

# Improving Women's and Children's Health in DPR Korea

*Mid-Term Evaluation Report  
January 2012*

*Nossal Institute for Global Health,  
University of Melbourne, Australia*

*National Institute for Public Health Administration,  
DPR Korea*

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## List of Abbreviations

ANC	Ante-natal Care
DPRK	Democratic People's Republic of Korea
EmOC	Emergency Obstetric Care
ENC	Essential Newborn Care
IEC	Information, Education and Communication
IFRC	International Federation of Red Cross
IMCI	Integrated Management of Childhood Illnesses
KAP	Knowledge, Attitudes and Practices
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MOPH	Ministry of Public Health
MMR	Maternal Mortality Ratio
MNC	Maternal and Newborn Care
MNCH	Maternal, Neonatal and Child Health
NIPHA	National Institute for Public Health Administration
ORS	Oral rehydration solution
PPH	Post Partum Haemorrhage
RH	Reproductive Health
RTI	Reproductive Tract Infection
ROK	Republic of Korea
STI	Sexually Transmitted Infection
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

## Executive Summary

The project for 'Improving the health of Women and Children' in the Democratic People's Republic of Korea aims to reduce morbidity and mortality of women and children through strengthening the national health system. It was implemented in selected parts of the country since 2006, but no baseline was conducted prior to the inception of the project. A baseline survey was designed in late 2008, during which tools to capture Project Outcome-level indicators were designed and field tested. The survey was conducted in early 2009 in sites that had not received the Project, but would do so in Phase II (from 2009). The comprehensive survey, using multi-stage cluster sampling of all regions, documented baseline conditions in facilities, and the skills and knowledge of health staff and the community. This exercise will serve as a basis for evaluating the Project at its conclusion; it also supported better targeting and strengthening of interventions in Phase II sites. The final report of the Baseline Survey was submitted in March 2009.

A mid-term evaluation was conducted in March 2011 at a mid-point in Phase II within sites that received the Project over the past two years. Its purpose was as follows:

The purpose of the mid-term evaluation was to assess the extent to which the Project had achieved its stated objectives in terms of Project inputs and outputs within the last two years, and, based on lessons learned, provide guidance for review and revision of Project strategies and activities.

The Specific Objectives were:

- (1) To determine the quality and quantity of activities (outputs) and outcomes in the previous two years, and
- (2) To provide recommendations on strategy and activities for future implementation.

Two consultants from the University of Melbourne collaborated with the National Institute of Public Health Administration (NIPHA) and the World Health Organization country office in Pyongyang, DPR Korea on both the baseline survey and mid-term evaluation. A capacity building approach was adopted, enabling NIPHA staff to learn new skills in the classroom and apply these in the field.

The mid-term evaluation – like many interim evaluations within international development assistance programmes – was not intended as a comprehensive evaluation, but as a rapid assessment progress of the Project. Its primary purpose was to produce guidance for further roll-out of the Project. The consultants made just one visit of two weeks' duration for the entire process of data gathering and analysis, which necessarily limited the range, diversity and size of the sample. Pragmatic decisions about study sites were based on whether they had received substantial Phase II activities, and were accessible by road from Pyongyang. The mid-term evaluation comprised visits to

19 facilities in seven provinces by four teams, with a total of 67 structured interviews and 21 semi-structured interviews. Obstetricians/ midwives and household doctors were randomly selected, but the numbers were small due to time constraints.

Invariably, a rapid assessment cannot achieve the rigour of systematic research, and therefore, its findings must be viewed with caution. Nevertheless, such assessments are routine, and useful for picking up indications that assist Project managers to direct subsequent efforts more appropriately. Like other rapid assessments, this mid-term evaluation captured available secondary data to help compensate for the short field work, thus making the report more relevant for Project partners.

Principal data (and sources) of the evaluations were: activities undertaken (review of Project reports); 'snapshot' assessment (using modified baseline survey tools) of the condition and resources of a small sample of facilities and knowledge of small samples of health providers; and qualitative research (using new semi-structured guides) with various informants to gain deeper understanding of events and situations that may have influenced progress. Results were analysed by the consultants and NIPHA staff using Epi Info and Statistical Package for Social Sciences, SPSS (quantitative data) and thematically (qualitative data). Activity reports were assessed to determine both progress and gaps.

This report summarizes findings organized according to Project Outcomes; which are discussed in terms of implications for the mid-term evaluation objectives within each sub-section. A Conclusion section summarizes lessons learned and their implications for further roll-out of the Project, as well as its final evaluation.

### ***Findings***

The Project system of cascade training had been used broadly across sites. Master trainers at the central level trained trainers at the provincial level, for staff at county level and in some cases ri level training. Materials appeared to be appropriate and adult-learning mechanisms, including role plays and problem-based-learning were in place. Not all providers at each site had been trained, however, and the rigour of training and opportunities to consolidate new learning through practice and observation could be guaranteed at lower levels under the cascade system. Some training materials were also said to be in short supply.

Supervision from upper levels had increased according to those interviewed, with more focus than previously on observation, review of patient records and technical feedback according to the expected knowledge and skills through Project training. Interviews suggested effective integration of training follow-up and refreshing of skills and the supervision system. However, although some staff commented that training had become more technically-focused, it must be emphasized that the quality of supervisory practices could not be assessed during this evaluation.

While the sample of obstetricians and midwives was small, the trend towards better knowledge should give some satisfaction to the Project team. Obstetricians also expressed greater confidence in their ability to diagnose and manage normal and



complicated deliveries, as well as prevent post-abortion infections. Their access to upgraded facilities, new equipment and a broader range of supplies and drugs were cited (along with training) as critical to their greater confidence and competence. The small increases reported in utilization data for normal vaginal deliveries at ri, and for both normal and complicated deliveries at the county level, suggested changing practices among mothers (who also reported this shift) congruent with Project objectives.

Household doctor knowledge was generally good in relation to critical child symptoms and appropriate use of antibiotics, but there was room for improvement. Doctors reported that their ability to diagnose and appropriately treat patients had improved due to training in IMCI and better access to IMCI equipment, consumables and drugs. Doctors at ri and county level also reported that better diagnosis and treatment at ri level resulted in better referral of complicated or severe cases; however, this was anecdotal. Household doctors had reasonable knowledge of breastfeeding, but were not sufficiently aware of the recommended two year duration and promotion of frequent feeding to boost breastmilk supply. As with other sample groups, some doctors advised parents to offer less food than usual to sick children, which is potentially dangerous. Doctors interviewed at ri and county levels emphasized the need for a continued focus on skills development in detecting and referring at-risk pregnancies.

Field visits gave the research team the impression that women were positive about the care received at ri level, and (though not aware of the Project itself), noticed some changes in terms of rehabilitation of facilities, equipment, drugs, capacity of staff and frequency of community education activities. In the facilities covered in the Mid-Term Evaluation, data on service utilization, referrals and normal deliveries shows care being sought and delivered more closely in line with Project objectives. Health service utilization data appears to be routinely collected at facilities and offers a relatively robust way to monitor Project trends and progress.

Upgradation and equipment of key hospital departments has led to significant changes in doctors' medical practice, quality of care and ability to perform lifesaving measures, flowing to a reported positive change in referral practices. The quality of a few specific equipment items procured through the Project was poor or inappropriate, specifically, ultrasound machines, surgical instruments, blood pressure monitors and ambulances.

The delay in the refurbishment of facilities and distribution of equipment and consumables to facilities originally targeted in the 2009 plan had a serious impact on Project implementation. Therefore, there will be time pressures to effectively deliver the complete phase II package in the remaining Project period. Laboratory and blood services at facility level remain poor and should also be a priority in the remaining period.

Overall, the mid-term evaluation found evidence of improved trends in terms of supplies of consumables and medicines, and knowledge of health providers. Stock-outs were much lower than found at baseline, but still widespread. The delays in procurement, and the lack of a standard policy of replenishing supplies over time, had

potentially serious implications for the capacity of providers in the Project sites to deliver improved maternal, neonatal and child care.

### ***Recommendations***

There were signs of uneven roll out of the programme in terms of the integration of physical upgrading and training packages due to a number of factors: 1) the delays in implementing the facilities upgrading component; 2) decisions to upgrade different target departments across different facilities i.e. laboratories upgraded in different facilities to operating theatres and delivery rooms; and 3) the lack of overlap at times between national training plans and facilities targeted for upgrading.

- (1) The Project team should now consolidate implementation plans with the aim to achieve a concentration of Project inputs in targeted facilities.

The following recommendations, organized by topic or sample, are for consideration in relation to further roll-out of the Project.

### ***Training***

- (2) The upgrading and support through the Project to training centres at central and provincial levels had been critical to raising training quality and maintaining a strong system. Ideally, staff from both county and ri levels would receive the training at the better equipped provincial level.
- (3) Additional training materials should be provided to ensure the availability of sufficient quantities and range of materials at all levels.

### ***Health providers' knowledge***

- (4) The Project should continue to emphasize training and supervision to ensure all health providers consolidate critical knowledge areas. While some items were more often incorrectly answered than others, it could not be ascertained whether this was a general weakness across the entire Project. However, it is advisable to give additional attention to those items, including those relating to MCH danger signs and effective techniques to increase breast milk supply.

### ***Equipment***

- (5) A review of technical specifications may be needed for ultrasound machines, surgical instruments and ambulances to ensure Project quality and appropriateness. Consideration should be given to convert the fuel systems of current ambulances.
- (6) Reliable ambulances at county level to collect women and neonates from communities to avert deaths and near-misses are a priority. It may also be advisable to emphasize the need for systems established in every community

to ensure each pregnant woman has backup in place for transportation if the need arises, especially because this cannot be predicted.

- (7) Ri facilities would value bicycles to better serve the dispersed communities they now must reach on foot in all weathers.
- (8) Laboratory and blood services at facility level remain poor and should be a priority in the remaining period.

### ***Consumables and Medicine Supplies***

- (9) The Project may wish to prioritize consumable replenishing channels, including for household doctor kits, [if possible six-monthly] during the next period to make it easier for lower level facilities to implement IMCI and manage both normal and complicated deliveries, as well as neonatal complications. Otherwise, many cases will continue to need referrals, a practice that could endanger women's and children's lives if not available in a timely fashion.
- (10) Replenishment of medicines is essential to avert mortality and morbidity, and to achieve Project objectives. It is a priority for the future of this Project.

### ***Community involvement***

- (11) In terms of delivery patterns, service utilization data are an easy way to monitor this critical trend. Where patterns become undesirable in terms of Project objectives, qualitative research may assist in understanding changes.
- (12) The evaluation did not get the opportunity to assess the specific range of community health messages in the IEC programme targeting household doctors, but these should be appropriate and well targeted messages focused on priority health areas in the context of local health data.

### ***Considerations for the final evaluation***

- (13) For the endline, additional qualitative data will be essential to illuminate the quantitative findings, particularly to enable managers to grasp why and where the Project has succeeded or encountered difficulties. This will assist in conceptualizing and planning follow-on Projects.
- (14) Benchmarking provides a rough snapshot of "capacity" at baseline across each sample group. While its use for the mid-term evaluation is limited, it can be used at endline assuming a representative sample has been achieved. At that point, it will be necessary to undertake specific comparisons of mean and median (range), as well as proportional change within sample groups at each level (i.e., low, medium and high capacity). This means that full data sets from the baseline survey should be retained for this purpose.
- (15) All tools should be carefully reviewed for the endline evaluation. It was clear that some items in the audits were either dropped from the original plan, or

not held in the specific site within facilities that was expected at the time of the baseline. Clearer instructions are required on the audit instruments.

- (16) Analysis of ri and county obstetricians should be undertaken separately which will require re-analysis of baseline data as well as endline.
- (17) It is suspected that high baseline results were partly due to it being undertaken in areas where training had already occurred. It may be useful to re-analyse baseline data based on regions where no training had occurred prior to baseline to provide a clear comparison with endline.
- (18) The Project team should consider whether staggering the endline evaluation would be more appropriate with immediate outcomes such as changes in knowledge and physical capacity being undertaken early and utilization indicators being evaluated after a suitable period.
- (19) It is not recommended that either maternal or infant/child mortality be used to draw conclusions about the impact of the Project because of the difficulty of attribution (other projects occurring simultaneously) and confounding (natural disasters or other events negatively affecting health).
- (20) For the final evaluation, appropriate time should be allocated to working with the local evaluation team, as one day's preparation in the mid-term evaluation was not sufficient to ensure shared understanding of use of tools.



## 1. Background

The project for Improving the Health of Women and Children in the Democratic People's Republic of Korea was implemented in selected parts of the country since 2006. The Project's *Principal Objective* was to reduce morbidity and mortality of women and children in DPR Korea through strengthening the national health system. The Project Outcomes include the following:

- (1) Improved technical and human resource capacity to deliver basic health care;
- (2) Augmentation of physical capacity of health facilities to deliver quality maternal, newborn and child health services;
- (3) Enhancement capacity of health managers for planning, implementation, supervision and management of the health information system, and
- (4) Heightened degree of involvement of individuals, families and communities in improving the health of women & children.

No baseline survey was conducted prior to the Project's inception. An external evaluation was conducted in May 2008 and a revised proposal for Phase II was agreed. It was also agreed that a baseline survey should be undertaken prior to the extension phase to enable final evaluation of the Project. The Nossal Institute for Global Health at the University of Melbourne provided short-term consultancies via the World Health Organization (WHO) in DPR Korea in recent years. Two consultants from the Nossal Institute were engaged to support the National Institute of Public Health Administration (NIPHA) to develop and implement the baseline survey under guidance from the Ministry of Public Health (MoPH). They made two visits to DPR Korea to develop the survey tools and analyse the data.

The survey was conducted in early 2009 in sites that had not received the Project, but would do so in Phase II (from 2009). The survey documented baseline conditions in facilities, and the skills and knowledge of health staff and the community in providing a basis for evaluating the Project, as well as to assist in targeting and strengthening of interventions in the Phase II sites. The baseline survey report was finalized in a report submitted in March 2009.

A mid-term evaluation was requested by the donor and WHO, and the same Nossal consultants developed a study design based on a framework drafted in 2010 by WHO. The consultants worked in DPR Korea during 11 - 25 March 2011 alongside NIPHA and MoPH. This evaluation was conducted at a mid-point in Phase II within sites that received the upgrading, equipment and supplies of the Project over the past two years.

## **2. Mid-Term Evaluation Methods**

### **2.1 Survey Aim and Objectives**

The WHO framework articulated the following purpose, focus questions and objectives for the mid-term evaluation:

The purpose of the mid-term evaluation is to assess the extent to which the Project has achieved its stated objectives in terms of Project inputs and outputs within the last two years, and, based on lessons learned, provide guidance for review and revision of Project strategies and activities.

The mid-term evaluation has the following questions:

- (1) Has the Project delivered inputs as stated in the Project proposal and plans?
- (2) Has the Project delivered outputs (and outcomes where possible to assess) as stated in Project proposal and plans?
- (3) What are the main strengths and weaknesses of programme implementation to date, and what recommendations are there for maintenance and revision of current Project strategy and activities?

The Specific Objectives were:

- (1) To determine the quality and quantity of activities (outputs) and outcomes in the previous two years, and
- (2) To provide recommendations on strategy and activities for future implementation.

The methodology adopted for achieving these objectives are outlined below.

### **2.2 Study Design**

As previously noted, a comprehensive baseline survey was completed in early 2009. The survey was a large, robust research effort; it utilized multi-stage cluster random sampling across all regions (80 facilities visited and 524 individuals surveyed with structured questionnaires). Data were gathered by several teams. The international consultants made two visits, with an interval of two months for the teams' distant travel, data cleaning and data entry. On the return visit, consultants and local partners produced descriptive data and interpreted the findings. The baseline survey design was constructed to enable a similar, comprehensive final evaluation of the impact of the Project after its conclusion.

