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Facilitating Factors and Barriers to Newborn Screening Uptake in the Cordillera Administrative Region and Region V

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RESEARCH ARTICLE

Abstract

Background: Republic Act 9288 or the Newborn Screening Act of 2004 was enacted. A multi-sector effort towards systematic screening of newborn disorders and built-in systems for subsequent confirmatory tests for positively screened as well as treatment for confirmed cases was likewise implemented. Despite multi-sector efforts and continuous quality improvement mechanisms, national newborn screening coverage remained low for several years.

Objective: The study determined factors that influence Newborn Screening (NBS) uptake from various perspectives: mothers, health providers, and program administrators.

Methods: Framework analysis of NBS program documents, 25 focus group discussions and 37 key informant interviews of mothers, health providers and program administrators were done in purposively selected communities in the Cordillera Administrative Region and Region V.

Results and Conclusions: Findings showed the need to disseminate correct NBS procedures, especially upon obtaining positive results. Financing issues were addressed innovatively, but system administrators and health providers required a common understanding of program implementation. Monitoring geographically hard-to-reach areas remained a challenge. Barriers outside the system adversely affected filter cards availability, specimen transport, and release of results. Improved online and paper-based educational campaign, greater local government unit support, streamlined PhilHealth processes, a workload-based manpower complement for monitoring, and continuity clinics to handle positive findings can increase NBS uptake.

Keywords: *newborn screening, perceived merits, attitude and intent, facilitating factors and barriers to uptake*

Introduction

Newborn screening (NBS) is growing rapidly as a public health program in many parts of the world [1,2]. In the Philippines, the NBS Act of 2004 prompted various stakeholders led by the Department of Health (DOH) and the Newborn Screening Reference Center (NSRC) to design and implement the NBS program to ensure that every baby born undergo NBS [3]. The program has built-in evaluation mechanisms such as the Performance Evaluation and Assessment Scheme (PEAS) which involve periodic performance assessments at the regional and health facility levels for quality improvement [4].

Despite these multi-sector efforts and continuous quality improvement mechanisms, national coverage was only 16% three years after [5]. DOH then aimed to increase coverage to 85% in 2010 [6]. Still, actual coverage was only 57% at the end of 2013 [5].

Padilla, *et al.* in 2009 cited reasons for low coverage: 1) not all health practitioners are convinced of NBS merits; 2)

most parents do not fully understand the merits; 3) unaffordable screening costs; 4) no penalties for Newborn Screening Facility (NSF) non-compliance; 5) unorganized advocacy campaign; and 6) home deliveries [7]. These barriers may be classified into system-, provider- and mother-related factors. Identifying factors and studying their roles and inter-relationships defined best practices and barriers to NBS uptake.

This study identified factors influencing NBS uptake, or the intent of a mother to allow her newborn to undergo screening. This was done from the perspectives of mothers, their health providers, and program administrators. It identified facilitating factors and barriers to NBS uptake; and compared the results of the two selected regions in the country: the Cordillera Administrative Region (CAR) and Region V.

Methodology

Study Design

This qualitative investigation utilized focus group discussions (FGDs) and key informant interviews (KIIs). A total of 12 FGDs and 15 KIIs were conducted in CAR. In Region V, 13 FGDs and 22 KIIs were accomplished.

Setting and Sampling

CAR was chosen because it had the highest NBS coverage, 67%, in 2010. Region V, which reportedly had a low coverage of 22% on the same year (8) was selected. For each region, three provinces representing different economic classes were purposively selected. A city or a municipality belonging to the hospital's or health facility's catchment area was chosen from each province. Hospital sampling was determined by level of care and accessibility. Individuals and FGD participants were purposively selected.

Data Collection

A desk review of websites, organizational structure and relevant documents was conducted to construct a flowchart of procedures necessary to understand the different steps of NBS such as processes of offering NBS to women, availing of NBS, releasing of results, and referrals and counselling. The flowchart was not shown in this article.

Interviews of Newborn Screening Center (NSC) Heads, directors of health facilities, NBS coordinators at the regional, provincial, city or municipal and facility levels in private settings were conducted.

