevention strategies they received. Study authors conducted a logistic regression analysis in which Case Resolution was regressed on the Any WIC variable and the Intervention Amount variable (Model 1). The authors also analyzed whether Group 3 babies (the group assumed to be at highest risk for LTFU) compared to Group 1 and

Table 1. Description and Distribution of Groups

Group	Description	Distribution
Group 1	Babies whose cases were not resolved by Medical Outreach and were not WIC participants. Received Family Outreach and/or Regional Outreach.	54% (262/485)
Group 2	Babies whose cases were not resolved by Medical Outreach and received WIC services in other WIC sites (not GLITC or City of Milwaukee). Received WIC Alert and Family Outreach and/or Regional Outreach.	39% (189/485)
Group 3	Babies whose cases were not resolved by Medical Outreach and received WIC services in a GLITC or City of Milwaukee WIC site. Received WIC Alert and Regional Outreach.	7% (34/485)

Note. GLITC = Great Lakes Inter-Tribal Council; WIC = Women, Infants, and Children.

2 babies, were less likely to have their case resolved, controlling for the Intervention Amount (Model 2).

The second analysis attempted to understand whether Group 3 babies who received Regional Outreach were less likely to have their case resolved than Group 1 and Group 2 babies who received Regional Outreach. Group 1 and 2 cases that received Regional Outreach included cases that were not resolved by any of the other interventions and would be the best comparison to Group 3 babies who were assumed to need this most intensive intervention from the beginning. If the Group 3 babies were found to be less likely to have their case resolved than the other groups, this might suggest that the assumption WSB made might be correct for babies who were WIC participants in GLITC or Milwaukee WIC projects. To test this, study authors created a subset of the data to only include cases that received Regional Outreach (n = 161). Then, study authors conducted a Chi-square analysis to examine differences in Case Resolution rate distributions for two groups—Group 3 babies vs. Group 1 and 2 babies.

Results

Analyses were conducted to determine whether WIC participation was a predictor for a case being LTFU rather than resolved. Specifically, the first set of analyses aimed to answer whether WIC participants were less likely to have their case resolved irrespective of the amount of intervention they received compared to non-WIC participants. Model 1, which compared the likelihood of case resolution between babies who had any WIC participation to babies that did not have WIC participation, controlling for the amount of intervention they received, suggested that WIC participation was not related to case resolution (p = .07). Furthermore, Model 2, which compared the likelihood of case resolution between babies that had GLITC or City of Milwaukee WIC participation to everyone else, controlling for the amount of intervention they received, showed that GLITC and City of Milwaukee WIC participation was not related to case resolution (p = .31). See Table 2 for additional details. This suggests that WIC participation may not act as an indicator of risk for LTFU.

The second set of analyses, conducted for cases that received Regional Outreach, investigated whether there were differences in case resolution between GLITC or City of Milwaukee WIC participation (Group 3) and all other babies who received Regional Outreach (Group 1 and Group 2). Among Group 3 babies that received Regional Outreach (n = 20), 85% had their case resolved. Among Group 1 and 2 babies that received Regional Outreach (n = 141), 68% had their case resolved. Although initially this might look like an important difference, the chi-square analysis revealed that the distributions for case resolution between the groups were not statistically different ($\chi 2$ = 2.39, p = .12). This suggests that even among the most difficult-to-resolve cases, GLITC/City of Milwaukee WIC participation may not be an indicator of risk.

Discussion

WSB designed its LTFU prevention outreach on assumptions that (a) babies identified as at-risk for LTFU and who were WIC participants (Group 2 and 3) would be less likely to receive follow-up than babies not in WIC (Group 1); and (b) babies identified as at-risk for LTFU and WIC participants receiving services in GLITC and City of Milwaukee WIC (Group 3) would be less likely to receive follow-up than other babies (Group 1 and 2). When WSB initially designed its targeted LTFU prevention strategies and its process for identifying the target population of babies at-risk for LTFU, WSB did not have access to data elements such as maternal education, race/ethnicity, or

Table 2. Summary of Logistic Regression Analyses for Variables Examining WIC as a Predictor of Risk for Becoming Lost to Follow-up (N = 485), Controlling for Intervention Amount

	Model 1			Model 2		
Variables	B	*SE B*	e^B	B	SE B	e^B
Any WIC (Group 2 and 3 vs Group 1)	0.54	0.30	1.72	--	--	--
GLITC and City of Milwaukee WIC (Group 3 vs Group 1 and Group 2)	--	--	--	0.50	0.50	1.66
Intervention Amount	-0.71**	0.20	0.49	-0.48**	0.15	0.62
χ^2	12.73**			10.43**		
df	2			2		