By contrast, the Mid-Term Evaluation – like many interim evaluations conducted within international development assistance programme – was not intended as a comprehensive evaluation, but as a rapid assessment of Project progress. Its primary purpose was to produce guidance for the further roll-out of the Project. The consultants

made just one visit of two weeks' duration for the entire process of data gathering and analysis, making it impossible to replicate the geographic range and diversity, and the large random sample, of the baseline survey. For this exercise, pragmatic decisions about study sites were based on whether they had received substantial Project activities, and were accessible by road from Pyongyang. The mid-term evaluation comprised visits to 19 facilities with a total of 67 structured interviews and 21 semi-structured interviews. Invariably, a rapid assessment cannot achieve the rigour of systematic research, and therefore, its findings must be viewed with caution. Nevertheless, such assessments are routine, and useful for picking up indications that assist Project managers to direct subsequent efforts more appropriately. Like other rapid assessments, this mid-term evaluation captured available secondary data to help compensate for the short field work, thus making the report more relevant for Project partners.

The principal data (and sources) of the evaluation were: activities undertaken (review of Project reports); 'snapshot' assessment (using baseline survey tools) of the condition and resources of a small sample of facilities and knowledge of small samples of health providers; and qualitative research (using new semi-structured guides) with various informants to gain deeper understanding of events and situations that may have influenced progress.

Both baseline and mid-term evaluation employed a cross-sectional survey. Methods were selected in response to the mid-term evaluation objectives, as follows:

**Specific Objective 1** To determine the quality and quantity of activities/ outputs and outcomes in the previous two years)

***(a) Methods to determine quality***

Audits and KAP questionnaires to assess facility capacity, human resource capacity, knowledge and practices of health providers

***(b) Methods to determine quantity***

Project reports on upgrading, training etc from baseline to present

**Specific Objective 2** (Provide recommendations on strategy and activities for future implementation)

***(a) Methods to determine progress***

Analysis of results from mid-term evaluation

***(b) Methods to learn lessons for future implementation***

Qualitative in-depth interviews with all sample groups from baseline, Project managers and training providers



## 2.3 Sampling and Recruitment

### *Sampling strategy*

The main sampling unit was the *health facility*. Only facilities that received most or all of the Project activities in Phase II were meant to be included, with the additional criterion of being accessible from Pyongyang. A screening question on Project training was used to construct lists of obstetricians/midwives and household doctors for whom randomization was possible.

In addition, interviews were held with central level training sites for IMCI and maternal-neonatal health, and one at the Nursing School in S. Pyongyang province.

Four teams were mobilized from NIPHA, with the consultants accompanying two teams. Altogether, the four teams visited seven provinces (See map below).

A total of 19 facilities were visited by four teams, with a similar sampling approach in each. The total quantitative sample totalled 67 (see details in Table 1), including:

- Nineteen audits and Director questionnaires from three provincial hospitals (two maternity and one paediatric), four county hospitals, twelve ri hospitals/clinics;
- Twenty-four obstetricians/midwives (half each at county and ri); and
- Twenty-four household doctors at ri facilities.

Table 1. *Quantitative Sample*

Sample (Method)	Team 1 (Morrow)	Team 2 (Booth)	Team 3	Team 4	Total
Provincial paediatric hospital (Audit-Interview)		1			1
Provincial maternity hospital (Audit-Interview)		1	1		2
County hospital (Audit-Interview)		3	1		4
County obstetricians (KAP)		9	3		12
Ri clinics/ hospitals (Audit-Interview)	4	2	3	3	12
Ri obstetrician/ midwives (KAP)	4	2	3	3	12
Ri household doctor (KAP)	8	4	6	6	24
<b>Total</b>	<b>16</b>	<b>22</b>	<b>17</b>	<b>12</b>	<b>67</b>

The qualitative (in-depth interview) sample totalled twenty one, including:

- Three at national level (master training programme for IMCI and maternal and neonatal health, plus a nursing school);
- Two at provincial level (directors of maternity and paediatric hospitals);
- Four county hospital directors;
- One county obstetrician;
- Two ri facility directors;
- Three ri obstetricians/midwives;
- Three household doctors (ri); and
- Three mothers (ri level).

## 2.4 Ethics

Ethical aspects of research were discussed during the first visit, covering issues of confidentiality, potential harm or distress, voluntariness of participation and informed consent. As for the baseline, individuals approached for interviews were told the purpose of the research and what was required of them; they were assured that they may refuse to participate without adverse consequences, and that their names and responses would not be cited in the report in a way that enables their identification. (Facilities and participants for the quantitative sample are only identifiable by the questionnaire code).

## 2.5 Data Collection Tools and Process

Both exercises utilized the same quantitative tools used for the baseline survey in 2009, namely facility audits and Director questionnaires, as well as Knowledge, Attitude and Practices (KAP) questionnaires for health providers and mothers. These tools were developed in consultation with NIPHA, MoPH and WHO-DPR Korea during the first visit of the consultant. The contents of the tools was based on:

- Project objectives and outputs
- Project logframe
- M&E indicators devised at time of external evaluation (May 2008).

Questions within tools were drawn where possible from existing, tested instruments focusing on MNCH used nationally and/or internationally; others were devised using evidence of effective approaches in international peer-reviewed literature. These various sources are outlined in the footnote<sup>1</sup>. It should be noted that most questions were open-

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<sup>1</sup> *Lancet* series on: Countdown to 2015 [MDGs] (2006-2008), maternal health (2006), child health (2003), neonatal health (2005), undernutrition (2008).

ended; however, lists of likely responses were constructed to allow interviewers to save time by circling, rather than writing, each answer. Importantly, these lists varied in that some included only correct responses, while others included correct and incorrect. Most allowed an "other" or "I don't know" response as well (Please see Annex 1 for copies of Data collection tools).

In addition, the mid-term evaluation used new, semi-structured question guides for in-depth interviews. These focused on the experience and perception of Project activities and systems, covering these areas: supervision, training, distribution and use of equipment and supplies, outcomes, lessons learned and perceived change. The guides were developed by the consultants to undertake in-depth (individual) interviews with Project managers, providers and recipients of training, health facility managers, health providers and mothers. (Please see Annex for copies of guides)

Secondary data (Project reports) were collated to determine the approximate number and range of training activities, refurbishment and supply of equipment, consumables and drugs. This exercise assisted the consultants in identifying progress and gaps. Reasons for uneven distribution of supplies were explored during in-depth interviews.

The mid-term evaluation team comprised approximately 25 NIPHA staff, most of whom had participated in the baseline survey. The Director of NIPHA assigned them roles and responsibilities. Each sub-team had a supervisor who took responsibility for the integrity of the data through daily reviews. Data collection was completed in 3-4 days, depending on the team.

## 2.6 Data Collection, Management and Analysis

### *Data entry and analysis*

EpiInfo field names in both Korean and English were prepared during the first visit. Data were entered by NIPHA specialists; all data entry was double-checked by the responsible sub-team. Data were analysed using the statistical packages Epi Info 3.5 and SPSS.

Descriptive statistics and frequency tables constituted the bulk of data analysis. These data were further reviewed to determine quality standards (or "benchmarks") for

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Awasthi S, Verma T & Agarwal M. 2006. Danger signs of neonatal illnesses: perceptions of caregivers and health workers in northern India. *Bulletin of the World Health Organization*, 84(10):819-826.

DPRK 2004 National Nutrition Assessment questionnaire.

WHO IMCI MCE (Multi-Country Evaluation). 2001. Household Survey. [http://www.who.int/imci-mce/Methods/Household\\_survey.htm](http://www.who.int/imci-mce/Methods/Household_survey.htm)

WHO Department of Child and Adolescent Health and Development. Family and Community Health Cluster. 2003. *Health Facility Survey (IMCI)*. WHO: Geneva.

WHO 2003 *Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors*. <http://www.who.int/reproductive-health/impac/>

Syed U, Asiruddin Sk, Helal Md SI, Mannan II & Murray J. 2006. Immediate and early postnatal care for mothers and newborns in rural Bangladesh. *The Journal of Health, Population and Nutrition*. ICDDR, B, 24(4):508-18.

individual questions and for topic areas in order to provide a meaningful overview of findings for Project managers and for the final evaluation. Benchmarks are described in more detail within individual sections.

Qualitative analysis was undertaken thematically by the consultants, with reference to the mid-term evaluation purpose and specific objectives. Results were used primarily to corroborate, explain or query quantitative results, and to contribute depth and detail to our understanding of "lessons learned".

## 2.7 Limitations

### *Study design*

While tools do include questions on MNC mortality, post-operative infection rates and health service utilisation, the baseline survey was aimed primarily at the outcome rather than impact level.

For the mid-term evaluation, as noted above, limitations are substantially greater. It is crucial to note that, unlike the baseline survey, ***it was not intended that the mid-term evaluation would obtain a representative sample*** from which generalizations and conclusions could be drawn, and robust comparisons made, as is apparent from the description of Sampling (2.3). In addition, despite efforts to include only facilities that had received all Project activities and whose staff had all been trained, it emerged that those selected differed in terms of content and reach of the Project, and elapse of time since activities commenced. Hence, it was difficult to ascertain the apparent impact of the holistic Project model in a given setting. Thus, findings from primary data collected (ie, audits, surveys and interviews) should be considered with caution in this light. It is not legitimate to make quantitative comparisons between the data collected at baseline and mid-term. However, the mixed method approached used at mid-term offers a measure of triangulation; this means that where all data sets are in agreement, there is more reason to place confidence in findings. All data sets will be presented and their implications discussed within these limitations.

## 3. Findings

### 3.1 Outcome 1. Technical and Human Resource Capacity to Deliver Basic Health Care

The project aimed to improve the knowledge and skills of health providers at all levels to enable them to take up evidence-based approaches to maternal, neonatal and child health, particularly emergency obstetric and newborn care (EmOC) (basic at ri and comprehensive at county levels), and IMCI (Integrated Management of Childhood Illness). Key activities undertaken included the development of clinical materials, training, practice and supervision.

This section reports on:

- training and guidelines;
- quality assurance and supervision;
- knowledge and reported practices of obstetricians and household doctors; and
- utilisation of health services.

### ***Training***

Training activities and outcomes are reported, particularly for EmOC and IMCI, which are key foci of the Project. Other clinical training delivered under the Project as well as training in supervision, referrals and health information systems is discussed in later sections of this report. Full details of Phase II training can be found at **Annex 2**.

#### ***Training of Trainer (TOT) model***

Training is based on a cascade training of trainer (TOT) model. Master trainers study the pedagogy of TOT, along with optimal methods to deliver effective technical training. Master trainers then train provincial staff as trainers, and expose them to methods including role plays, use of mannequins, powerpoint presentations and demonstration DVDs. Provincial level trainees then organize direct training (not TOT) for the county/district level who, in turn, train at ri level. Occasionally, depending on special need, the province will train at ri level, but this is not the norm. Trainers from each level also conduct supervision and monitoring during and after training. Observation of practice according to indicators set within the training programme is used to ensure consolidation of skills, and identify gaps.

#### ***EmOC Training***

Pyongyang Maternity Hospital is a central level facility that coordinates training in maternal and neonatal care under the Project. Its system is basically cascade training, with the apex comprising the hospital's master trainers. These people work in groups (4-5 people each) focused on specific topics, such as EmOC, safe abortion, etc. Most master trainers have studied overseas and are highly qualified clinicians. The programme is coordinated and supervised by MoPH. TOT materials were developed by the master trainers themselves. Materials for technical training were provided by WHO consultants and obtained through WHO and overseas study tours by master trainers. These are subsequently modified to render them appropriate in DPR Korea.

During Phase 2 (2009-2010), training for obstetricians on basic and comprehensive emergency obstetric care and safe abortion continued to be rolled out using the cascade TOT training model in three provinces. Over 1 000 obstetricians participated in this training: 35 at central level; 174 participants at provincial level; 583 participants at county level; and 311 participants at ri level. The training period was between five and 18 days.

## **IMCI Training**

IMCI was introduced as a national programme in DPR Korea in 2004 and trialled in two provinces in 2005 (two counties in each). On the basis of this experience, IMCI was expanded to a further 30 counties in 2006 and introduced to 27 new counties each year from that time on. By 2010, IMCI had been established in 114 counties across eight provinces with a total of 98 in-service training activities and 3 576 participants. A similar roll-out was implemented through pre-service training for nurses, doctors and midwife students at medical universities, nursing and midwifery schools. IMCI training materials were produced and distributed from central to ri level. While, the main target for IMCI is household doctors, further guidelines for emergencies and management of severe cases were implemented at province and county levels. Evaluations were conducted through initial health assessments prior to training and follow up assessments some time after training to evaluate training effectiveness.

During Phase 2 (2009-2010), IMCI in-service training was rolled out in four more provinces involving 380 paediatric staff as trainers from central, provincial and county facilities. A total of 790 household doctors were trained. Pre-service training for 468 medical students was also undertaken at the four provincial medical universities. A new Household Doctor training package, a comprehensive MCH guide of 14 modules (incorporating IMCI), has also been developed and trialled in North and South Hwanghae provinces. Additional training for nearly 2500 household doctors on select MCH topics was also instigated by the MOPH.

## **Training Outcomes**

A significant TOT training programme was rolled out nationally for IMCI and obstetric care. During in-depth interviews at facilities visited for the mid-term evaluation both household doctors and obstetricians were very positive about the training and new materials received and were able to describe how training had provided them with new skills and knowledge and improvements in their practice. See **Sections 3.1.3** and **3.1.4** for changes in knowledge and practices of obstetricians and household doctors respectively.

## **Guidelines**

The audit conducted at sample health facilities in the mid-term evaluation found an improvement in the presence of key guidelines in facilities compared with the baseline. At ri clinics/ hospitals new EmOC materials (2008) were found in most facilities. IMCI materials were found in every facility. At county hospitals, there were increases in guidelines found at facilities but not universally. Generally, the provincial level was well equipped with guidelines.

For both EmOC and IMCI there was a lack of the full range of required training materials for distribution. Guidelines may be available at facilities but not for individual staff members. For example, there was a lack of IMCI protocols flip chart for household

doctors. Specialist training materials were also not available at lower levels. The IMCI training CD for household doctors was not available at ri level. For EmOC, it appeared materials at provincial level were adequate, except for the management of RTIs. There was also a great shortage of mannequins of mothers and infants, which were critical practice aids. Projectors for presentations were also insufficient in number.

### ***Opportunities to practise***

Combining practice and theory is central to the success of these training programmes. However, the ability to practise could be reduced at the lower levels due to lack of equipment, trainer capacity, and/or cases. For example, it is particularly difficult to train about management of post-partum haemorrhage and partography using mannequins. Hence, CDs and DVDs developed at central level would be very beneficial as aids to enhance learning.

### ***Cascade training***

The cascade training model is highly useful to achieve wide coverage and to align with the clinical supervision system. However, the evaluation found that not all staff in a particular health facility had attended the training. Obviously, staged implementation is inevitable, but training plans need to include a strategy for staff not yet trained. The mid-term evaluation found that the cascade system, as it applies at local levels, sometimes had ri staff (or the Director), who had been trained at county level, going on to train their staff and peers, raising concerns about training quality for these staff.

MOPH report that ultimately pre-service training is easier to manage and more cost-effective than in-service training, but recognize that training of the current health workforce is also paramount.

### ***Discussion***

A significant amount of training had been achieved in both IMCI and EmOC through the programme. Master training centres were highly professional with clear systems for the overall management of training programmes. Significant training materials/guidelines had been produced and were found in most of the facilities visited. However, number of materials was limited per facility and all materials were not available. The cascade training model is necessary, but there is a risk that quality standards are not maintained at lower levels, given that those trained at the county are not trained to become trainers, and also because the ri hospital does not provide the range of practice opportunities that exist in larger facilities to apply and consolidate new skills.

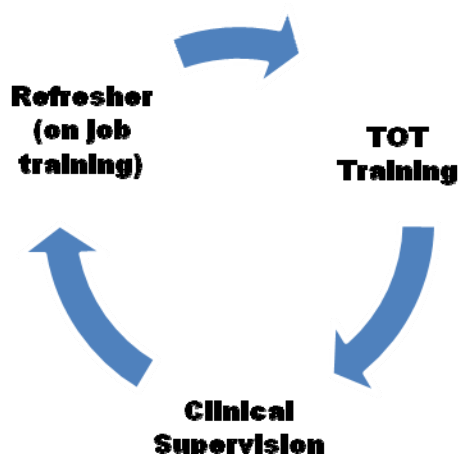
The upgrading and support through the Project to training centres at central and provincial levels are critical to raising general quality and maintain a strong system. Ideally, staff from both county and ri levels would receive the training at better equipped provincial training centres.