Aside from the facility NBS coordinator, two health workers involved in NBS in each selected facility were interviewed separately: a doctor (obstetrician/ paediatrician/ general practitioner/ family medicine specialist), and a nurse or medical technologist in-charge of heel pricks, including a social worker or administrative personnel in-charge of finances and administrative matters. KIIs of NBS administrators and health workers were conducted to understand the operations of the NBS program and the features of the system from various perspectives. A mother who availed of NBS and another who did not were interviewed separately to provide feedback to the service and operations of the program.

FGDs with 6-12 participants each were conducted separately among midwives and Barangay Health Workers (BHWs). Two more FGDs were conducted among mothers who availed of and mothers who did not avail of NBS to identify mechanisms that hindered the use of NBS services and to determine initiatives to address barriers.

A trained facilitator led the discussion with guide questions to uncover system-provider-mother mechanisms that affected NBS uptake.

Data Analysis

In the context of NBS uptake, an analysis of the links of mothers, providers and the NBS system was guided by the conceptual framework below (Figure 1).

As identified by study leaders and research staff during workshops, common themes pertaining to the facilitating factors, barriers and recommendations from verbatim transcriptions together with the findings of the desk review formed the bases for a NBS flowchart. Results were validated through separate fora with key informants and FGD participants in each region. Regional multi-disciplinary research teams presented results to each other for cross-validation of findings and analyses.

Ethics Review

The research was approved by the UP Manila Research Ethics Board (UPM-REB 2013-043-01).