Note. e^B = exponentiated B; GLITC = Great Lakes Inter-Tribal Council; WIC = Women, Infants, and Children. Intervention Amount ranged from 1 to 3.
**p < .001.

family income. WIC participation, with its established income eligibility limits, seemed like an appropriate proxy for lower socioeconomic status (SES). Assumptions around income as a risk factor emerged from the learning collaborative and were supported by evidence indicating that the lowest levels of education and income are most common and persistent among subgroups that also exhibit the poorest health outcomes (Boss et al., 2011; Braveman, Cubbin, Marchi, Egerter, & Chavez, 2001; Cutler & Lleras-Muney, 2006; Smith & Boss, 2010). However for the first assumption, study results indicated that babies who did not pass their hearing screening and were enrolled in WIC were no more or less likely to have their cases resolved than families not participating in WIC. Either WIC participation did not serve to identify the babies with lowest SES, which might put them at high risk for LTFU, or SES was not the important LTFU risk indicator WSB assumed it would be.

Within the WIC participant populations described in this study, WSB identified WIC projects that served families with potentially a greater number of cumulative risk indicators for poor health outcomes, with the contributions of low SES, geographic, and racial/ethnic barriers to accessing services. WSB used WIC status in two particular WIC projects (GLITC and the City of Milwaukee) to serve as a proxy for these additional cumulative risk factors. However, these analyses suggest that regarding the second assumption, populations in these two WIC groups were not more at risk for LTFU than either non-WIC participants or participants in other WIC projects. In fact, because WSB designed its LTFU prevention strategy based on the belief that Group 3 babies would be at greater risk for LTFU, WSB provided them immediately with Regional Outreach and bypassed Family Outreach. When comparing Group 3 babies with other babies who also received Regional Outreach, there was not a statistically significant difference in outcomes. This suggests that even among the most difficult-to-resolve cases, WIC participation in a locale thought to be at higher-risk for LTFU did not appear to indicate a greater risk for LTFU when intensive prevention strategies were available.

Additionally, when controlling for the amount of intervention babies in the three groups received, there was no statistically significant difference in outcomes. In fact, the more prevention strategies a case received, the less likely the case was to be resolved. This is most likely due to the design of WSB's LTFU prevention strategies, which work as a funnel, with the most at-risk cases receiving the most intensive strategy, Regional Outreach.

WSB's analysis also found that a smaller percentage of babies than anticipated were identified as at-risk for LTFU and also were identified as WIC participants. Although state and national estimates identify 50% of babies as eligible for WIC, less than half of the babies identified as at-risk for LTFU beyond Medical Outreach were WIC participants.

Limitations

The findings in this evaluation are subject to the following limitations: (a) Prior to 2011, WSB reported information retrospectively (typically six months after the last birth of the previous year) on babies who were LTFU. The tracking of babies at-risk for LTFU began concurrently with the implementation of the LTFU prevention strategies. Therefore, comparisons to baseline data analyses were not possible. (b) The small sample size for some analyses led to reduced power to detect differences between groups. Thus, if study authors had a larger sample with which to conduct analyses, study results may have been different. (c) Additionally, WIC participation remains unknown for babies whose cases did not require support beyond

Medical Outreach. Since Medical Outreach resolved 60% of the cases initially identified as potentially at-risk for LTFU, this represents a comparatively large group of babies whose risk factors and WIC participation remains unexplored.

Implications and Future Directions

Although state EHDI programs made significant progress in the past decade increasing the percentage of babies screened from 83% to 98%, most recent data indicates 32% of babies who did not pass a hearing screening were still reported as Lost to Follow-Up (as defined by CDC) or Lost to Documentation (CDC, 2003; Williams, Alam, & Gaffney, 2015). WSB offers the following suggestions for decreasing the LTFU rates based on implications of this evaluation: (1) Targeting Outreach, (2) Analyzing LTFU, (3) Predicting Populations At-risk for LTFU, and (4) Stabilizing and Building Systems.