### **Quality assurance and supervision**

During Phase II, training in supervision, monitoring and support was implemented by the MOPH from central to ri level. Training in supportive supervision was conducted from between 2 and 6 days for a total of 36 participants at central level, 215 participants at provincial level, 132 participants at county hospital level, and 90 participants from ri facilities. Training in field monitoring for central MOPH Project staff was also implemented. A three-day training in referral and follow up mechanisms was conducted for a total of 162 participated from central to ri level. Details of Phase II training can be found at **Annex 2**.

The overall integration of the system for training and supervision, which reportedly facilitates refresher skills updating and corrective action, is quite robust and provides a solid basis for monitoring training effectiveness and priorities. See **Figure 1**.

**Figure 1:** Training and supervision cycle

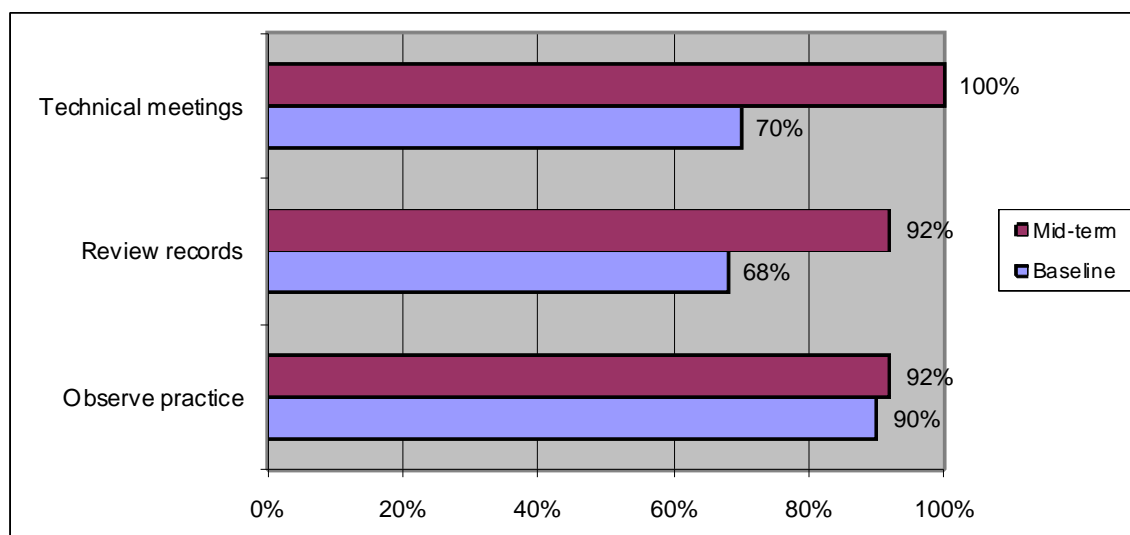


### **Outcomes**

A questionnaire administered with health facility directors as part of the audit found that clinical supervision practices in facilities at all levels were fairly consistent. Clinical supervision involved observation of clinical practice, review of patient records, and technical staff meetings. Almost all facilities at ri, county and provincial levels reported holding regular technical meetings with staff at least once a week. The most noticeable change in comparison to the baseline survey was the increases in technical meetings and review of patient records at ri level (see **Figure 2**).



**Figure 2:** Elements of clinical supervision in Ri facilities at baseline and mid-term



Clinical supervision from the level above was reportedly conducted at least quarterly, though many facilities reported more regular visits. Most facilities reported that these visits entailed the observation of clinical practice. Only around half of facilities reported that supervisors from the level above checked patient records. All facilities at county and provincial levels reported that technical meetings were held with supervisors from the level above, but only half of ri clinics. Uneven access to transport is clearly a major concern for supervisors, particularly when aiming to visit large numbers of facilities at lower levels.

### **Discussion**

Clinical supervision is institutionalized at all levels and the range of supervision methods has expanded at the lower levels. Supervision visits from the upper level reportedly occurred at least quarterly in accordance with MOPH protocols, though lack of transport posed a significant barrier. Interviews with staff suggest effective integration of training follow-up and refreshing of skills and the supervision system. However, it must be emphasized that the quality of supervision practices was not able to be assessed during this evaluation.

### **Knowledge and reported practices of obstetricians**

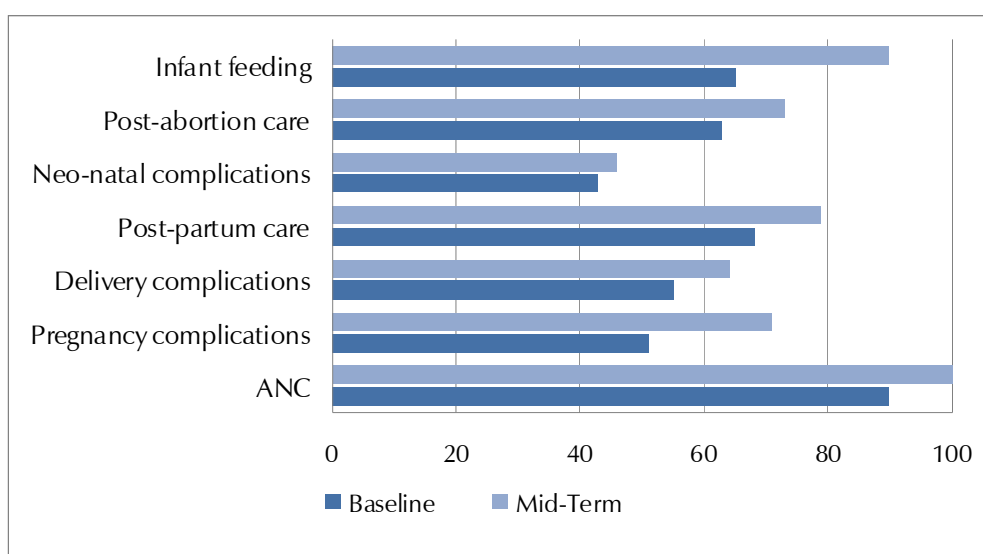
Introducing evidence-based training packages for basic and comprehensive obstetric and newborn care is a key Project strategy. Given the harsh climatic and economic conditions, and barriers such as lack of transport, improving the health of women means improving

access to quality health services close to where people live; therefore, the Project focus is on county and ri levels.<sup>2</sup>

This section summarizes knowledge levels at baseline and mid-term evaluation of health personnel responsible for obstetric and newborn care at target health facility levels. Obstetricians/midwives<sup>3</sup> (n=84 baseline; n=24) at ri (n=60 baseline; n=12 mid-term) and county hospitals (n=24 baseline; n=12 mid-term) were interviewed using a KAP questionnaire, which assessed knowledge of pregnancy, delivery (including neonatal care) and post-abortion care, as well as infant feeding. The mid-term sample had a younger median age (35.5 years vs 40 at baseline), but a shorter median working period at the facility (7.5 years vs 10 at baseline). In-depth interviews were held with three obstetricians/midwives.

An overall score for each topic area was calculated by averaging scores on individual questions for the sample group. Overall, knowledge as summarized in topic scores was better in the mid-term sample than at baseline, but there continued to be some areas of relative weakness (see **Figure 3**).

**Figure 3:** Knowledge of obstetricians by topic at baseline (n=84) and mid-term (n=24)



### **Pregnancy care knowledge**

Obstetricians were asked in an open question what should be included in a standard ante-natal care (ANC) visit. Responses were recorded against a list of 10 possible correct

<sup>2</sup> WHO Improving Women's and Children's health in Democratic Republic of Korea – Framework for 3-year Assistance 2008-2010. Proposal submitted to the Government of ROK September 2007

<sup>3</sup> At ri level, KAPs were conducted with the midwife if she was responsible for pregnancy and delivery care.

practices. At baseline, over 80% mentioned at least 6 practices; at mid-term 75% mentioned 10. Practices mentioned least often differed; checking the foetal heartbeat was lowest at baseline (62%, vs. 79% at mid-term), whereas giving advice on iron supplementation was cited by 63% at mid-term (vs. 74% at baseline), and checking for anaemia cited by 71% at mid-term (vs. 89% at baseline).

Small improvements from very high baseline levels (rising from about 90% to 100%) were found in relation to the purpose of checking blood pressure and oedema, while a larger improvement was found in knowledge of the two best drugs for management of pre-eclampsia (51% at baseline, vs. 71% at mid-term).

### ***Delivery care knowledge***

Obstetricians were asked about management of delivery complications and maternal post-partum and neonatal danger signs. Knowledge on management of post-partum haemorrhage (PPH), the primary direct cause of maternal death in DPR Korea, was assessed by a scenario and query on management steps plus five related short questions. There was no change in the proportion (67%) able to name 5 of the 6 correct steps, but results were better at mid-term on several items, eg check for tears, start IV and begin bi-manual compression (all 91% or greater). The five questions were scored as 'fully' or 'partly' correct. The mid-term sample showed much better knowledge on four items. However, the mid-term average (64%) in meeting benchmarks on these items leaves some room for improvement.

Nearly 80% at mid-term (vs. 68% at baseline) knew at least 5 (of 6) post-partum danger signs, but 38% did not mention severe headache/blurred vision (vs. 73% at baseline).

In terms of neonatal complications, benchmarks at mid-term remained at 46%, just marginally better than 43% at baseline. Weakest knowledge of signs was for lethargy, hypothermia, convulsions and low birth weight.

### ***Knowledge of post-abortion care***

The National Reproductive Health Strategy (2006-2010) of the DPR Korea includes the prevention and treatment of abortion-related complications as a priority area. Obstetricians were asked about symptoms of post-abortion sepsis, an important contributor to maternal mortality and morbidity. Average benchmark results were the same, relatively high level as at baseline (75%), but knowledge was lower at mid-term for cervical motion tenderness (33% mid-term vs. 39% baseline), prolonged bleeding (50% vs. 66% at baseline), tender uterus (63% vs. 75% at baseline) and malaise (33% vs. 80% at baseline). While only half correctly answered that antibiotics and then manual vacuum aspiration were appropriate for post-abortion sepsis at baseline, 71% knew this at mid-term.

### **Knowledge of optimal breastfeeding practices**

The benchmark on infant feeding rose proportionally more than any other item (from 65% to 90%). Evidence shows that early and exclusive breastfeeding for six months can avert 55-87% of all-cause neonatal mortality or morbidity<sup>4</sup> Obstetricians were asked about optimal breastfeeding practices in terms of current international and national recommendations. At mid-term, 100% knew breastfeeding should be initiated within the first hour of delivery (vs. 69% at baseline) and all knew that six months' exclusive breastfeeding is optimal (vs. 63%). When asked how mothers could increase breast milk supply, 71% (vs. 75% at baseline) correctly cited frequent feeding, but (as at baseline) the other responses (which are largely or totally ineffective) were mentioned by most.

### **In-depth interview results**

Neither the baseline nor mid-term surveys directly assessed provider skills. The ability to effectively treat patients requires not only knowledge and skills, but also institutional support, and physical capacity, as reflected in the Project design. During interviews, obstetricians emphasized their sense of greater confidence in managing the following:

- Partograph
- Eclampsia
- Neonatal resuscitation
- Post-partum haemorrhage
- Visual inspection of the cervix (cancer screening)
- Reproductive tract Infections
- Preventing post-abortion infection.

One county obstetrician commented,

*"Before we had equipment, we had problems providing treatment and had to refer patients to upper levels. But now that our hospital has been rehabilitated and we got trained, we can do treatment here. This has led to a reduction in maternal deaths".*

One ri-level obstetrician said she still had to persuade some women to follow advice:

*"Some women think they can have a normal delivery and there is no need to get check ups. So when we go to the community, we explain that a healthy mother will have a healthy baby, and a healthy pregnancy needs to be monitored by the health staff. And some don't want to use antibiotics during pregnancy. Staff tell*

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<sup>4</sup> Darmstadt GL, Bhutta ZA, Cousens S, et al, for the Lancet Neonatal Survival Steering Team. 2005. Evidence-based, cost-effective interventions: how many newborn babies can we save? *Lancet* (365 ):977-88.

*women that it isn't good unless there is an infection; in that case, antibiotics are good for both baby and mother".*

Obstetricians noted their satisfaction with training and a greater benefit from supervision. It was apparent that those interviewed actively work to educate women and provide care at the facility and at home (for ri level), with some even going to workplaces. However, the fact that some mentioned examining pregnant women a total of 17 times suggests that they are exceeding the recommended number of ANC visits.

Obstetricians also noted greater involvement of the local government in emergency transport for pregnant women, although this was not always the case. There was concern expressed in several sites visited about the absence of ambulances or their unreliability, and the stock-out or limited supply of drugs such as oxytocins and drugs to treat RTIs.

### ***Discussion***

While the mid-term sample cannot be said to be representative, the trends towards better knowledge and confidence expressed by obstetricians and midwives should give some satisfaction to the WCH Project team.

In terms of the application of findings from the mid-term, areas of relatively lower knowledge may be seen as providing pointers for the monitoring, supervision and training teams.

Obstetricians interviewed expressed greater confidence in their ability to diagnose and manage normal and complicated delivery, as well as prevent post-abortion infections. Their access to upgraded facilities, new equipment and a broader range of supplies and drugs were cited as critical to their greater confidence and competence. The small increases reported in utilization data for normal vaginal deliveries at ri, and for both normal and complicated deliveries at county level are evidence of changing practices among mothers (who also reported increased births at these levels and decreases in births at provincial level) (see **section 3.1.5**), and congruent with WCH Project objectives.

While it is pleasing to note that some ri's have greater involvement of local government in providing emergency transport for women, it may be advisable to emphasize the need for systems established in every community to ensure each pregnant woman has back-up in place for transportation if the need arises, especially because it cannot be predicted.

### ***Knowledge and reported practices of household doctors***

Household doctors play a pivotal role in providing primary health care, preventive services and health promotion knowledge. The Project has aimed to incorporate IMCI into household doctor practice and improve pregnancy and post-partum care. Household doctors (n=180 baseline; n=24 mid-term) at ri clinics and hospitals were interviewed using a KAP survey which assessed management of childhood illness, infant feeding and pregnancy care. In-depth interviews were also held with household doctors to further

explore their knowledge, practices and perspectives. The median age of household doctors was 36 years compared to 33 years at baseline and they had worked a similar median duration at the facility (8 years vs 7 year at baseline).

### **Management of Childhood Illness**

Household doctors reported changes in their ability to better diagnose and treat illnesses based on the IMCI training as demonstrated in this response,

*“Before, if a child presented, all I knew was that they were sick and used injectable antibiotics. Now I use real diagnosis and can treat the specific disease and multiple conditions”.*

Surveyed doctors demonstrated good knowledge about recognizing critical child illness. During both baseline and mid-term evaluation, three-quarters of doctors were able to name at least five symptoms requiring urgent care-seeking. A much higher proportion of doctors in the mid-term evaluation (83% compared to 47%) mentioned fast breathing, an important danger sign of respiratory illness. Knowledge of feeding practices when children are sick rated poorer than the baseline with one-fifth of doctors recommending that a sick child should be offered less food than usual, a potentially dangerous practice, whereas no one mentioned this in the baseline. Further discussion would be needed to understand the reason for this apparent inconsistency with baseline.

One favourable finding in this sample was an indication of improvement in the appropriate use of antibiotics. For example, in response to a given scenario, around 40% of household doctors suggested the prescription of antibiotics for treatment of uncomplicated diarrhoea, compared with over 90% during the baseline. Knowledge of ORS remained high. Household doctors reported that in the past they treated diarrhoea with fasting and ‘medicines’, but now know the merits of ORS and breastfeeding. As one doctor reported,

*“I had one case this year with a child with diarrhoea several times a day. He was 14 months and very uncomfortable because he couldn't sleep well and he didn't want to eat. In that case, I gave him ORS and zinc tablets and let him take more ORS at home so he could recover”.*

Appropriate use of antibiotics was apparent in another scenario question to household doctors about the treatment of severe measles, whereby 71% recommended injectable and 50% oral antibiotics for five days. However, ORS was suggested by one-third, though it is not indicated as the child was feeding and did not have diarrhoea. Importantly, a high proportion of the sample recommended continued breastfeeding, though only half recommended foods and other fluids.

One doctor advised that protocol does not allow administration of IV fluid to babies at Ri level, but the rationale for this needs follow up.