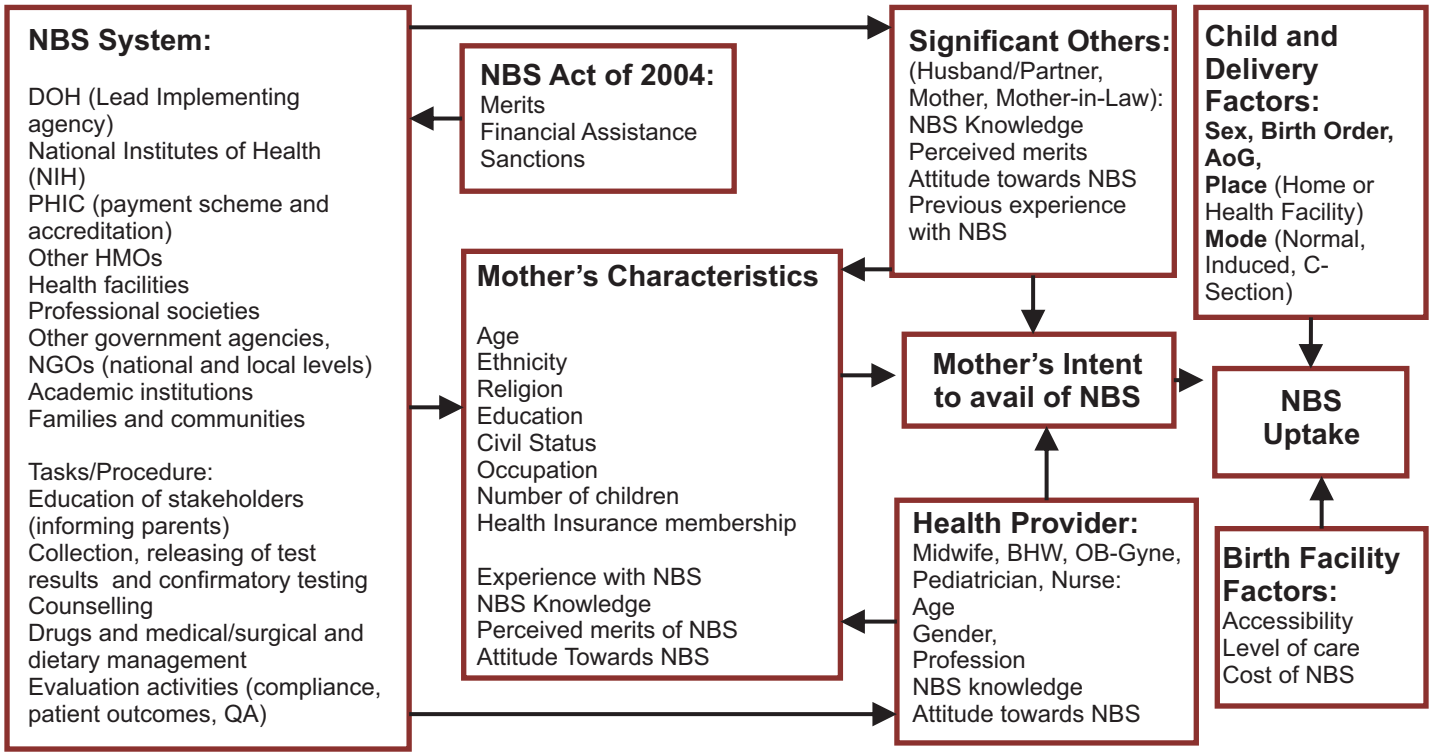

Figure 1. *Conceptual Framework*

Results and Discussion

Facilitating Factors to NBS Uptake

NBS Act of 2004. The implementation of NBS Act of 2004 steadily increased the percentage of newborns screened through time [5].

NBS System. Since 2004, NBS coverage in the Philippines consistently increased as mentioned earlier. As shown in Table 1, the facilitating factors were 1) health facilities licensing whereby NBS was a requirement; 2) DOH Administrative Order 2008-029 promoting facility-based deliveries; and 3) a system of monitoring and coordination from regional to facility level.

Majority of the facilitating factors were common to both regions. CAR's innovative monitoring strategies, coupled with effective regional coordination resulted to consistent high morale and motivation among administrators and health providers. CAR retained its status of having the highest coverage, reaching 84.2% in 2013 [8].

Through PhilHealth's Maternity and Newborn Care Package, NBS was covered for members and indigent families. Education, the first key component of the NBS System identified by NBS administrators [7] was achieved by effective information education and communication (IEC) materials. Poster of treated and untreated children with congenital hypothyroidism and handy three-fold pink pamphlets were distributed in the health facilities. The two regions also employed innovative IEC strategies. CAR targeted far-flung communities and incorporated NBS in the youth peer education program. Region V used an on-going orientation and education program for LGU officials. Newly-elected officials were informed of NBS objectives and benefits while serving officials' knowledge were reinforced. Region V also reproduced IEC materials.

While the Bicol region's unique topographical characteristics required NBS personnel covering a lot of ground, initiatives had been highly creative and innovative. The best practices include: 1) projecting the demand for and advance requisitioning of filter cards and NBS kits; 2) inclusion of filter cards in the supply budget and annual procurement plan; 3) DOH-ROs tapping DOH Representatives to monitor and provide weekly monitoring updates; 4) constructing more BeMONC facilities in strategic areas, leading to more facility-based deliveries; 5) strong support by facility administrators, and strict implementation of NBS policies; 6) concerted effort to convince

Table 1. *Facilitating factors common and unique to CAR and Region V*

Facilitating Factors	CAR	Region V
General NBS System	• NBS as a law and policy to be followed • NBS as a requirement for accreditation and licensing • DOH Administrative Order (AO 2008-0029) promoting facility-based deliveries and the thrust to make every birthing facility an NSF	
	• Innovative monitoring strategies: prioritized hard to reach areas, included in licensing activities, maintenance of a database of patient information	• Innovative monitoring strategies: Partnership with local police authorities in tracking down patients and the "caddy" system
	• Effective regional coordination	• Creation of NBS Council that meets quarterly to discuss issues and problems of the region • Role of NBS coordinator of province as DOH representative to the local health board provides opportunities for advocacy
Funding	• PhilHealth through its newborn package is a major source of funding; indigents are covered through the 4Ps	
IEC	• Buntis classes and Mothers' classes in the barangay level increase yield of facility-based deliveries • House-to-house visits by community health teams for information dissemination and data gathering	
	• Incorporating NBS in the peer education training for out- and in-school youth and other education campaigns such as IECs to teenage mothers • Community Social Development Scheme (CSDP) visits every three months in all barangays for information dissemination	
Health Providers	• Effective teamwork	• "Caddy" system – unique coined term of BHWs' efforts to accompany mothers for screening, confirmatory testing and treatment when needed
Mothers	• Positive attitude towards NBS of mother's significant others	
	• Easy to convince patients who are not aware of NBS	• Capable of verbalizing benefits of NBS to fellow mothers

mothers to effectively promote NBS; and 7) coordinators meeting with NSC and NSRC via Skype.

