Formative research

Reducing preventable child deaths from pneumonia, diarrhoea and newborn complication in Mongolia

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Front cover photograph – Reindeer mother and children, Tsagaannuur *soum* (Khuvsgul Province).
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Executive summary

Background

Successful interventions have been undertaken to advance countries towards their Millennium Development Goal 4 (MDG 4), reducing child mortality. Yet, 6.6 million children under five died in 2012, mostly from preventable diseases, including pneumonia (17%) and diarrhoea (9%). Simple, inexpensive treatments are available for each of these conditions, yet too few children receive appropriate and timely care, particularly in high burden countries and in the most deprived settings due to a range of interrelated factors. In addition, worldwide percentages of neonatal deaths have increased and data shows that a growing proportion of infant mortality occurs at or around the time of birth – a clear sign that child survival efforts must focus on the precarious first month of life.

'Committing to Child Survival: A Promise Renewed', is the global movement to end preventable child deaths that emerged from the Child Survival Call to Action convened in June 2012. Mongolia has signed 'A Promise Renewed' pledge that calls for a targeted approach to focus on under-served populations and the residual burden of preventable child deaths.

Although Mongolia has reached its MGD 4 targets to reduce child mortality, there continues to be wide intra-provincial disparities. UNICEF East Asia and Pacific Regional Office (EAPRO) commissioned formative research to inform integrated programming on reducing preventable child deaths from pneumonia, diarrhoea and newborn complications in Mongolia. The research sought to define behavioural and social change outcomes by identifying a) barriers that prevent communities from adopting healthy behaviours and best practices for timely and appropriate care seeking, and b) the positive motivations and triggers that contribute to an enabling environment and support communities to seek care. It therefore presents a strong evidence base to inform programme design and develop robust but nuanced communication for development strategies.

Methodology

The research was conducted in line with prevailing ethical principles to protect the rights and welfare of all participants. Permission to undertake the research was granted by the Ministry of Health of Mongolia and supported by the UNICEF Country Office in Ulaanbaatar and the Provincial Office Murun.

Based on composite indexes indicating multiple deprivations and drivers of inequity, government assessment concluded that Khuvsgul Province (rural area) and Nalaikh District of Ulaanbaatar (peri-urban) were amongst the most disadvantaged regions in Mongolia. Consequently, UNICEF-Mongolia has concentrated its in-country efforts on these two areas and the most at-risk communities. It was appropriate, therefore, that these regions were selected as the target study sites for this research. In Khuvsgul, three *soums* (administrative units) were visited: Tsagaannuur, Renchinlkhümbe and Murun City (the capital of Khuvsgul Province). In Nalaikh District, a much smaller geographic area, research activities centred around a predominantly Kazakh sub-district, its family clinic and the general hospital which services all of Nalaikh District.

Data collection was carried out over ten days in October 2013 through in-depth interviews, semi-structured focus group discussions and technology surveys. In total, there were 162 participants from a number of different communities: Darkhad, Reindeer, Khalkh and Khotgoid in Khuvsgul, and Khalkh, Kazakh (Muslim minority group) and economic migrants in Nalaikh.

Primary caregivers of newborns and children suffering from (or recently suffered from) pneumonia and diarrhoea were purposively selected for interviews and focus group discussions in order to capture their recent experiences of childbirth and/or child illness. Additional interviewees included local healers, religious leaders and pharmacists. Focus group discussions were also held with fathers, community health workers, nurses and midwives.

All interviews and focus group discussions were conducted by the English-speaking primary investigator with a UNICEF research assistant translating between English and Mongolian or English and Kazakh. Each interview lasted for approximately 60 minutes and each focus group discussion for approximately 90 minutes. Audio recordings were made using a digital voice recorder and, along with field notes, served as the basis for transcriptions. Two doctors from the National Centre for Maternal and Child Health also acted as research assistants in collecting technology survey data.

The primary investigator was responsible for all thematic analysis. Dominant themes were identified through the systematic review of interviews, focus group discussions and technology surveys. The occurrence and reoccurrence of salient concepts were labelled throughout and emerging trends were critically analysed according to the research objectives. Coding and analysis was done by hand for qualitative data and through Excel statistical analysis for survey data. Computer-assisted qualitative data analysis software (ATLAS.ti) was used to analyse a sub-set of coded textual data to verify emergent themes. Initial findings were presented to key UNICEF and Ministry of Health staff at a roundtable workshop at the conclusion of data collection.