### ***Knowledge of optimal infant feeding practices***

Foods recommended for an 8-month infant were generally deemed nutritious and appropriate. Almost all household doctors (96% during baseline and mid-term) thought that all or nearly all women breastfed. Knowledge of infant feeding is relatively good with all doctors surveyed knowing that breastfeeding should be initiated within the first hour and around 90% knowing the recommended period of exclusive breastfeeding. However, half the doctors did not report that breastfeeding duration optimally should continue for two years. There was also incomplete knowledge that frequent feeding can boost breast milk supply (less than 60% mentioned this during the mid-term evaluation). Most household doctors (like obstetricians and mothers) also cited mechanisms, such as eating specific foods that have little or no impact on milk supply. These findings are pointers for further emphasis during the remainder of the Project.

### ***Pregnancy care knowledge***

To evaluate their knowledge of pregnancy care, surveyed household doctors were given a short scenario about the best drugs to manage a woman presenting with symptoms of pre-eclampsia. Most doctors (96%) were able to name both drugs, compared to only half (49%) of doctors in the baseline assessment.

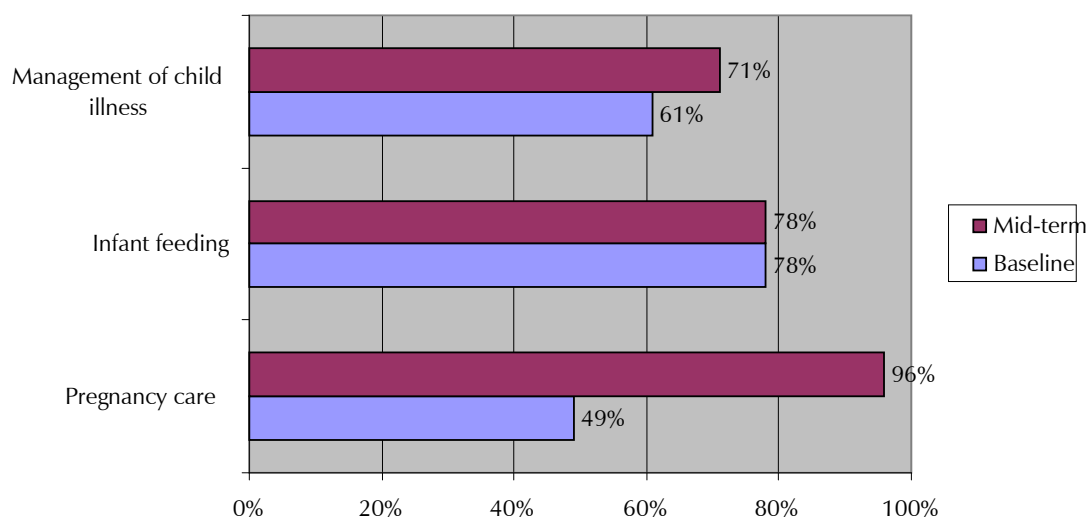
In qualitative interviews, some doctors mentioned their ability to better detect complications and at-risk pregnancies and refer them to the higher level. County doctors interviewed also reported improvements in ri capacity to recognize danger signs and appropriately refer cases to the county hospital.

*“The ri level is now better at detecting abnormal delivery cases and referring to county level. This prevents some of the pregnancy complications”.*

It was also mentioned at county level that correct referral from ri is still a priority for further training.

An overall score for each topic area was calculated by averaging scores on individual questions for the sample group. Overall, knowledge as summarized in scores was better in the mid-term sample than at baseline. (see **Figure 4**).

**Figure 4:** Household doctor knowledge benchmarks between baseline and mid-term evaluation



Household doctors reported that they were applying their new skills in IMCI and new medical equipment to save lives.

*“There are many cases where I’ve saved lives. For example, this year there was a case of fast breathing in a 10 month old infant with a temp of 38.5, and difficulty in feeding. So I used the bag [household doctor kit provided through the Project] to measure temperature and give paracetamol and antibiotics”.*

Some claimed that the IMCI and new equipment had led to reduced morbidity, reduced referrals and increased health service utilization. Our data showed a doubling of outpatients at ri level during the index month, but the small number of facilities in this sample should be noted (see **section 3.1.5**). Some claimed that death rates had declined in the past year, though this was anecdotal and not confirmed by other data.

### **Community engagement**

Household doctors had direct and frequent contact with the community at grassroots level, and evidence shows that close partnerships between communities and local health staff can contribute significantly to maternal, neonatal and child health.<sup>5</sup> One challenge is the sheer size of some ris, and reaching distant settlements on foot in all weather. Doctors reported undertaking health promotion in the community and in the health facility, as one described:

<sup>5</sup> *Reducing Maternal, Newborn and Child Deaths in the Asia Pacific: Strategies that Work*. 2008. World Vision Australia and Nossal Institute for Public Health, Univ of Melbourne. <http://www.worldvision.com.au/learn/policyandreports/files/StrategiesThatWork.pdf>



*"I do gather the people together to give health education once a week. In the hospital once a day – as a group and individually. Today was the day to examine pregnant women, so I told them how to take care of themselves in pregnancy. I told them to drink enough water and eat protein foods, and to prevent eclampsia by not taking too much salt, and if they have a headache, to come to the hospital. When I last went to the community, on Monday, I told them how to prevent colds and bronchitis, and traditional methods to prevent bronchitis".*

Another described,

*"I do health education three times a month in the community. I gather them into a room in a meeting room in the house of the head of community. The content depends on the season and disease trends, for example, SARS and infectious diseases, or how to prevent child diarrhoea. I also give them lots of information, like to eat more natural foods like sweet potato, and to take salt gargle to prevent colds, and not to smoke. When they come here, I give them information according to individual need and talk about healthy foods".*

The quotes above highlight the risk if health messages are shared which are not based on evidence, such as gargling salt to prevent colds or preventing eclampsia by not taking too much salt.

### **Discussion**

Household doctor knowledge was generally good in relation to critical child symptoms, and appropriate use of antibiotics. Doctors reported that their ability to diagnose and appropriately treat patients had improved due to training in IMCI. Doctors at ri and county level also reported that better diagnosis and treatment at ri level resulted in better referral of complicated or severe cases; however, this is anecdotal and not corroborated by other data.

Findings indicating knowledge areas requiring further attention are: (1) ongoing emphasis on appropriate use of antibiotics; (2) messages that offering less food than usual to sick children could be highly dangerous; (3) improved breastfeeding advice on recommended two year duration and promotion of frequent feeding, rather than consumption of specific foods, to boost breast milk supply; and (4) continued focus on detecting and referring at-risk pregnancies.

The evaluation did not assess the range of health messages in the IEC programme targeting household doctors, but these should be focused on appropriate and well targeted health messages in priority health areas.

### **Health services utilization**

The appropriate use and satisfactory patient outcomes at facility level are universal goals for all health systems. In the case of DPR Korea, special focus is on the rational use of resources, challenges for delivering care – and achieving referrals – in remote settings, and reducing maternal, neonatal and child morbidity and mortality. These focal areas are reflected in training of providers, refurbishment of facilities, use of health records for planning, and education of communities about where and why to seek treatment at particular facilities. Information on these areas was gathered at baseline and in the mid-term evaluation. In this sub-section, we report on all levels of care surveyed. While data were also collected on deaths, these cannot be extrapolated.

### **Care-seeking, referrals and normal vaginal deliveries**

Outpatient numbers were higher than baseline at ri level, and slightly lower at county and provincial levels. Similarly, referrals from the level below were lower at both county and provincial paediatric hospital (only one in mid-term). Normal vaginal deliveries were higher at mid-term than baseline at both ri (in particular) and country (slightly), and dropped modestly at provincial level (see **Table 2**). This trend appears in another form in a comparison of median rates of delivery at each level and practices reported by mothers at baseline (see **Figure 5**).

**Figure 5:** Comparison on place of delivery according to health records data (median) and reports by mothers in KAP survey at Baseline

<b>Normal vaginal delivery</b>	<b>Baseline</b>	<b>Mid-term</b>
Ri hospital		
Health records data (median)	26	39
Reported by mothers (%)	47%	
County hospital		
Health records data (median)	279	291
Reported by mothers (%)	17%	
Provincial maternity hospital		
Health records data (median)	1652	1610
Reported by mothers (%)	29%	
At home with health worker		
Reported by mothers (%)	7%	

Table 2. **Outpatients, referrals and normal vaginal births by facility**

Health Information Category	Ri Clinic/ Hospital		County Hospital		Provincial Paediatric Hospital		Provincial Maternity Hospital	
	Baseline (n=60)	Mid-term	Baseline (n=)	Mid-term	Baseline (n=)	Mid-term	Baseline (n=)	Mid-term
Outpatients – 1 mth	419 (152-2833)	893 (334-2312)	18631 (8242-28761)	17936 (13244-29143)	8801 (2285-9161)	8318	8214 (2150-9505)	9255 (9035-9475)
Inpatients – 1 mth	-	-	302 (192-592)	260 (235-497)	318 (197-351)	308	656 (198-861)	840 (784-895)
Outpatients child < 5 – 1 mth	56 (17-340)	127 (52-389)	892 (519-1528)	913 (687-1486)	6179 (1576-6871)	5408	-	-
Referrals from level below child < 5 – 1 mth	-	-	848 (483-1497)	828 (613-1342)	6062 (1545-6802)	4934	-	-
Normal vaginal deliveries – 12 mths	26 (0-67)	39 (0-66)	279 (163-408)	291 (235-437)	-	-	1652 (485-1740)	1610 (1593-1626)

### Discussion

While not representative of the entire Project area, data on service utilization, referrals and normal deliveries at mid-term show care being sought and delivered more closely in line with Project objectives. Health service utilization data appears to be routinely collected at facilities and offers a relatively robust way to monitor Project trends and progress. If trends are reversed at any time, it would be advisable to undertake selective in-depth interviews at facilities with providers and the community to investigate the reasons. Indeed, if the supply of consumables and drugs remains unpredictable, this could have a strong negative impact on utilization trends, influencing the community to seek care at higher levels.

### 3.2 Outcome 2. Physical Capacity of Health Facilities to Deliver Quality Maternal, Newborn and Child Health Services

The refurbishment of facilities and provision of equipment, consumables and drugs is a major component of the Project and a key strategy to improving the quality of maternal, neonatal and child health care.

The baseline survey sampled a total of 80 health facilities: 60 ri clinics; 12 county hospitals; and 4 paediatric and 4 maternity provincial hospitals. At mid-term, 19 facilities were sampled, including 12 ri clinics/hospitals, 4 county hospitals, 2 provincial maternity and 1 provincial paediatric hospital. At both points, audits were undertaken, which

collected information on health facility characteristics and physical capacity to deliver quality maternal and child health services. Physical capacity was assessed on the availability and condition of buildings and equipment, as well as consumable and medicine supplies at different health facility levels.<sup>6</sup> Lists of essential standard items provided through the Project for the different levels were developed. The research teams were required to specifically observe items and assess their working order and general condition.

### ***Equipment and supplies distributed in Phase II***

By the end of Phase I, a total of **8** provincial hospitals, **60** county hospitals, and **400** ri facilities had been refurbished and equipped. Other upgrading was undertaken for provincial blood centres etc.

Phase II involved the ongoing procurement and distribution of building refurbishment, equipment and supplies to provincial, county and ri facilities in new Project areas (see **Table 3**).

*Table 3: Equipment and supplies distributed in Phase II*

<b>Rehabilitation</b>	<b>Ri clinics/ hospitals</b>	<b>County hospitals</b>	<b>Provincial hospitals</b>
Building refurbishment	400	20*	4
Standard Equipment	400	20	4*
Emergency room		30	30
Laboratory		10	
Blood services		20	7**
Ambulances		30	5

\* Standard equipment at county and provincial levels is for operating theatre and delivery room, and ICU in provincial paediatric hospitals.

\*\* supplies only, no rehabilitation

The roll out was the subject of significant funding and procurement delays; hence, equipment and supplies planned for facilities targeted in the 2008 year were only distributed by November 2009. The planned upgrading of new targeted facilities in 2009 had not yet commenced at the time of writing. However, building materials and consumable items had been received in DPR Korea and equipment was being awaited before facility distribution commenced.

<sup>6</sup> Audits were undertaken as follows: ri level - general equipment needs for primary level, including delivery room and midwifery kits; County level - operating theatre, delivery room and laboratory and blood transfusion services; provincial paediatric - operating theatre and intensive care unit; provincial maternity - operating theatre and delivery room.

The Project implementation plan proposed a gradual county-wide roll out of facility upgrading with identified targeted facilities in new Project areas. However, the desire to support improvements across the country led to some disbursement of support to facilities. For example, emergency room or laboratory upgrading might not have been undertaken in the same facilities that received upgrading of operating theatres and delivery rooms. While the rationale for this approach is understandable, it presents some complexity for evaluating impact of improvements across all dimensions of the targeted services.

### ***Equipment and upgrading***

All facilities visited at mid-term had received rehabilitation, except for one of the provincial maternity hospitals scheduled to receive assistance in 2009 and still awaiting the new equipment for operating theatre and delivery room. Specific information on building upgrading was not collected, but all facilities appeared to have been renovated and facilities were generally clean and well maintained. Due to power shortages and interruptions, facilities were largely unheated, which is not conducive to patient wellbeing. Heaters had been installed through Project support in delivery rooms and operating theatres, significantly improving temperature conditions. Generators had been provided to assist with regular power supply and this was observed as a crucial component of the assistance, given that many facilities did not appear to be accessing the regular power supply, presumably due to power shortages. Thus, maintaining fuel supplies for generators is paramount for the use of new equipment and provision of quality care.

On the whole, equipment had arrived in one consignment at the time expected (taking into account Project implementation delays). County and provincial facilities reported that staff and technicians were trained in specialist equipment operation and maintenance prior to the arrival of the equipment.

County and provincial facilities reported that new equipment and upgrading of delivery rooms and operating theatres had allowed doctors to work under favourable conditions. Doctors were able to diagnose patients more rapidly and generally improve their care. Practising on new equipment allowed them to better utilize their skills and manage cases themselves without having to refer to higher levels. Staff observed that their facilities were better utilized, as the population became aware of the upgrading of facilities and new equipment. For example, counties reported that more women came to county level for their delivery (although only a slight increase was observed in the utilization data obtained from the facilities visited). Facilities reported a reduction in post-operative infections and complications and a reduction in facility deaths. One county hospital obstetrician reported:

*“Before the equipment, there was a problem with our treatment. We needed to refer most patients to the upper level. Now our facility is rehabilitated we are able to do treatment here and we received training, so we can properly diagnose and treat. We now have a reduction in maternal deaths”.*

At ri level, Directors and staff noted positive changes. For example, they emphasized the greater capacity of household doctors to diagnose and treat women and children, using thermometers, specimen containers, otoscopes and surgical supplies. Obstetricians can better examine women and handle obstetric and neonatal emergencies with IVs, mucus extractor, and midwifery kits. These supplies had enabled them to reduce upward referrals.

Quality concerns were raised about some equipment items purchased through the Project, specifically ultrasound machines, surgical instruments, and ambulances. Ultrasound machines are apparently of poor quality, purchased in China at the less expensive end. One county facility had been waiting six months for the return of an ultrasound machine which had to be sent to Pyongyang for repair after being in the facility for less than two years. Facilities reported that surgical instruments had started to deteriorate and signs of rust on some instruments were directly observed during the evaluation. The supplied ambulances have a fuel system which is inappropriate, as the type of fuel required is difficult to procure locally. This has led to some facilities rationing the use of the ambulance. However, in one county, the Health Bureau had funded the successful conversion of the fuel system, which could be explored for all new ambulances. Many facilities emphasized the lifesaving importance of having the ambulance in rural areas.

The issuing of standard sets of equipment is necessary in a complex Project; however, it is apparent that there are different needs in different contexts. One hospital reported that the three sets of surgical instruments provided cannot meet the need, as they encounter high rates of injuries requiring surgery due to their proximity to factories.

It was noted that only some household doctors had received kits, and their contents had not been regularly replaced when consumed. They said IVs were sometimes lacking (and they are not allowed to use the type they have on infants at ri level), as well as laryngoscopes, thermometers and blood pressure monitors (especially for children). In particular, ri facilities would value bicycles to better serve the dispersed communities they now must reach on foot in all weathers.