Health Providers. Region V NBS coordinators and health providers claimed innovative monitoring strategies like their partnership with the local police force to track down patients. The BHWs also practiced "caddy system," their own innovation whereby they accompany mothers from screening and, when needed, to repeat testing including search for funding for confirmatory testing and treatment. The establishment of NBS council facilitated coordination across the region; provincial NBS coordinators as members of the local health board promoted NBS. These facilitating factors increased uptake at 48.3% in 2013 [8].

Both regions conducted community-based classes for pregnant women and mothers; and house-to-house visits by community health teams. These strategies aided in monitoring by generating a list of pregnant women, expected deliveries, and NBS compliance in the locality. In CAR, Community Social Development Scheme or CSDS, a program done quarterly to monitor pregnancies, family planning methods, and health-related concerns of households in all barangays was conducted in all barangays every three months.

Education was not limited to communities; health providers were trained by the DOH, NSRC and NSCs. In some cases, RHUs and health facilities also trained health workers. The knowledge and skills of the health providers coupled with their commitment to the goals of NBS (house-to-house campaign of BHWs; strong spirit of volunteerism; initiative to refer detected cases to specialists) promoted uptake in both regions.

Teamwork among health providers was essential to the success of the NBS program. In a health office in Region V, everyone directly involved in the NBS process maintained a high level of coordination and cooperation under the leadership of the health officer.

Mother's Characteristics. In order to increase mother's awareness and knowledge about NBS, CAR utilized various IEC materials like pamphlets, hand-outs and radio announcements targeting various age groups and sectors. CSDS was used for NBS advocacy. In line with the Save Babies advocacy, NBS was tackled during mothers' classes, immunization days, and peer education training for both out-of-school and in-school youth. IEC materials were provided during pre-natal care and a day prior to the conduct of the NBS procedure. The importance of NBS also formed part of the Family Health Diary. A parent advocate talked about NBS importance to a group of parents. One-on-one information dissemination to mothers was also done. Advocacy was centered on areas with low or poor accomplishments as well as the most remote areas.

In both regions, mothers and their significant others were generally well-informed of NBS benefits. In CAR, mothers who were not knowledgeable of NBS were easily convinced of the importance of screening. Some were even willing to pay out-of-pocket. In Region V, some mothers discussed NBS benefits with fellow mothers while others committed to recommend NBS.

Barriers to NBS Uptake

Despite the system support, the diligence and commitment of administrators and health providers; and the willingness of most mothers to avail, national coverage of 57.3% remained below the 2010 target. As mentioned earlier, Region V coverage improved, but was still among the lowest while CAR was closest to the target [8]. Hampering NBS uptake were: 1) inefficient courier services; 2) quick personnel turnover; 3) lack of filter card supply; and 4) unclear PhilHealth processes and benefits related to NBS. Table 2 summarizes the barriers to NBS uptake and corresponding recommendations to transcend the barriers.

NBS Act of 2004. NBS cost was a major barrier in screening newborns. The inclusion of NBS in the PhilHealth maternal package boosted uptake. However, there remained unclear processes in PhilHealth reimbursements. Furthermore, some mothers do not know that NBS was an entitlement of PhilHealth members.

In Region V, a challenging barrier to NBS uptake was the lack of knowledge of PhilHealth entitlements among 4Ps members or dependents. A more concerted effort to generate a clearer understanding of coverage and benefits, specifically NBS-related, may lead to higher rates of PhilHealth membership and NBS availment. PhilHealth members were more likely to allow their children to be screened [9]. While PhilHealth Circular #20 series of 2007 [10] stated that NBS tests can be reimbursed within 3 days of birth, this can be extended up to seven days when the baby requires intensive care. However, few health providers seem to be aware of such PhilHealth coverage intricacies.