1) Targeting Outreach: To use limited resources most efficiently, EHDI programs often focus outreach efforts on targeted populations to see the greatest reductions in loss to follow-up while using the least amount of resources. However, states may be determining the target population without access to the descriptive data necessary to make evidence-based predictions of who is at-risk for LTFU. They also may not be able to easily evaluate who is LTFU. This makes it nearly impossible to assess whether their targeted outreach positively impacted the intended populations. This study demonstrated that assuming that WIC participation was a proxy for SES did not prove an effective method for identifying at-risk populations to target LTFU prevention in Wisconsin.
2) Analyzing LTFU: The LTFU population in Wisconsin is now so small (less than 145 babies in 2014) that the remaining unresolved cases have few common characteristics to use to inform population-based outreach. EHDI systems frequently rely on data trends from previous year(s) to predict who might be LTFU in the coming year. Targeting LTFU to a particular population demographic/geographic area may not be the most effective method when the LTFU population is so small.
3) Predicting Populations At-Risk for LTFU: The underlying assumption that there would be a disproportionate percentage of babies at-risk for EHDI LTFU who were WIC participants impacted how WSB designed its LTFU prevention strategies. The reasons that this did not prove to be an effective way to identify babies at risk for LTFU are not clear. WSB has begun to examine additional factors including whether a family able to enroll in a program such as WIC, may be better equipped to access other kinds of programs and support systems, such as EHDI follow-through.
4) Stabilizing and Building Systems: EHDI programs also need to focus efforts on building greater systems to support babies at-risk for LTFU. The CDC recommends EHDI programs investigate strategies to reduce LTFU that take advantage of new and creative collaborations and opportunities (Williams et al., 2015). Like Wisconsin, other state EHDI programs may also be housed within the same department as their state's WIC programs, making an EHDI and WIC collaboration well-aligned to meet this recommendation. The WSB-WIC partnership, organized and solidified by the MOU, with both the state WIC program and local WIC, allowed WSB to implement the WIC Alert LTFU prevention strategy while placing a minimal burden on WIC staff. By allowing EHDI staff access to the existing WIC data system, EHDI staff assumed the task of placing the Alerts. This was efficient because it did not require any costly, time-consuming development of information systems linkages. It was also effective because the EHDI staff knew which babies needed which intervention strategy. By using an existing Alert mechanism within the data system that local WIC clinics were familiar with, the need for WIC staff training was minimal.

In 2012, WSB developed a data use agreement with Wisconsin's vital records office, providing WSB with demographic information, including race/ethnicity, maternal education, and maternal age on a baby-specific basis. One area for future investigation in Wisconsin is to evaluate whether there are any trends or common characteristics among babies identified as at-risk for LTFU and those who become LTFU. In 2015, Wisconsin started documenting these key demographic characteristics for each individual baby identified as at-risk for LTFU, including cases resolved by Medical Outreach alone, to determine if there are any demographic trends that might inform future LTFU prevention efforts.

Conclusions

Since implementing its LTFU prevention strategies in 2011, WSB reduced by nearly 50% the number of babies who did not pass their hearing screening and did not receive follow-up (WSB Annual Report, 2014, 2015). WSB has maintained this lower LTFU rate (WSB Annual Report, 2014, 2015). Along with reducing LTFU through its four prevention strategies, WSB has increased its partnerships, improved its data quality, and conducted more regular data analysis. The goal of these efforts is to continue to design and implement efficient, effective, high-leverage strategies that reduce LTFU and improve and stabilize EHDI systems of care.

WSB targeted outreach to families participating in WIC as one way to design efficient and effective LTFU prevention strategies. Despite WSB finding no statistically significant differences in EHDI follow-up outcomes between WIC participants and non-WIC participants, WSB programmatically determined that the WSB-WIC partnership remains important. Particularly when trying to reach families that may not be accessing any other systems, such as primary care or EHDI follow-up care, WIC participation remains an important opportunity to successfully reach families. For some individual babies identified as at risk for EHDI LTFU and who were enrolled in WIC, the WIC-WSB partnership meant the difference

between the baby's case being resolved or not. Additionally, Wisconsin WIC remains an informed, committed partner in reducing LTFU for babies who did not pass their hearing screening. WIC staff report continued interest in assisting families in getting EHDI follow-up services as part of their overall mission to refer and connect children with appropriate services.

Although WIC participation was not a predictor of LTFU in Wisconsin, it may be one in states with a higher LTFU rate, less access to additional demographic characteristics, higher poverty rates, higher WIC enrollment, or other factors. The WSB-WIC collaboration allowed WSB to investigate whether this was an effective mechanism to leverage EHDI resources. Although not statistically significant, the partnership did enable Wisconsin Sound Beginnings to support families that would not have been reached through traditional EHDI channels. This has made the WIC-EHDI partnership valuable.

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