### ***Upgrading of laboratories and blood services***

Laboratories and blood services departments were visited in four county hospitals. All laboratories had a microscope in good condition. However, lack of reagent and other consumables had impeded the effective use of the microscope. Not all laboratories had yet been rehabilitated in the sample sites visited, indicative of the uneven roll out of the rehabilitation across facilities. In these facilities, centrifuges, pipettes, incubators and refrigeration were either in poor condition or not available. This indicates the priority for upgrading laboratories not yet reached by the Project. The need for improving diagnostic capacity in these sites were emphasized by interviewed staff.

The upgrading of Provincial Blood Centres was appreciated and utilised by facilities visited. Provincial and county staff mentioned that some blood supplies were received through the upgraded provincial blood centre, making it easier to access blood for

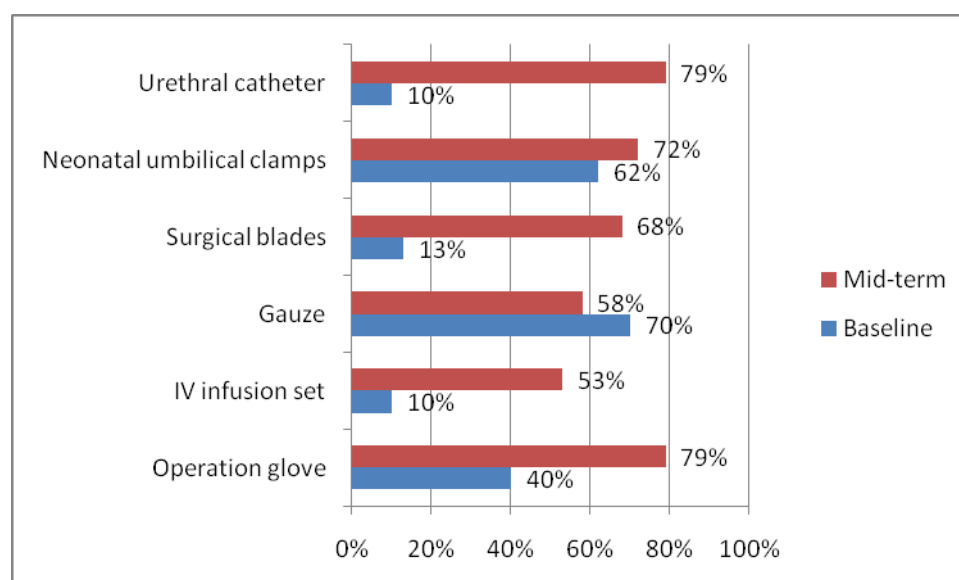
emergency cases. However, most supplies ordered through the Project for blood transfusion at facility level have not yet been received, affecting hospital capacity.

### Consumables

Consumables were audited in all sampled facilities at baseline and mid-term. At provincial level facilities, almost all consumables were available at the time of the visit and very little stock-out was reported. Stock-out was defined as out of stock for three consecutive days over the previous three months. Most items were also available at county hospitals, through much higher levels of stock-out were reported, with around 50% of facilities visited reporting stock-out of most consumable items. At ri level, a larger number of items were not available in some of the ri clinics/ hospitals and many items were vulnerable to stock-out.

This insufficiency was corroborated during in-depth interviews, in which shortages of items such as IV kits, surgical blades, examination gloves and bandages were interfering with the capacity to deliver good quality care. Some facilities were growing cotton themselves in order to maintain a constant supply of swabs. Though facilities continue to report that consumables are insufficient and unevenly replaced, there is a reduction in the number of items affected by stock-out at all levels when compared with the baseline (see **Figure 6**). It may be noted that the sample size is too small to provide a representative comparison with baseline, but shows a trend towards improvements in consumables in most areas.

**Figure 6:** Percentage of facilities reporting no stock out of select consumables at baseline and mid-term



Note: The denominator is different where an item is not included on consumable list at the facility level.

## Essential medicines

The evaluation found that a reasonably high proportion of essential medicines were observed in the facilities at the time of the visit. However, facilities at ri, county and provincial levels all reported significant levels of stock-out of essential medicines.

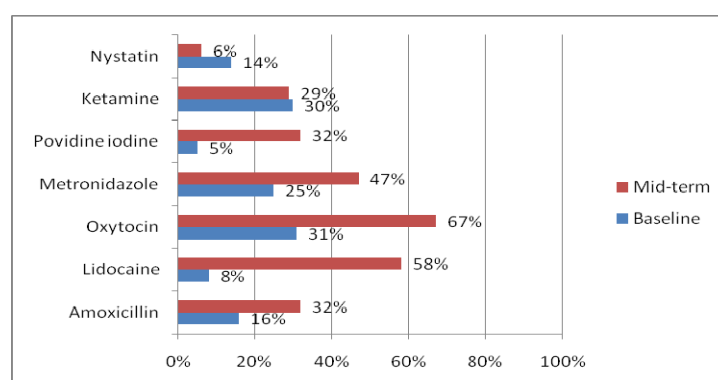
Essential medicines that were reported to not stock out included iron/folic, paracetamol, saline (IV solution), ORS, and hydralazine. However, high levels of stock out were reported of other medicines such as antibiotics. While supplies of local anaesthetic drugs were fairly reliable at county and provincial levels, there was reported stock out at ri facilities. High stock-out of general anaesthesia drugs was reported at both county and provincial facilities. **Figure 7** compares level of stock-out of select medicines at all facilities. **Note:** The sample size is too small to provide a representative comparison with baseline, but shows a trend towards improvements in stocks of essential medicines in most cases.

During in-depth interviews at ri facilities, staff presented the favourable results of better drug supplies, while also noting shortfalls interfering with their capacity to deliver quality care. Having access to ORS and antibiotics had enabled them to properly manage the common causes of child morbidity and mortality, but the frequent lack of essential drugs such as antibiotics severely constrains their capacity to deliver quality care. This doctor commented on improvements in access to medicines,

*“Essential medicines and IMCI can treat children successfully in terms of malnutrition, diarrhoea and pneumonia, so infant deaths in the facility have been reduced. Last year we only had one infant death”.*

Traditional medicines are being grown at most facilities. While provision of complementary medicines is part of the medical system in DPR Korea, it is a matter of concern if these medicines are being used in cases where essential medicines would normally be administered but are not available.

**Figure 7:** Percentage of facilities reporting no stock out of select essential medicines at baseline and mid-term



Note: The denominator is different where an item is not included on essential medicine list at the facility level.



## **Discussion**

Upgradation and equipment of key hospital departments has led to significant changes in doctors' medical practice, quality of care and ability to perform lifesaving measures, flowing to a reported positive change in referral practices. As a result hospital staff reported a change in utilization and a reduction in complications and deaths.

The delay in the refurbishment of facilities and distribution of equipment and consumables to facilities originally targeted in the 2009 plan has had a serious impact on Project implementation, and there will be time pressures to effectively deliver the complete phase II package in the remaining Project period. Laboratory and blood services at facility level remain poor and should also be a priority in the remaining period.

The quality of ultrasound machines and surgical instruments and type of ambulances being procured through the Project should be reviewed to ensure that equipment provided is long lasting.

While the availability of consumables and medicines had improved compared with the baseline, it is of concern that availability of consumables – including some essential items for infection control and critical procedures – was still unreliable at mid-term at the limited number of facilities visited. Interviews with the Project management team indicated that this problem is widespread and largely attributable to the fact that there is no capacity to replenish stocks through the Project period. The government of DPR Korea had, to some extent, compensated for shortfalls, but had not been able to overcome these deficiencies. Regularity of supplies is extremely important to ensure Project objectives are met.

Reliable supplies of essential medicines across all facilities and stockout is still a major concern, particularly at ri level. The critical role of access to drugs, such as antibiotics, in reducing MNC morbidity and mortality cannot be over-estimated.<sup>7,8</sup> It is critical for Project outcomes that drug supplies are provided regularly and replenished in a timely fashion. The lack of reliable stocks of medicines may influence provider behaviour, who may elect to avoid using a recommended drug for fear of stockout, or opt for a second-choice drug in the absence of the one recommended. It is understood that medicine provision is a cooperative programme between the Project (via WHO), UNICEF and IFRC. As medicines are consumable items, the Project should ascertain the factors influencing likely changes in supplies at endline, given the importance of medicine supplies for ongoing sustainability of Project outcomes.

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<sup>7</sup> WHO/UNICEF. 2006. Regional Child Survival Strategy. WHO, Geneva.

<sup>8</sup> WHO 2003 *Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors*.  
<http://www.who.int/reproductive-health/impac/>

### **3.3 Outcome 3. Capacity of Health Managers for Planning, Implementation, Supervision and Management of the Health Information System at all levels**

This outcome area has focused on establishment of a Health Management Information System (HMIS) intended to improve management, planning and quality assurance of health services.

#### ***HMIS training and planning***

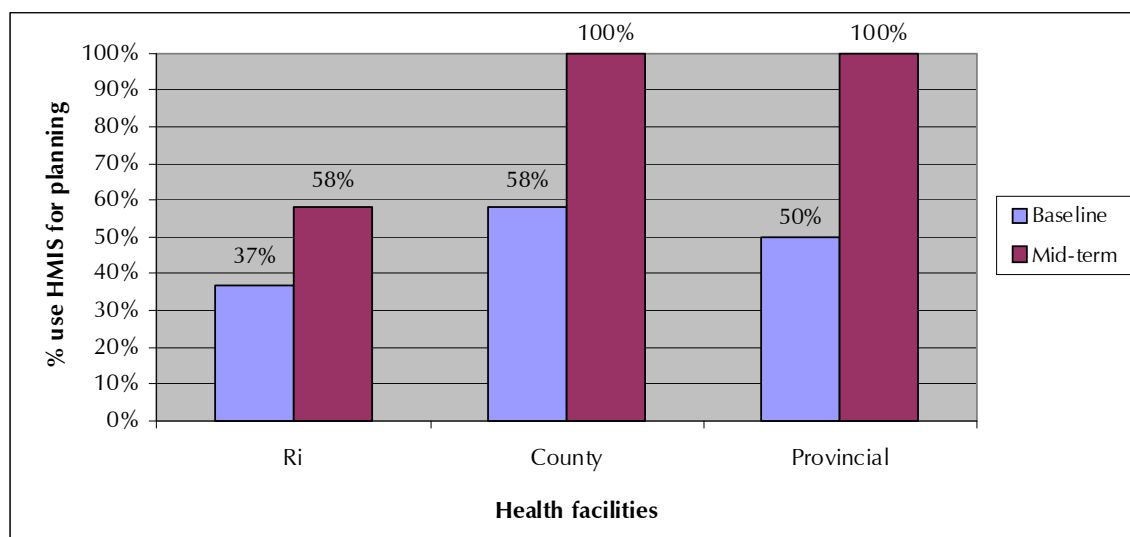
During Phase II, a five-day training course on processing, analysis and use of HMIS data was conducted at provinces for a total of 300 health facility and health bureau staff: 30 staff from central level; 250 from provincial level; and 20 from county level. Thirty computers for HMIS data processing were procured and distributed to facilities. Five new health information indicators have been introduced for outcome reporting: number of operations; post-operative complications; post-operative infections; post-operative deaths; and foetal deaths.

An HMIS Strategic Framework 2011-2015 has been developed by the MOPH in collaboration with the UN agencies. It includes a plan for electronic reporting through the establishment of an intranet system using Epi Info software and some training has been conducted for provincial and county levels on the use of this software.

#### ***Outcomes***

Computers were in place in facilities visited, but until the intranet system is developed, facilities print out current forms and complete by hand and submit manually to the health bureau. All facilities consistently reported that health information reports are submitted monthly and any deaths occurring in facilities are reported immediately. Health facility directors reported an increase in the use of health information to inform planning for service delivery. **Figure 8** below shows the comparison between baseline and mid-term for facilities at ri, county and provincial levels. There was, however, a decrease in the number of health directors who reported using health information to report specific health problems (eg. disease outbreaks).

**Figure 8:** Changes in use of health information for planning service delivery at health facilities (corroborated in some IDIs)



### Discussion

There are positive signs that there is increased use of health information for facility planning. Still, this component is at an early stage of implementation and should significantly progress with the development of a new HMIS strategic framework. This evaluation collected limited information on HMIS development and it is understood that a separate assessment is being undertaken by the Project's international HMIS Adviser.

### 3.4 Outcome 4. Degree of Involvement of Individuals, Families and Communities in Improving the Health of Women and Children

The project has identified as an objective the increased involvement of the community in maternal and child health. Compelling international evidence exists on the significant role that communities can play in promoting child health and averting morbidity and mortality.<sup>9</sup>

The Project strategy for increasing community involvement is a health education programme, including IEC materials delivered by household doctors, who work at grassroots level, undertake home visits, and have frequent interactions with households in their catchment area. As noted above, the Project hopes to see increased utilization of the first level of care, the ri, and of county hospitals for comprehensive emergency obstetric and neonatal care.

<sup>9</sup> WHO/UNICEF 2006. Regional Child Survival Strategy: Accelerated and Sustained Action Towards MDG 4. WHO, Geneva.

During the mid-term evaluation, there was insufficient time to gather a usefully large sample of mothers, given the small number of local facilities visited (and the need to restrict the sample to those with infants aged 12-24 months). We did, however, conduct three semi-structured interviews with mothers, and present a few of their responses in this section simply as reminders of issues flagged for attention at baseline.

### ***Pregnancy Care and Infant Feeding***

The women interviewed had noticed (approvingly) some changes in terms of rehabilitation of facilities, equipment, drugs, capacity of staff and frequency of community education activities. It was clear that they saw their local facility as being able to offer a good standard of care for many health needs, including delivery at local level where available.

The high number of ANC visits in DPR Korea (12 or more) reported by nearly all women at baseline was recorded, along with the fact that this frequency exceeds international recommendations. One woman from a ri that has only a clinic, not a hospital, said she had received 16 or 17 home visits during her pregnancy, and that the midwife even visited her at her place of work. It was clear from this interview, however, that these visits were used to inform and prepare the mother as thoroughly as possible for signs of labour and appropriate action in this more remote setting, where time is of the essence for safe delivery.

*“The obstetrician advised me to rest and sleep more during pregnancy, and to eat protein foods and those rich in vitamins and calcium. We deliver at the city hospital. We know our expected delivery date, so if we have pain and signs of delivery we should let the RI staff know immediately. If all is well, usually we are accompanied by the RI midwife and go to the hospital a week before the due date. Here we travel by foot to the hospital, and I went three days early with the midwife. I stayed one week in hospital after delivery. (Mother of infant aged 18 months)”*

During in-depth interviews, all three mothers said that eating specific foods was the best way to boost breast milk supply, and two mothers said sweets (cakes, chocolate) were healthy foods for young children.

### ***Discussion***

The baseline data painted a clear picture of the close link between household doctors and the community, which remains an excellent vehicle for transmitting information and basic care. The health records data suggesting more use of local facilities for care and delivery is a hopeful sign about the Project's achievements, but any change will be more definitive at the final evaluation.

In terms of child health, the baseline finding that many women (and health providers) believed that consumption of specific foods is efficacious in boosting breast

milk supply was not tested at mid-term among mothers. The fact that it persisted in the small sample of health providers at mid-term is a reminder that this unscientific belief should be addressed among the community and providers alike. Similarly, as in the baseline, some women (and providers) met at mid-term did not understand the need for ill children to be offered more food than usual. These are important knowledge areas that should receive emphasis in the remainder of the Project. It is important that IEC messages are clear, unambiguous, evidence-based, and reviewed in light of changing environments and health patterns.

## **4. Conclusions and Recommendations**

The Improving the Health of Women and Children (WCH) Project has been implemented in selected parts of the country since 2006 with the principal goal to reduce morbidity and mortality of women and children in DPR Korea through strengthening the national health system.