Table 2. *Barriers to NBS Uptake and Recommendations*

Factors	Barriers	Recommendations
NBS System Structure	◆ Inaccessible and disadvantaged areas hamper delivery of NBS	◆ Establishment of more NSFs and NSCs in strategic areas
	◆ Physical distance of NBS Regional coordinators to their NSCs	◆ Use of video-conferencing such as Skype during bi-monthly meetings of coordinators
	◆ Continuity of NBS program in the midst of changes in the DOH structure	◆ Sustained leadership in the CHD medical NBS coordinator position
	◆ Confusion among health providers on the correct timetable for NBS testing	◆ Continuing education (both online and face-to-face formats)
	◆ Some NSFs refuse to do repeat testing	
	◆ Inefficient process of relaying results partly due to inefficient courier services and lack of coordination among the concerned NBS players such as NSC, NSFs (causes delay and discourages mother to avail of NBS)	◆ NSFs to maintain a logbook of results; NSCs to shorten the time to results release especially in congenital hyperplasia; results may be given to mothers on post natal check-ups; results given direct to both mother and health facility
	◆ Challenges in handling positive screen results	◆ Setting up of confirmatory centers within the region
	◆ Handling of confirmed cases (cost, absence of specialists in the regions specially Region V)	◆ Decentralized structure with NSCs and continuity clinics spread regionally; Use the TB program model where free additional diagnostic tests for positive screens and treatment for confirmed cases are provided; Government to mobilize on-board paediatricians; Video conferencing via Skype with specialists.
Financing (PhilHealth-related)	◆ Delay in reimbursements	◆ Streamlined and standardized Philhealth reimbursement processes
	◆ Lack of standardized procedures of Philhealth on the minimum requirements to be given a card	◆ Streamlined procedures for PhilHealth enrolment
	◆ Non-utilization of PhilHealth benefits	◆ Information campaign that NBS is covered by PhilHealth targeting not only communities but health providers as well
	◆ Non-membership to PhilHealth [not qualified for 4Ps (Pantawid Pamilyang Pilipino Program) but also do not have PhilHealth through employment or could not pay membership fees]	◆ Review of the policies and implementation of 4Ps ◆ Government to provide PhilHealth coverage to all Filipinos specially indigent constituents (Universal Health Care)

Factors	Barriers	Recommendations
IEC	◆ Advocacy not reaching GIDAs	◆ Focus advocacies in areas who had low and poor accomplishments and hard to reach places; IEC thru radio
	◆ Mother was given leaflets but NBS was not explained; Mothers are aware of NBS in general but do not know the details.	◆ Use of an appropriate local dialect; Intensify advocacy and awareness programs; More information in IEC materials including PhilHealth coverage; Schedule NBS classes for mothers; Use Child Survival Checklist to remind mothers
Health Providers	◆ Insufficient knowledge (such as how to handle confirmed cases) and training of health providers	◆ DOH trainings and seminars of BHWs; Involve and give seminars to community health teams (CHTs) including nutrition scholars; Echo-seminars of fellow midwives and BHWs; More information on what NBS can actually detect and prevent is needed
Mothers	◆ Families unprepared (financially) for delivery and NBS	◆ PhilHealth Enrollment; Early preparation by saving not only for the delivery but also for NBS; Automatic PhilHealth coverage for mothers when they give birth at health facilities
	◆ Lack of knowledge of NBS among mothers and families.	◆ More information on what NBS can actually detect and prevent is needed.
Child and Delivery Factors	◆ Home deliveries --some mothers still prefer to deliver at home to save on expenses; one mother had short duration of labour, too short to go to a facility; some still trust traditional health workers	◆ Traditional health workers (Hilots) must be obligated to report home deliveries to RHU within 24 hours.

Hospitals usually billed separately for different charges, e.g., for doctor's professional fees, medicines. As a result, patients did not view NBS as a necessity but, rather, as an additional expense they may decline. To prevent exclusion, a single total hospital bill including the NBS cost was recommended.

NBS System. Despite PhilHealth coverage of NBS, there was lack of funds to purchase filter cards and to sustain operations of most NSFs, especially in government facilities. Health providers who run out of kits brought babies to other NSFs where kits were available. This is a disincentive on the NSF where the baby was born due to the discrepancy of statistics between number of babies born and screened babies. A system of sharing filter cards within the municipality had been suggested.

Reimbursement delays and unstandardized procedures of PhilHealth caused the depletion of NSFs' revolving funds. Hence, NSFs became incapable of providing NBS for all babies born in the facility.

For geographically challenged NSFs, additional travel costs to courier office to send and pick up specimen or communications were not covered in the NSF operations budget.

Addressing financial challenges were 1) inclusion of filter cards in the RHU supply budget and the annual hospital

procurement plan; and 2) anticipated purchase requisitioning. The NBS administrator suggested a "50-50 sharing of filter card supplies between the national administration and the LGU based on a projected number of births in a province or municipality". Other recommendations to address lack of financing according to NBS stakeholders were shown in Table 3.

Just like monitoring, the NBS IEC campaigns suffered in GIDAs of both regions. Intensifying advocacy efforts in hard-to-reach and low coverage areas was recommended. A more concerted IEC campaign among NBS players to be led by DOH was recommended as well as inclusion of PhilHealth coverage and use of vernacular in IEC materials. There is a need to develop region-specific IEC materials subject to NSRC approval. Region V may also conduct an intensive media campaign.

Continuity of the program was considered a problem for both regions; more challenging in Region V due to fast turn-over of NBS leadership. Rationalization of DOH-RO personnel affected the organizational set-up of Family Cluster Units and NBS within the DOH-ROs. Proper endorsement to new people was seen as a potential problem. Guidelines (contained in NSF welcome letters) often merited a cursory glance and were given scant attention by health providers. This resulted in confusion on the recommended period to perform NBS. Continuing education from the NSC to the BHW level was recommended.

The regional coordinating team of Region V should be strengthened to allow efficient monitoring and coordination. Another coordination barrier was the region's distance to NSC-NIH. Better infrastructure for tele- or video-conferencing will allow regular virtual meetings among coordinators as well as support emergency meetings. Similar to CAR's practice, monitoring activities should form part of the DOH's licensing requirements for facilities.

Negative NBS results usually took a couple of months to be released by mail; and both text message and mail for positive results. The negative result, according to mothers, was not explained anymore. The inefficient process of relaying results caused delay in informing mothers of positive NBS findings. Furthermore, there seemed to be no mechanism in place to properly trace false negative results of NBS.

NSFs may do repeat testing for slightly elevated results. Only significantly elevated results were immediately referred to the NSC for confirmatory testing. However, some NSFs refused to do repeat testing.

Confirmed positive cases may not be diagnosed and treated due to lack of financial resources for medical expenses; and distance of the health facility from the community. Corollary to the latter was the absence of specialists in the regions. According to David-Padilla, et al. (2009), "If the NSF does not have specialists, it is their responsibility to arrange the referral"[7].

Many parents did not have adequate funds for subsequent laboratory tests, resulting in unconfirmed positive screen results. The laboratory for confirmatory testing was located in Manila for Region V and in Pampanga

Table 3. *Recommendations to address lack of financing*

Recommendations	NBS Stakeholder
DOH-ROs to avail funds from the government of the Philippines; Solicit support of senators, congressmen and LGUs	NSF administrators, specially public facilities
Partnership with international organizations like Rotary and Lions clubs	NSF administrators, specially public facilities
Lobby for participation of local chief executives and legislative officials to compose ordinances; Include NBS in the orientation kit of local officials and continuing advocacy among LGU officials	Municipal or City Health Officers
Provide NBS for free to all Filipino newborns	Program administrators

for CAR, both of which required a long travel period and entailed significant costs for transportation, especially for Region V.