In DPR Korea, the Maternal Mortality Ratio (MMR) has fluctuated since 1993, increasing from 54 per 100 000 live births in 1993 to 103 in 2000, and declining to 85.1 in 2008. The recent MoPH report on MMR (which compares figures in target vs. non-target areas of the WCH Project) attributes deaths to inadequate maternal knowledge, lack of skills of providers (especially at ri and county levels) and – especially at county level – lack of resources. The major direct causes in 2008 were post-partum haemorrhage, sepsis/infection and pregnancy-induced hypertension/eclampsia, which are potentially treatable or preventable. Nearly half of maternal deaths occur in women who deliver at home. Deaths during and after abortion comprised 10.9% of maternal deaths. The report noted MMR in Project target areas was 80.9, vs. 89.4 on non-target areas.<sup>10</sup>

Essential Obstetric Care (EOC) has emerged as a key strategy for reducing maternal mortality, and health facilities equipped with skilled personnel, necessary equipment and supplies and emergency transportation systems are an essential part of this strategy.<sup>11</sup> Ensuring a continuum of care through the presence of qualified health professionals throughout pregnancy, delivery, and intrapartum, with appropriate referral to adequately staffed and equipped facilities to manage emergencies, is a critical element.<sup>12</sup>

In DPR Korea, IMCI was introduced by WHO and UNICEF in 2004. Its main objective is to reduce childhood mortality and morbidity associated with the major causes of illness. The IMCI strategy provides a set of clinical guidelines for management of childhood illness at first level health facilities to improve case management and family and

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<sup>10</sup> Ministry of Public Health, DPRK, Maternal Mortality for 2008 in areas supported by WHO under the 2006-2007 MCH Project Report, 18 Jan 2011.

<sup>11</sup> WHO/Pan American Health Organisation. 36th Session of the Subcommittee on Planning and Programming of the Executive Committee SPP36/8, Rev. 1 (Eng.), 5 March 2002

<sup>12</sup> UNICEF, State of the World's Children 2009 Maternal and Newborn Health December 2008

community health practices.<sup>13</sup> Household doctors play a pivotal role in providing primary health care, preventive services and health promotion knowledge in DPR Korea.

Inadequate infant and child nutrition is thought to account for 35% of child mortality; these deaths can be averted if women initiate breastfeeding immediately after birth, exclusively breastfeed for six months, introduce nutritious complementary foods from 6 months and continue breastfeeding for around two years (assuming the availability of sufficient nutritional food).<sup>14</sup> Community knowledge of childhood illness and symptoms requiring urgent care, together with adequate hygiene and sanitation, are critical for successful illness prevention and timely treatment.

This Project is introducing evidence-based standards for maternal and child health care, particularly the introduction of IMCI and EmOC, through a systems wide approach: training of health professionals, ensuring facilities are equipped to meet care standards and changes to current clinical practices, and encouraging the involvement of the community to help build their confidence in health services and influence care-seeking at different levels. These integrated strategies are noticeably improving skills, capacity and standards of care in target facilities.

### **Recommendations**

There are signs of uneven roll out of the programme in terms of the integration of physical upgrading and training packages due to a number of factors: (1) the delays in implementing the facilities upgrading component; (2) decisions to upgrade different target departments across different facilities, eg laboratories upgraded in different facilities from operating theatres and delivery rooms; and (3) the lack of overlap at times between national training plans and facilities targeted for upgrading.

- (1) The Project team should now consolidate implementation plans with the aim to achieve a concentration of Project inputs in targeted facilities.

The following recommendations, organized by topic or sample, are for consideration in relation to further roll-out of the Project. These are presented tentatively in light of the limitations of the Mid-Term Evaluation study design.

### **Training**

- (2) The upgrading and support through the Project to training centres at central and provincial levels have been critical to raising training quality and maintaining a strong system. Ideally, staff from both county and ri levels would receive the training at the better equipped provincial level.

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<sup>13</sup> WHO, Dept of child adolescent health and development <http://www.icatt-training.org/IMCI/AboutIMCI>

<sup>14</sup> Black R et al 2008. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet* (371) pp243-260.

- (3) Additional training materials should be provided to ensure sufficient quantities and range of materials is available at all levels.

### ***Health providers' knowledge***

- (4) It must be ensured that sufficient time is given to instruct and repeat information on key knowledge areas, and to ensure supervision focuses on the areas outlined below:

For obstetricians/ midwives:

- ANC care – checking for anaemia and providing advice on iron supplementation, and the optimal number of ANC visits;
- Delivery complications – reasons why 2 IVs are needed;
- Post-partum care – severe headache/blurred vision as symptom;
- Signs of neonatal complications – hypothermia, convulsions, low birth weight;
- Symptoms of post-abortion sepsis – cervical motion tenderness, prolonged bleeding, tender uterus and malaise;
- Infant feeding practices – there is no scientific evidence that eating specific foods (eg, pig's foot) can boost breast milk supply.

For household doctors:

- Antibiotics - continued emphasis on appropriate use;
- Feeding during child illness episodes – understanding that offering less food than usual to sick children could be highly dangerous;
- Infant feeding - improved breastfeeding advice on recommended two year duration and promotion of frequent feeding to boost breast milk supply and
- Pregnancy danger signs - continued focus on detection and correct referral.

### ***Equipment***

- (5) A review of technical specifications may be needed for ultrasound machines, surgical instruments and ambulances to ensure Project quality and appropriateness. Consideration should be given to convert the fuel systems of current ambulances.
- (6) Reliable ambulances at county level to collect women and neonates from communities to avert deaths and near-misses are a priority. It may also be advisable to emphasize the need to establish systems in every community to ensure each pregnant woman has back-up in place for transportation if the need arises, especially because this cannot be predicted.

- (7) Ri facilities would value bicycles to better serve the dispersed communities they now must reach on foot in all weathers.
- (8) Laboratory and blood services at facility level remain poor and should be a priority in the remaining period.

### ***Consumables and Medicine Supplies***

- (9) The Project may wish to prioritise consumable replenishing channels, including for household doctor kits (if possible six monthly) during the next period to make it easier for lower level facilities to implement IMCI and manage both normal and complicated deliveries, as well as neonatal complications. Otherwise, many cases will continue to need referrals, a practice that could endanger women's and children's lives if not available in a timely fashion.
- (10) Replenishment of medicines is essential to avert mortality and morbidity, and to achieve Project objectives. It is a priority for the future of this Project.

### ***Community involvement***

- (11) In terms of delivery patterns, service utilization data are an easy way to monitor this critical trend. Where patterns become undesirable in terms of Project objectives, qualitative research may assist in understanding changes.
- (12) It should be ensured that attention is paid to knowledge areas that were found to be relatively weak at baseline during the remainder of the Project, including those transmitted by household doctors in these areas:
  - Danger signs in pregnancy – trouble with vision, changes in foetal movement and severe headache;
  - Infant feeding – efficacy of increasing frequency of feeding to improve supply of breastmilk (and lack of efficacy of eating specific foods, eg pig trotter), importance of vegetables for infants 6+months, inappropriateness of sweets as health foods;
  - Signs requiring urgent care for infants – fast breathing;
  - Appropriate way to feed ill child – give more food than usual.

The evaluation did not get the opportunity to assess the specific range of community health messages in the IEC programme targeting household doctors but these should be appropriate and well targeted messages focused on priority health areas.

### ***Considerations for the final evaluation***

- (13) For the endline, additional qualitative data will be essential to illuminate the quantitative findings, particularly to enable managers to grasp why and where the Project has succeeded or encountered difficulties. This will assist in conceptualising and planning follow-on Projects.



- (14) Benchmarking provides a rough snapshot of “capacity” at baseline across each sample group. While its use for the mid-term evaluation is limited, it can be used at endline assuming a representative sample has been achieved. At that point, it will be necessary to undertake specific comparisons of mean and median (range), as well as proportional change within sample groups at each level (ie, low, medium and high capacity). This means that full data sets from the baseline survey should be retained for this purpose.
- (15) All tools should be carefully reviewed for the endline evaluation. It is clear that some items in the audits were either dropped from the original plan, or are not held in the specific site within facilities that was expected at the time of the baseline. Clearer instructions are required on the audit instruments.
- (16) Analysis of ri and county obstetricians should be undertaken separately which will require re-analysis of baseline data as well as endline.
- (17) It is suspected that high baseline results were partly due to it being undertaken in areas where training had already occurred. It may be useful to re-analyse baseline data based on regions where no training had occurred prior to baseline to provide a clear comparison with endline.
- (18) The Project team should consider whether staggering the endline evaluation would be more appropriate, with immediate outcomes such as changes in knowledge and physical capacity being undertaken early and utilisation indicators being evaluated after a suitable period.
- (19) It is not recommended that either maternal or infant/child mortality be used to draw conclusions about the impact of the Project because of the difficulty of attribution (other projects occurring simultaneously) and confounding (natural disasters or other events negatively affecting health).
- (20) For the final evaluation, appropriate time should be allocated to working with the local evaluation team, as one day's preparation in the mid-term evaluation was not sufficient to ensure shared understanding of use of tools.

## Annex 1 (a)

### Data Collection Tools

(Note: This is an example. Similar formats used for other health facility levels)

Code \_\_\_\_\_

#### Health Facility Director Questionnaire/ and Health Facility Audit – County Hospital Mid-Term Evaluation: DPRK WCH Project

Date of Interview \_\_\_\_\_

Name of Interviewer \_\_\_\_\_

Hello, my name is \_\_\_\_\_. I work in NIPHA in Pyongyang.

Your area has received a program to improve health facilities and services for women and children. We hope the program will make women and children more healthy. In early 2009, before the program started, we came to hospitals and ri clinics to study the situation at that time. Now we have returned to see if there have been any changes since the program started. This information will also help us make adjustments to the program as it continues for the next period.

We would like to learn about practices here and the state of equipment and medicines.

This interview/audit will take about 1 hour. You do not have to participate, and will have no negative consequences if you say no. What you say is confidential. Your name and identity will not be included in any report.

Are you willing to take part in this survey?

Informed consent obtained \_\_\_\_\_ (signature of interviewer)

#### A. Facility Characteristics

1. Ask the Facility Director how many staff work at the facility and the number of beds. Record this data in the table below.

Characteristic	Number
<b>No. of staff</b>	
Doctors	
Nurses	
Midwives	
Other	
<b>No. of beds</b>	

## **B. Questions about Quality Assurance and Supervision**

Ask the Facility Director the following questions.

2. How do you conduct clinical supervision in this facility? (open) (ask if any more but do not read out the answers)

1. Observation of clinical practices
2. Review of patient records
3. Technical meetings of Staff
4. Other \_\_\_\_\_ If other you must write the answer.

3. How often do you have your regular technical orientation meetings with Staff? (open) (Choose one answer only)

1. Every day
2. Every 2-6 days
3. Once a week
4. Less than once a week
5. Never

4. How many times did your facility receive a clinical supervisory visit from the higher level in the last three months? (open) (choose one answer only)

1. Once
2. Twice
3. Three times
4. More than three times
5. Never

5. What did the supervisor do during the last visit? (open) (ask if any more but do not read out the answers)

1. Observation of clinical practices
2. Review of patient records
3. Technical meetings of Staff
4. Other \_\_\_\_\_ If other you must write the answer.

6. Do you keep staff training records at this facility? (open)

1. Yes
2. No
3. Don't know

## **C. Health Information System**

7. Do you have a computer to record health information?

1. Yes
2. No

8. How often do you collate a Health Information Report and send to the relevant authority?

1. Weekly
2. Monthly
3. Every six months
4. Annually
5. Never

9. Ask the Facility Manager to show you a copy of the Facility Health Information Report for the month of October 2010.

1. sighted
2. not sighted

10. How do you use the health information that you collect to manage this facility? (open) (ask if any more but do not read out the answers)

1. Collect and report to the relevant authority
2. Reporting of particular health problems to the relevant authority
3. Planning the service delivery of your facility and staff
4. Other \_\_\_\_\_ If other you must write the answer.

#### D Health Services Information

11. Ask the Facility Director to see the health records on service rates at the facility. Record the rates in the table below.

Health Services Information	Number
1. How many outpatients did the facility manage in the month of October 2010?	
2. How many inpatients did the facility manage in the month of October 2010?	
3. How many outpatients who were children under-5 did the facility manage in the month of October 2010?	
4. How many cases of children under 5 were referred from Ri level to facility in the month of October 2010?	
5. How many deaths of children under 5 were recorded in the facility in all of 2010 (Jan 1-Dec 31)?	
6. How many operations did the facility perform in the month of October 2010?	
7. How many post-operative infections were there in the month of October 2010?	
8. How many normal vaginal deliveries did the facility manage in all of 2010 (Jan 1-Dec 31)?	
9. How many complicated deliveries did the facility manage in all of 2010 (Jan 1-Dec 31)?	
10. How many complicated deliveries were referred to the Provincial hospital in all of 2010 (Jan 1-Dec 31)?	
11. How many caesarean sections did the facility perform in all of 2010 (Jan 1-Dec 31)?	
12. How many cases of women aged 15-49 were referred for reproductive health services from the Ri level to the facility in the month of October 2010? (including complicated deliveries)	
13. How many cases of women aged 15-49 were referred for reproductive health services from the facility to the Provincial hospital in the month of October 2010? (including complicated deliveries)	
14. How many maternal deaths have you had in this facility in all of 2010 (Jan 1-Dec 31)?	

## E. Physical Capacity of the Facility

### Operating Theatre

12. Ask to visit the Operating Theatre. Observe the physical condition of building and availability of essential equipment and consumables as listed in the table below. For each of the items observed, record "1" for "yes" or "2" for "no" in the table below. Assess the physical condition of each of the item by ensuring that it is in working order. Record "1" for working or "2" for not working in the table below.

Building and equipment	Observed (Y=1 N=2)	Condition Good = 1 Poor = 2
Cleanliness of the facility		
Sink and running water		
Steam sterilizer		
Resuscitator bag valve & mask (adult)		
Resuscitator bag valve & mask (paed)		
Blood pressure measuring equip		
Endotracheal tubes cuffed (adult)		
Endotracheal tubes un cuffed (paed)		
Ceiling light		
Light for examination		
Laryngoscope (adult)		
Laryngoscope (paed)		
Mask & Tubing to connect O2 supply		
Electric cautery		
Oropharyngeal airway (adult)		
Oropharyngeal airway (paediatric)		
Oxygen concentrator		
Stethoscope		
Suction		
Thermometer		
Air conditioner/heater		
Universal operating table for aseptic		
Simple operating table for septic		
Power backup system – eg. Generator		
Bedside vital signs monitor		
ECC		
Standard surgical instruments		

NB. Good = working and good condition  
 Poor = not working or old or poor condition

**Delivery Room**

13 Ask to visit the Delivery Room. Observe the physical condition of building and availability of essential equipment and consumables as listed in the table below. For each of the items observed, record "1" for "yes" or "2" for "no" in the table below. Assess the physical condition of each of the item by ensuring that it is in working order. Record "1" for working or "2" for not working in the table below.

<b>Building and equipment</b>	<b>Observed (Y=1 N=2)</b>	<b>Condition Good = 1 Poor = 2</b>
Cleanliness of the facility		
Sink and running water		
Sterilizer		
Resuscitator bag valve & mask (adult)		
Resuscitator bag valve & mask (paed)		
Blood pressure measuring equip		
Vaginal speculum graves		
IV infusion set		
Endotracheal tubes cuffed (adult)		
Endotracheal tubes un cuffed (paed)		
Examination Table (adult)		
Examination Table (paed)		
Light for examination		
Warmer for baby		
Mask & Tubing to connect O2 supply		
Extractor, mucus		
Oropharyngeal airway (adult)		
Oropharyngeal airway (paediatric)		
Oxygen concentrator		
Stethoscope		
Suction		
Thermometer		
Weighing scales		
Air conditioner/heater		
Standard delivery bed		
Phototherapy unit		
Foetal stethoscope		
Vacuum extractor		
Incubator		
O2 hood		
PH Oximeter		
Ultra sound machine		

NB. Good = working and good condition

Poor = not working or old or poor condition

Consumables	Currently Available (Y=1 N=2)	Stock-out any time last 3 months for more than 3 days at a time (Y=1 N=2)
Suture		
Operation glove		
Examination glove		
Theatre gown		
Surgical drainage tubes		
Syringes, disposable		
IV infusion set		
Gauze		
Adhesive tape		
Soap/surgical scrub		
Surgical blades		
Neonatal umbilical clamps		
Neonatal feeding tubes		
Neonatal tubes for aspiration of meconium		
Urethral Catheter		

### Medicines

14. Ask to visit the pharmacy and observe the medicines available at the facility. Observe whether each of the items is currently in stock. Record "1" for "yes" or "2" for "no" in the table below. For each of the items, ask whether items have been out of stock any time over the last 3 months. Record "1" for "yes" or "2" for "no" in the table below.

Medicines	Currently Available (Y=1 N=2)	Stock-out any time last 3 months for more than 3 days at a time (Y=1 N=2)
Ampicillin		
Amoxicillin		
Iron/folic tabs		
Lidocaine		
Oxytocin		
Ergometrine		
Paracetamol		
Povidine iodine		
Saline (IV solution)		

Medicines	Currently Available (Y=1 N=2)	Stock-out any time last 3 months for more than 3 days at a time (Y=1 N=2)
Tetracycline		
Metronidazole		
Gentamycin		
Magnesium sulphate		
Hydralazine		
Ketamine		
Chloramphenicol		
Nystatin		
ORS		
Sulfamethoxazole		

**Laboratory and blood centre – Building, Equipment and Supplies**

15. Ask to visit the Laboratory and blood centre within the facility. Observe the physical condition of building and availability of essential equipment and supplies in each of these departments as listed in the table below. For each of the items observed, record "1" for "yes" or "2" for "no" in the table below. Assess the physical condition of each of the item by ensuring that it is in working order. Record "1" for adequate or "2" for not adequate in the table below.

Laboratory	Observed (Y=1 N=2)	Condition Good = 1 Poor = 2
Microscope		
Centrifuge		
Pipettes & glass ware		
Water supply		
Incubator		
Refrigerator		
<b>Blood Transfusion</b>		
Refrigeration		
Centrifuge		
Blood collection sets including blood bags		
Blood transfusion sets		
Blood test kit		
Blood grouping reagent		

NB. Good = working and good condition  
 Poor = not working or old or poor condition



### F. Treatment Protocols and Guidelines

16. Ask the Facility Director to show you a copy of the treatment guidelines listed in the table below. Record "1" for "yes" if you can see the guidelines. Record "2" for "no" if the treatment guidelines cannot be found. Record the year the guidelines were published.

<b>Protocols and Guidelines</b>	<b>Observed in facility Yes = 1 No = 2</b>	<b>Year published</b>
Basic EmOC		
ENC		
Comprehensive EmOC		
Safe abortion		
RTI		
ARI		
Diarrhoeal Disease		
IMCI		
Use of blood products & QA for blood transfusion		
Laboratory practices and QA		

**Annex 1 (b)**

Code \_\_\_\_\_

**KAP County Hospital and Ri Clinic Obstetricians/Midwives  
Interim Evaluation: DPRK WCH Project**

Date of Interview \_\_\_\_\_

Name of Interviewer \_\_\_\_\_

Hello, my name is \_\_\_\_\_. I work in NIPHA in Pyongyang.

Your area has received a programme to improve health facilities and services for women and children. We hope the programme will make women and children more healthy. In early 2009, before the programme started, we came to hospitals and ri clinics to study the situation at that time. Now we have returned to see if there have been any changes since the programme started. This information will also help us make adjustments to the programme as it continues for the next period.

We would like to ask you some questions about how you handle different medical conditions and the ways you provide care.

This interview will take about 30-45 minutes. You do not have to participate, and will have no negative consequences if you say no. What you say is confidential. Your name and identity will not be included in any report.

Are you willing to take part in this survey?

Informed consent obtained. Signature of interviewer \_\_\_\_\_

**A. Demographics**

1. Age ##
2. Duration working in this facility ## years / ## months
3. Rank level

**B. Questions about training**

4. Have you received training in care of pregnant women and delivery care in the past 2 years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No
5. Have you received training in management of post-partum haemorrhage in the past 2 years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No
6. Have you received training in management of eclampsia in the past 2 years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No
7. Have you received training in newborn resuscitation in the past 2 years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No

### C. Questions about pregnancy care

8. What should be included in an antenatal visit? (open question, ask if "anything else?" but do not read out the answers. Circle answers given.)

1. Take a history – name, age, past medical problems, past obstetric history
2. Estimate delivery date (EDD)
3. Check mother's weight
4. Check blood pressure (BP)
5. Check for signs of anaemia
6. Check for signs of swelling
7. Check fundal height
8. Check position of baby
9. Check foetal heart
10. Give advice about nutrition in pregnancy
11. Give advice about iron supplementation

9. Why is it important to check the blood pressure during an antenatal visit, and what should the BP be? (open, do not prompt)

*Correct answer: BP should be less than 140/90. High blood pressure is a medical emergency and a common cause of maternal death*

1. Partly or totally correct
2. Not correct

10. Why is it important to check for signs of swelling during an antenatal visit? (open, do not prompt)

*Correct answer: Some ankle swelling is normal but swelling that also involves heads and face may be a sign of pre-eclampsia.*

1. Partly or totally correct
2. Not correct

### D. Management of post-abortion care

11. What are the symptoms of post-abortion infection or sepsis? (open question. Don't prompt, but ask "any others" several times for fuller response. Circle answers given.)

1. Lower abdominal pain
2. Tender uterus
3. Prolonged bleeding
4. Malaise
5. Fever
6. Foul-smelling vaginal discharge
7. Purulent cervical discharge
8. Cervical motion tenderness

12. What is the correct management of post-abortion sepsis/infection?. (open question. Do not prompt, but can ask: "anything else?")

*Correct answer = Antibiotics and then manual vacuum aspiration*

1. Fully correct
2. Partly correct
3. Totally incorrect

13. Do you do manual vacuum aspiration in this facility?

1. Yes
2. No

## E. Management of Maternal Health

*Scenario one*

14. For this question I would like you to read Scenario one. I will give you a copy to read at the same time. (remove the last sheet and give to him/her).

A woman has just given birth and delivered the placenta. You observe that she has started to bleed, so you massage the fundus, give the recommended drug to promote contractions, insert a catheter to empty the bladder and help her to begin breastfeeding. However, she is still bleeding quite heavily, blood pressure has dropped and she feels faint. What should you do next? (open question. Do not prompt, but can ask: "anything else?" Circle the answers given.)

Correct answers:

1. Start an IV to expand plasma
2. Checked that she has no tears from the birth
3. Inspect the placenta to see if it is complete
4. Begin bi-manual compression (internal)
5. Prepare for transfer
6. Do blood grouping to prepare for blood transfusion

### Further questions: (do not prompt)

Question	Correct answer	Circle as appropriate
15. How much blood loss is classified as a PPH?	500 ml or more in first 24 hours after delivery	1. Fully correct 2. Partly correct 3. Totally incorrect
16. Why is it necessary to insert two IV lines?	One to infuse fluid quickly and one to administer medication	1. Fully correct 2. Partly correct 3. Totally incorrect
17. How long would you continue to use Bimanual Compression?	Until the bleeding is controlled – as long as it takes.	1. Fully correct 2. Partly correct 3. Totally incorrect

Question	Correct answer	Circle as appropriate
18. What drugs should be given to stop bleeding?	Oxytocin or Ergometrine	1. Fully correct 2. Partly correct 3. Totally incorrect
19. What should a contracted uterus feel like on abdominal palpation after delivery?	Firm (eg like an orange) and size of 16 week pregnancy; half-way between pubic bone and belly button.	1. Fully correct 2. Partly correct 3. Totally incorrect

*Scenario Two*

20. For this question, I would like you to read Scenario 2. This scenario appears on the sheet I gave you, so you can read it and refer to it.

A woman who is 38 weeks pregnant has blood pressure of 170/100, blurred vision and upper abdominal pain. What are the 2 best drugs for treating this condition? (open, do not prompt)

*Correct answer: magnesium sulphate or hydralazine according to guidelines*

1. Fully correct
2. Partly correct
3. Totally incorrect

**F. Danger signs post-partum**

21. What are the maternal danger signs in the first 3 days after childbirth that require medical care? (open question; ask "anything else?" Circle the responses given.)

1. fever
2. excessive bleeding
3. discharge with a bad smell
4. shivering
5. severe pain in lower abdomen
6. severe headache or blurred vision

**G. Danger signs in newborns and management**

22. What are the danger signs in newborns straight after the delivery? (open; ask 'any more?' but do not prompt. Circle the answers given or write if 'other'.)

1. gasping or not breathing;
2. breathing with difficulty (less than 30 or more than 40 breaths per minute, in-drawing of the chest or grunting);
3. central cyanosis (blueness);
4. preterm or very low birth weight (less than 1 500 g);
5. lethargy;
6. hypothermia/cold stress (auxiliary temperature less than 36.5°C);
7. convulsions
8. Other \_\_\_\_\_

## H. Questions about infant feeding

23. What percentage of women breastfeed their babies in this community?
1. All or nearly all
  2. More than half but less than 80%
  3. Less than half
  4. Don't know
24. After a normal birth, if both mother and baby are healthy, when should breastfeeding begin?
1. Immediately / within first hour (*if this answer is given, skip question 25, go to question 26*)
  2. >1-6 hours
  3. 7-12 hours
  4. > 12 hours
  5. When the milk comes in
25. {*this question only for those who answered 2, 3, 4, 5 in previous question*} In your opinion, what should be given to the baby until the mother begins breastfeeding? (open question; ask 'any more?' Circle answers given or write if 'other'.)
1. water only
  2. water and other drinks
  3. formula
  4. formula with and water
  5. cow's milk (any type)
  6. cow's milk (any type) with and water
  7. other \_\_\_\_\_
  8. nothing
26. Can you tell me until what age a baby should receive only breast milk, that is, no other food, water, milk or other drinks?
1. ## (number of months)
  2. Don't know
27. If a mother does not have enough breast milk, how can she produce more? (open question, can choose any number of responses. Circle answers given or write if 'other'.)
1. She should eat more food
  2. She should eat specific foods
  3. She should rest more
  4. She should feed her baby more frequently
  5. Other (specify) \_\_\_\_\_
  6. Nothing can be done
  7. Don't know

### Scenarios for Participant

#### Scenario One

A woman has just given birth and delivered the placenta. You observe that she has started to bleed, so you massage the fundus, give the recommended drug to promote contractions, insert a catheter to empty the bladder and help her to begin breastfeeding. However, she is still bleeding quite heavily, blood pressure has dropped and she feels faint. What should you do next? (open question. Do not prompt, but can ask: "anything else?")

#### Scenario Two

A woman who is 38 weeks pregnant has blood pressure of 170/100, blurred vision and upper abdominal pain. What are the two best drugs for treating this condition?

**Annex 1 (c)**

Participant Code \_\_\_\_\_

**KAP Household Doctors**

**Interim Evaluation: DPRK WCH Project**

Date of interview \_\_\_\_\_

**Name of interviewer** \_\_\_\_\_

Hello, my name is \_\_\_\_\_ and I work in NIPHA in Pyongyang.

Your area has received a programme to improve health facilities and services for women and children. We hope the programme will make women and children more healthy. In early 2009, before the programme started, we came to hospitals and ri clinics to study the situation at that time. Now we have returned to see if there have been any changes since the programme started. This information will also help us make adjustments to the programme as it continues for the next period.

We would like to ask you some questions about how you handle different medical conditions and the ways you provide care.

This interview will take about 30-45 minutes. You do not have to participate, and will have no negative consequences if you say no. What you say is confidential. Your name and identity will not be included in any report.

Are you willing to take part in this survey?

**Informed consent obtained? Signature of interviewer** \_\_\_\_\_

**A. Demographics**

1. Age ##
2. Duration working in this facility ## years / ## month

**B. Questions about training**

3. Have you received training in "IMCI" in the past two years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No / don't know
4. Have you received any other training on child health in the past two years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No / Don't know
5. Have you received training in "EmOC" in the past two years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No / don't know
6. Have you received training in care of pregnancy, delivery and neonatal care (all three types) in the past 2 years?
  1. If yes, how many days total and when (latest)? ## total days ## month ## year
  2. No / Don't know

### C. Question about providing care to pregnant women

7. For this question, I would like you to read Scenario 1. I will give you a copy for you to read at the same time. (remove the last sheet and give to him/her)

A woman who is 38 weeks pregnant has blood pressure of 170/100, blurred vision and upper abdominal pain. Can you tell me: what are the two best drugs for managing the most critical symptoms? (open, do not prompt – do not give any more information)

Correct answer: magnesium sulphate or hydralazine

1. Fully correct
2. Partly correct
3. Totally incorrect

### D. Questions about infant feeding

8. What percentage of women breastfeed their babies in this community?

1. All or nearly all
2. More than half but less than 80%
3. Less than half
4. DK

9. After a normal birth, if both mother and baby are healthy, when should breastfeeding begin? (open question)

1. Immediately / within first hour (if this answer is given, skip question 10, go to question 11)
2. >1-6 hours
3. 7-12 hours
4. > 12 hours
5. When the milk comes in

10. {this question only for those who answered 2, 3, 4 or 5 to previous question} In your opinion, what should be given to the baby until the mother begins breastfeeding? (ask if any more but do not read out the answers. Circle answers given or write if 'other'.)

1. water only
2. water and other drinks
3. formula
4. formula and water
5. cow's milk
6. cow's milk and water
7. other \_\_\_\_\_
8. nothing

11. Can you tell me until what age a baby should receive only breast milk, that is, no other food, water, milk or other drinks?

1. ## (number of months)
2. Don't know

12. When should infants start to be given any other milk, watery food or solid food (open)?

1. Less than 1 month
2. >1 – 3 months
3. >3 up to less than 6 months
4. At or after 6 months



13. Ideally, in general, at what age should the mother continue breastfeeding her child, even if giving other foods? (open)

1. ## (months)
2. Don't know

14. What are the main reasons women stop breastfeeding early? (open question, can choose more than 1 response: "early" means before the age given in last question)

1. Mother ill
2. Baby ill
3. Breast milk was not sufficient
4. Did not want to breastfeed
5. Had to leave baby in childcare / had to go out to work
6. Other \_\_\_\_\_

15. If a mother does not have enough breast milk, how can she produce more? (open question, can choose any number of responses or write if 'other')

1. She should eat more food
2. She should eat specific foods
3. She should rest more
4. She should feed her baby more frequently
5. Other (specify) \_\_\_\_\_
6. Nothing can be done
7. Don't know

16. Can you tell me what foods, in addition to breast milk, should be given to an 8-month old baby? (ask if any more but do not read out the answers. Circle answers given or write if 'other').

1. Soy-based foods OR milk OR eggs OR fish OR dried bean or seeds OR meat (protein foods) (any of these, circle 1)
2. Fortified porridge (local recipe)
3. Yoghurt
4. Vegetables
5. Other (specify): \_\_\_\_\_
6. Other (specify): \_\_\_\_\_
7. Other (specify): \_\_\_\_\_

## E. Managing illness in children

17. Sometimes children have severe diseases and should be taken immediately to a health facility. If you were advising mothers, what symptoms mean they should seek care immediately? (ask if any more but do not read out the answers. Circle answers given or write if 'other').

*Important note: If you are not sure if a certain sign fits in one of the categories, write it down in full and check with your supervisor later.*

1. Child not able to drink or breastfeed
2. Child becomes sicker
3. Child develops a fever
4. Child has fast breathing
5. Child has difficult breathing
6. Child has severe dehydration OR diarrhoea OR dysentery OR blood in the stool
7. Other (specify): \_\_\_\_\_

18. When a child is ill, should the mother offer the child more food than usual, less food than usual, no food at all, or about the same as usual? (ask question exactly as written) (Important note: only one choice permitted)

1. No food at all
2. Less food than usual
3. About the same amount of food as usual
4. More food than usual
5. Don't know

19. For this question, I would like you to read Scenario 2. This scenario appears on the sheet I gave you, so you can read it and refer to it.

You are visiting a home where the mother reports that her child aged 14 months has had >3 loose stools per day for 3 days. There is no blood in the stools. When you examine the child you notice she is restless, irritable, has sunken eyes and drinks eagerly.

What actions should you take? (open question; ask 'any more?' but do not prompt. Circle answers given or write if 'other'.)

1. prescribe ORS (or show mother how to make home-made ORS)
2. advise mother to give extra fluids
3. advise mother to continue feeding the child
4. prescribe antibiotics
5. advise mother to stop feeding the child
6. advise mother to seek care if the child does not improve
7. other \_\_\_\_\_

21. For this question, I would like you to read Scenario 4. This scenario appears on the sheet I gave you, so you can read it and refer to it.