Some mothers as well as some health providers were unaware that NBS was PhilHealth covered. Thus, mothers, even when they were PhilHealth members, did not avail of the NBS package. Also, some members failed to utilize their PhilHealth coverage. They lacked knowledge of PhilHealth benefits and reimbursements. Despite the Pantawid Pamilyang Pilipino Program (4Ps), a sector of our society also remained without PhilHealth coverage so they also cannot avail NBS for free.

IEC on the PhilHealth member benefits had room for improvement. Furthermore, the politicized selection of 4Ps beneficiaries observed by our informants in some areas prevented coverage of some deserving families. Although small in numbers, there were pregnant women who were unable to avail of PhilHealth coverage since their family income level was unqualified for 4Ps coverage. At the same time, they were unqualified PhilHealth beneficiaries: women in common-law relationships; and young unmarried pregnant women beyond the age of dependency.

In response, NSRC made significant efforts that draw some parallel to the recommendations made by this research. Currently, there are 14 continuity clinics serving the long-term management needs of confirmed patients from different regions in the country. The establishment of continuity clinics further strengthened the referral and management network of all positive cases. Action plans are also in place to publish on-line training modules duly recognized by the DOH for the expanded NBS. The intention is to train health providers in NBS facilities and DOH program coordinators. Current advocacy utilizes a quad-media campaign, that is, utilizing television, radio, print, and internet. IEC taps the immense power of social media such as twitter, facebook, and other websites to reach a wider audience of household members to increase knowledge and awareness on NBS. Alliance-building includes active partnership with LGUs which resulted in the passage of local ordinances and resolutions that support NBS and the streamlining of PhilHealth processes in health facilities. Several DOH ROs have been more proactive in providing financial support to the continuity clinics and in handling their program monitoring and evaluation of NBS. As the NBS program shifts to a phase of expansion, the DOH and partner stakeholders remain aggressive in its efforts to push the numbers of screened babies upward across the nation.

Health Providers. There was a perceived lack of training among health providers especially among midwives and BHWs. Some BHWs expressed desire for knowledge of NBS detected diseases. In some areas, there was insufficient effort among health providers to explain NBS benefits to mothers and families. Those affiliated in public facilities already had a lot on their plates, thus they perceived NBS as 'just another health program'. Incentives for health providers and administrators, not only for high-performing facilities, promoting NBS may be instituted. Appointment of NBS related program coordinators and team work were recommended for their effectiveness.

Birth Facility Factors. NBS delivery to inaccessible and disadvantaged areas remained a challenge. Health providers found it hard to inform results to the families. In cases of positive screens, families were burdened on additional cost of confirmatory tests as well as transportation, accommodation and other incidental costs. In Region V, the nearest confirmatory center or NSC-NIH can only be reached through a combination of land, air, and sea routes. Aside from the difficulty in reaching geographically isolated and disadvantaged areas (GIDAs), only one regional nurse coordinator was assigned to monitor the region's 280 NSFs, almost double CAR's 151 NSFs. Coordination with NSC-NIH was also difficult, although the use of video conferencing facilities such as skype enabled the region's coordinator to participate in meetings.

Mother's Characteristics. In general, mothers and health providers were aware of NBS and its benefits. However, there was confusion on screening timetable and actions to take for positive cases, and treatment for confirmed cases. In Perth, Australia mothers were likewise aware of NBS, however, more comprehensive information of the test was desired [11].

Some mothers lacked knowledge of NBS benefits, especially those residing in GIDAs in CAR. Health providers suggested the incorporation of NBS in pre-marital education classes and barangay assemblies. Timing of provision of NBS information was a significant factor in determining mothers' ability to grasp the information [11]. Mothers-in-law can also be targeted because they greatly influenced the decision of mothers regarding NBS uptake for their grandchildren.

Some mothers lacked money to avail of NBS and there were still home deliveries. To ensure coverage, mothers paid on installment basis and social workers shelled out

money. Trust between mothers and health providers made this possible in CAR. Indigent families enrolled in PhilHealth by LGUs or through NGO-sponsored programs. Mothers who delivered at home were monitored by midwives and BHWs. They brought the baby to the nearest health facility for NBS.