A teenager came to the facility with her small sister aged 13 months. She said that her sister was coughing for five days and has had temperature since yesterday night. She remembers that her sister had a generalized rash about one month ago and that neighbours in the village said that it was measles. Her mother continues to breastfeed her sister. There is no malaria in the place where they live. The health worker weighed the child (11 kg) and checked temperature (38.8°C). The health worker counted 48 breaths per minute and noticed no chest in-drawing. No other clinical signs were found. The vaccination card shows that the child received all vaccinations as well as a dose of vitamin A four months ago.

*Now, please tell me all the actions and/or prescriptions you would take to provide this child with the most appropriate treatment. You should imagine (assume) that all needed drugs are in stock in the facility and that there is a referral facility available 20 minutes away.*

**(Circle the letter next to each of the following actions mentioned by the health worker. Do not prompt. Ask "any more?" but do not read the answers. Circle answers given or write if 'other'.)**

1. Recommends urgent referral to an hospital
2. Administer Ringer Lactate or Normal saline IV solution
3. Administer liquid by naso-gastric tube
4. Inject one dose of an injectable antibiotic
5. Inject one dose of a second antibiotic
6. Prescribe injectable antibiotic for five days
7. Give one dose of an oral antibiotic
8. Prescribe oral antibiotics for five days
9. Inject one dose of quinine

10. Give one dose of oral antimalarial
11. Prescribe quinine for five days
12. Prescribe oral antimalarials for 3 days
13. Administer ORS at the facility
14. Advise on giving ORS on the way to hospital
15. Prescribe ORS for home treatment
16. Give one dose of paracetamol
17. Prescribe paracetamol for home treatment
18. Give one dose of vitamin A
19. Treat to prevent low blood sugar
20. Recommends to continue breastfeeding
21. Recommends to give food and fluids other than breast milk
22. Advise mother to keep infant warm (
23. Other \_\_\_\_\_

**THANK THE PARTICIPANT WARMLY FOR HIS/ HER TIME IN ANSWERING THESE QUESTIONS.  
SCENARIOS**

***Scenario 1.***

A woman who is 38 weeks pregnant has blood pressure of 170/100, blurred vision and upper abdominal pain. Can you tell me: what are the 2 best drugs for managing the most critical symptoms?  
What actions should you take?

***Scenario 2.***

You are visiting a home where the mother reports that her child aged 14 months has had >3 loose stools per day for 3 days. There is no blood in the stools. When you examine the child you notice she is restless, irritable, has sunken eyes and drinks eagerly.  
What actions should you take?

***Scenario 4.***

A teenager came to the facility with her small sister aged 13 months. She said that her sister was coughing for five days and has had temperature since yesterday night. She remembers that her sister had a generalized rash about one month ago and that neighbours in the village said that it was measles. Her mother continues to breastfeed her sister. There is no malaria in the place where they live. The health worker weighed the child (11 kg) and checked temperature (38.8°C). The health worker counted 48 breaths per minute and noticed no chest in-drawing. No other clinical signs were found. The vaccination card shows that the child received all vaccinations as well as a dose of vitamin A four months ago.

*Now, please tell me all the actions and/or prescriptions you would take to provide this child with the most appropriate treatment. You should imagine (assume) that all needed drugs are in stock in the facility and that there is a referral facility available 20 minutes away.*

## Annex 1 (d)

(Note: This is an example. Similar question guides were developed for other health staff – obstetricians, household doctors and other health facility levels)

### **In-depth Interview, County Hospital Director**

Mid-Term Evaluation, DPRK WCH Project. March 2011.

Code \_\_\_\_\_

Date of Interview \_\_\_\_\_

Name of Interviewer \_\_\_\_\_

Hello, my name is \_\_\_\_\_. I work in \_\_\_\_\_.

Your area has received a programme to improve health facilities and services for women and children. We hope the program will make women and children healthier. In early 2009, before the programme started, we came to hospitals and ri clinics to study the situation at that time. In your role you have some experience with the introduction and implementation of the programme. This would include your perceptions about what has gone smoothly, but also where there have been delays or difficulties, and why. This information is very important in helping us make adjustments to the program as it continues for the next period.

This interview will take about 45 minutes. You do not have to participate, and will have no negative consequences if you say no. What you say is confidential, and you do not have to answer questions if you don't want to. Your name and identity will not be included in any report.

### **Topics:**

#### **Supervision**

We know that regular supervision of staff takes place in the hospital. Could you tell us which staffs are involved in this supervision (who supervises whom)? And what is the system, in detail? Please describe which levels are supervised from this level (eg, ri?). *(Seek details on frequency, mechanisms such as check-list, whether observation of practice is part of it, etc).*

Are you involved in supervision yourself? *(Seek details.)*

How is information fed back to staff? *(Seek details on whether it is discussed alone, in group, verbal, written, etc)*

Where knowledge or skill gaps are found, how are these handled? *(Seek details on system, frequency, opportunities for refresher training.)*

We know that staffs from one level often supervise those from a lower level. Do you feel that county level staff are facing any challenges in supervising ri staff in relation to maternal or child care? *(Seek details on this.)*

Can you tell me if anything has changed in your system of supervision since the Project started? *(Prompt for full details.)*

Do you feel you have sufficient time and opportunities for comprehensive supervision? How could supervision be improved, in your opinion? *(Seek details on what inputs would be needed, eg additional staff, training courses, equipment, training materials, etc)*

### **Training**

The Project has introduced more training for comprehensive EmONC and IMCI. Who has conducted the training, and where for this hospital? Have your staffs been involved in passing on new information to lower levels? If so, what and how?

How would you assess this training in terms of staff confidence? Are there some areas that staff are more confident in than others? If so, what are they? What should be done to build staff confidence in those skills? Is there enough time and opportunities to practise new skills?

Can you tell us any examples or cases where the new skills have been used here, and if it made a difference in maternal, neonatal or child outcomes?

Do you think there is enough refreshers or in-service training following the initial training? If not, how much more is needed? Who should deliver this, and how?

What do you think of the written training materials? Are there any weaknesses or gaps that you have noticed, which we could modify for the future?

Have you got any suggestions to improve the training for your facility or other levels? What are the most important things to consider for effective training?

### **Health information systems**

Could you briefly describe your HIS and how the information is put into it? Who is responsible for which information? How is it recorded, and how often? How often is it collated and summarised in a written report?

Have you used this information as a basis for identifying any needs (eg for staff, equipment, skills) at your facility? If so, have you asked for support? From whom? Did you use your HIS as part of your reasons given in seeking additional support? Was that successful?

Have you ever used your summary data for planning at this facility? If so, how did you do that? Who was involved in that discussion?

What do you think are the best things about the HIS? Are there any weaknesses or challenges for you in using it? Is it too time-consuming? How many staff do you have who can manage the information to summarise and use it as intended? Is this adequate, or do you need more training for more staff?

Do you think ri level facilities are capable of using HIS for planning? Why or why not? How could you encourage or support them to do so?

### **Equipment and supplies**

This Project has provided new equipment, supplies and drugs for the county hospital. Can you give your views on the most important differences you've noticed in the functioning of the hospital since these supplies have arrived? (*Ask for examples, if possible, and details.*)

Can you think back on the arrival of these various supplies. Did they come all at once, little by little, or how? Has anything interrupted the arrival, eg weather or transportation problems?

Have you had situations where some crucial supplies were missing, and this affected your work? Please explain, if so.

Do you feel that staff know how to use all the equipment and supplies that have arrived? Do they like it all, or are they hesitant about using some of them – any of them? If so, what and why?

### **Neonatal and child mortality**

We know that even in the best situation sometimes new babies and children die. These deaths cannot always be avoided, but sometimes they occur because of delays in seeking treatment or delays in providing care. Sometimes facilities do not have the equipment, drugs or trained staff etc to save lives.

We know that very sick children are often referred to county (or provincial) hospitals, and thus are more likely to die there, even if they were first treated at ri level. Please think about either a neonatal or a child death at this facility. Could you tell us as much as possible about why you believe the death occurred? *(Seek details relating to care-seeking by mother, treatment at ri, referral actions, timeliness, etc)*

How could this death have been avoided? *(seek details about where action or knowledge at each point could make a difference)*

Have you had any "near-misses"? If so, please describe these cases, why they became dangerous, and what interventions were used. *(Seek details relating to care-seeking by mother, treatment and referral actions, timeliness, etc)*

How could this near-miss have been avoided? *(seek details about where action or knowledge at each point could make a difference)*

**Final question**

What do you still need at this hospital to improve the care that you provide? What are the most important things you would like to see?

**Thank you very much for your time.**

**Annex 1 (e)**

**In-depth Interview, (Ri) Mother of Infant aged 12-24 m**

Mid-Term Evaluation, DPRK WCH Project. March 2011.

Code \_\_\_\_\_

Date of Interview \_\_\_\_\_

Name of Interviewer \_\_\_\_\_

Hello, my name is \_\_\_\_\_. I work in \_\_\_\_\_.

Your area has received a programme to improve health facilities and services for women and children. We hope the programme will make women and children more healthy. In early 2009, before the programme started, we came to hospitals and ri clinics to study the situation at that time. We also met mothers of your children and asked them about child feeding and child illness.

We would like to know more about how your community supports pregnant women and young children.

This interview will take about 45 minutes. You do not have to participate, and will have no negative consequences if you say no. What you say is confidential, and you do not have to answer questions if you don't want to. Your name and identity will not be included in any report.

**Topics:**

**Health information and general health**

In general, how do people here get information about health? Which health staff do they usually meet to get information? How often do they see them? Where and when do they get a chance to discuss or learn about health from Ri staff?

What do you think are the main health problems in this area? Do problems change according to the season of the year?

In general, what do people do to try to stay as healthy as possible? What do they do to make children as healthy as possible?

**Pregnant women**

When a woman first thinks she might be pregnant, how does she find out if she is pregnant?

During pregnancy, what does she do to stay healthy for herself and her child?

- How about getting information and advice from the Ri clinic? How often does she go for check ups?
- What do the staff at the Ri clinic tell her about how to stay healthy?
- Can you tell me what you try to eat during pregnancy? Are there any foods you should avoid eating in pregnancy? Why? Do older women offer advice about this?
- What about working? Should women continue working until they go into labour, or stop at some point in the pregnancy? What advice do older women give to young mothers about this?

How do pregnant women plan for the delivery? Where do they usually like to deliver? Do they think about what they should do if there is an emergency, or they go into labour earlier than expected? How can they get care? Do they need to organise transportation?

Do you think the community can do anything to plan for emergency transportation? If so, what? What is needed to make it easier to make these plans? Do the Ri staff ever talk to the community about emergency transport? If so, what did they say?

Do women here prefer to have a vaginal birth or a caesarean birth? Why?

Where do women prefer to give birth? Why?

### **Infant feeding**

During your last pregnancy, what did the Ri health staff tell you about infant feeding? What did they say about breastfeeding? When should you start, and how long should you breastfeed? Did they tell you what you can do if you have any breastfeeding problems? What about if you felt you didn't have enough breast milk?

What did they tell you about giving babies other drinks or food in addition to breast milk? When should that begin? What foods are good to give as the first foods?

In this community, do the older people give advice to mothers about feeding their babies? What do they say about breastfeeding? And about giving other foods? (when, what?)

When a child is sick, do you think he/she should be given more food than usual, less food, or no food for a while? Can you tell me why?

When a child has diarrhoea, should the mother give the child anything to eat or drink? Why?

Can you tell me some healthy foods for children? If you don't have meat or fish to give a child, what can you give instead – what other foods are similar to meat and fish?

Should children eat vegetables? What about fruit? Why or why not?

### **Project**

Have you heard about this Project prior to today? What did you hear? Have you noticed anything different in your Ri in the past 2 years? If so, what?

### **Final question**

What would you like this Project to do to help make women and children healthier?

**Thank you very much for your time.**



Annex 2

**Clinical training completed 2009-2010**

Type of training	Provinces	Level	Type of participants	No. of participants	Training Duration Median (range)
BEmOC and ENC	N. Pyongyang S. Pyongyang S. Hwanghae	Central	Master trainers	5	12 days
		Provincial Hospital	Obstetricians	33	12 days (10-46)
		County Hospital	Obstetricians	130	12 days (10-18)
		Ri Clinic	Obstetricians	311	18 days (10-46)
CEmOC and ENC	N. Pyongyang S. Pyongyang S. Hwanghae	Central	Master trainers	16	17 days (12-21)
		Provincial Hospital	Obstetricians	73	13 days (12-21)
		County Hospital	Obstetricians	144	13 days (12-21)
		Ri Clinic	–	–	–
Safe Abortion	N. Pyongyang S. Pyongyang S. Hwanghae	Central	Master trainers	14	7 days (5-18)
		Provincial Hospital	Obstetricians	68	9 days (5-18)
		County Hospital	Obstetricians	309	5 days (5-18)
		Ri Clinic	–	–	–
IMCI	S. Hamgyong N. Hamgyong S.Hwanghae Ryanggang	Central	Master Trainers	48	11 days (2-55)
		Provincial Hospital	Paediatrics Trainers	96	5 days (2-55)
		County Hospital	Paediatrics Trainers	236	11 days (2-55)
		Ri Clinic	Household Doctors	790	55 days
	Hamhung and	Pre-service	Medical	468	10

Type of training	Provinces	Level	Type of participants	No. of participants	Training Duration Median (range)
	Haeju Medical Universities Hamgyong Ryanggang		students		(5-15)
New Household doctor training package	N.Hwanghae S.Hwanghae	?	?	?	?
Other MCH Training for Household Doctors	N.Hwanghae S.Hwanghae	Central	Master Trainers	6	8 days
		Provincial Hospital	Paediatrics Trainers	38	8 days
		County Hospital	Paediatrics Trainers	744	8 days
		Ri Clinic	Household Doctors	2434	8 days (4-90)
Blood use and safety	National Blood Centre	Central	Master trainers	67	3 days (3-9)
		Provincial Blood Centre	Staff	424	3 days (3-5)
		County Hospital	Staff	60	3 days
		Ri Clinic	–	–	–
Technical support to blood transfusion centres	10 Provinces	Provincial Hospital	Staff	40	Ongoing
		County Hospital	Staff	40	Ongoing
Laboratory practices	S Pyonggang Kangwon S. Hamgyong	Central	Laboratory staff	15	10 days
		Provincial Hospital	Laboratory staff	15	10 days
		County Hospital	Laboratory staff	50	10 days
<b>Other topics</b>					
Reproductive Tract Infection (RTI)	S.Hwanghae N. Pyonggang S. Pyonggang	Central	Mast trainers	15	6 days (5-6)
		Provincial	Obstetricians	115	6 days

Type of training	Provinces	Level	Type of participants	No. of participants	Training Duration Median (range)
	S. Hamgyong	Hospital			(5-12)
		County Hospital	Obstetricians	251	9 days (6-12)
		Ri Clinic	–	–	–
Hospital care for children	Central	Central	Master trainers	3	3 days
		County	County staff	40	3 days

**Training/activities on supportive supervision/referral completed 2009-2010**

Type of training	Provinces	Level	Type of participants	Total no. of participants	Training Duration Median (range)
Supportive Supervision	Pyongyang	Central	MOPH	36	2 days (2-5)
	N. Pyonggang	Provincial Hospital	Core technical groups	215	3 days (2-6)
	S. Pyonggang				
	County Hospital				
	Ri Clinic	?	90	6 days	
Referral and follow up mechanisms	Location unknown	Central	?	3	3 days
		Provincial Hospital	?	120	3 days
		County Hospital	?	30	3 days
		Ri Clinic	?	9	3 days
Field monitoring	S. Hamgyong S. Hwanghae	Central	MOPH	10	27 days

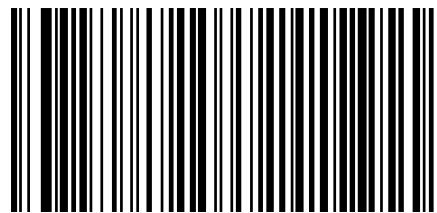
The current report has been produced by the Nossal Institute of Public Health of Melbourne University. It is based on the results of the Mid-Term Project Evaluation requested by WHO and the donor – Ministry of Unification of Republic of Korea. The main purpose of the Evaluation was to assess the extent to which the Project had achieved its milestones by 2011 in terms of Project inputs and outputs and to provide guidance for review and revision of Project strategies and activities based on the lessons learnt.



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