Significant Others. Most mothers in both regions wanted to allow their children to be screened, assuming money was not a concern. However, a few mothers and significant others such as grandmothers and fathers of great influence to mother's decision had misconceptions about NBS. IEC efforts should not only target the mothers but their significant others as well -- the fathers, grandparents and other members of the family and the community.

Child and Delivery Factors. Some mothers still preferred home delivery due to financial reasons, convenience and trust in their traditional birth attendants (TBAs). Obligating TBAs to report deliveries within 24 hours to the local health office was recommended.

For both regions, the distance of one's residence to a health facility can influence NBS uptake. Mothers were unable to deliver in a health facility when labor sets in at night or during the wee hours of the morning. Thus, a TBA's service was sought. Unfortunately homebirths were usually unscreened. Even so, the BHWs should be able to monitor and report to the health facility. The mother should also be informed that her child should avail of NBS.

Walk-in mothers in both regions who did not have prenatal check-ups did not avail of NBS. The health provider in the community or health facility never had the opportunity to discuss NBS and its benefits with the mother-to-be and the family was unprepared for NBS cost. In these cases, mothers who are PhilHealth members may still avail of NBS for free. Health providers simply have to brief the parents about the procedure and discuss the advantages of NBS.

Despite its mountainous topography characterized by towering peaks, plateaus and intermittent patches of valleys, CAR remained the top performer with system processes promoting NBS worthy of emulation. It conducted yearly strategic planning and goal setting with increasing targets. NBS was one of the programs implemented by BEmONC and CEmONC facilities aimed at lowering neonatal deaths. The middle manager's efforts, a key to efficient monitoring and evaluation, contributed to the increased NBS coverage. Monitoring hard-to-reach areas was a priority; NBS was monitored through immunization records or a logbook. NBS monitoring was included in the monthly statistical report of the health facility. The inclusion of NBS in the licensing programs was helpful to efficient monitoring because facilities were reminded of its importance in providing quality care to mothers and their babies; they were also compelled to include NBS in their services. By monitoring the different areas, the nurse regional coordinator was able to engage 'top' support, that of Regional Director, along with 'bottom' support. There was NBS team in each health facility where members had specific tasks ensuring attainment of the goals specified in the Program's important components [7].

Reporting and tracking updated each patient's status. Transfer to another health facility or town, for instance, was duly noted. Database information was complete due to thorough gathering of essential details such as the address of the mother allowing easy contact whenever necessary. NBS screening results were communicated to both the mother and the physician via SMS. Apart from screening, follow-up was also given importance.

CAR had partners such as JICA and UNFPA to support the NBS program. The LGU structure and the current system for NBS were highly effective, as was the financial support system. Majority of the LGU-retained hospitals were actively participating in the procurement of filter cards. The DOH likewise allotted budget of PhP550 per patient for NSFs with patients who cannot afford the NBS service fee. CAR, having the highest percentage, received filter cards as incentives.

In both regions, practices of the essential components of the NBS system cited by Padilla, et al. (2009) were found – Education, Screening, Early Follow-up, Diagnosis, Management and Evaluation [7]. IECs for NBS were on-going. These advocacies targeted the health providers, mothers and the community including local government officials. NSFs offer screening services in coordination with their assigned NSC, i.e., NSC-NIH for Region V and Newborn Screening Center-Angeles University Foundation (NSC-AUF) for CAR. Abnormal test notification, tracking and confirmatory testing (referred to as the Early Follow-up component of the system) was done by the NSC in coordination with NBS coordinators at the regional, provincial, municipal/city and facility levels. For G6PD, 25 strategically located confirmatory centers were available nationwide. Evaluation of program implementation was

done on a regular basis. Diagnosis (clinical and biochemical evaluation) and Management (counselling, treatment monitoring and long-term follow-up) were conducted by referral. These components, complemented by dedicated administrators, coordinators, and health providers promoted NBS uptake in both regions.

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