Report structure and outcomes

The research provides important new empirical data that contributes to understanding local barriers to newborn care and the treatment of childhood pneumonia and diarrhoea in Mongolia. By exploring complex issues regarding child health, this report is designed to be of operational use to UNICEF and its partners at local, national and international levels. The report presents a rapid review of the published literature and relevant policy and programmatic documents. It then outlines the demographic details of the primary caregivers interviewed and subsequently has six main sections: theories of causation, symptom recognition and prevention; care-seeking behaviours and practices; barriers to care seeking and treatment; solutions to barriers identified and drivers to care seeking; technology use for behaviour change and communication; and conclusion and recommendations. Prior to its completion, UNICEF and key stakeholders were given the opportunity to provide written and verbal feedback that was incorporated into the final report as appropriate.

The findings of this formative research should be used as a platform for the in-country workshop to develop communication for development strategy in 2014. In addition to the report, a complementary Powerpoint presentation has been designed that orientates results around the Social Ecological Model (SEM) in order to identify behavioural and organisational points to leverage communication activities.

A – Causation, symptom recognition and prevention

Pneumonia

Pneumonia was commonly attributed to cold weather and the progression of a cold or flu to more serious symptoms. In Nalaikh District, the addition of air and environmental pollution as common causes of children's respiratory illness was emphasised by both caregivers and healthcare professionals. The level of knowledge about pneumonia symptoms, progression and prevention was elevated amongst mothers of children who had experienced pneumonia. In general, women's ability to recognise the symptoms of respiratory distress was quite high. In interviews and focus group discussions, mothers frequently cited the following as symptoms of childhood pneumonia: difficulty breathing/pain in the chest/harsh sounds coming from chest; high temperature; vomiting thick yellowish substance; children crying more than normal; loss of appetite; and coughing. The most commonly cited method of prevention by mothers was to keep children warm and to keep clothes on the baby. Additionally, caregivers suggested that pneumonia could be prevented through the proper use of biomedical drugs; a healthy immune system; avoiding sudden temperature changes (such as from moving from inside to outside the family home); preventing children from getting flu; and avoiding people who are coughing. Fathers and *bagh feldshers* also described the need to support children's immune system with healthy foods and vitamins, and to keep a child warm as priorities for pneumonia prevention. Health workers at Suvarga Nalaikh Family Clinic suggested breastfeeding as a potential preventative strategy for pneumonia morbidity reduction. Mothers also discussed their belief that the severity of pneumonia symptoms would progressively worsen without biomedical treatment and/or drugs purchased from private pharmacists.

Diarrhoea

Caregivers were less confident in reporting the causes of diarrhoea than pneumonia. *'Improper hand hygiene'* was a common response from primary caregivers across all districts who also suggested that diarrhoea was caused by 'wrong food' (for example, contaminated milk or soups high in fat content), store-purchased food that had expired, improper baby formula, or drinking unclean water without boiling it first. Diarrhoea symptoms were varied and included: frequent watery stool; high temperature; weakened body; vomiting; loss of appetite; and thirst or dry mouth. Known methods of prevention included: proper nutrition for children and breastfeeding mothers; clean hands/proper hygiene; protection of children from cold and flu and other common child

diseases; keeping children warm; and giving oral rehydration solutions. Symptom recognition and prevention strategies amongst fathers were quite low. In discussing the severity of diarrhoea in relation to other child illnesses it was generally perceived that diarrhoea was a common or 'normal' problem. It would not warrant a trip to the clinic or hospital unless the condition persisted for several days and mothers feared their children were becoming dehydrated, or if the diarrhoea was paired with a second symptom such as vomiting.

In Nalaikh, health professionals discussed the frequency with which their diarrhoea patients were from poor families with unhygienic home practices. Here, incidences of childhood diarrhoea in particular were linked to poverty indicators, particularly the lower socio-economic status of people who worked in polluted environments. *Bagh feldshers* working in Khuvsgul Province believed that children's stomach problems were caused by improper feeding practices of caregivers and improper use of medicines.

Caregivers were also questioned about household water sources and storage, sanitation and hygiene practices. Hand-washing practices appeared to be of a generally high standard in both Khuvsgul and Nalaikh regardless of rural or urban location. In Tsagaannuur and Renchinlkhümbe (Khuvsgul Province) the most common source of water was from a nearby lake or river. These waters were described as being very clean. Families in these areas discussed boiling ice in the winter to release frozen water, but not for hygienic purposes. Caregivers in Murun and Nalaikh were more likely to source their water from a well and to describe boiling water before drinking for purification. Most mothers in Nalaikh were unhappy with the quality of water used in the home due to pollution from the dirty trucks or large plastic containers used to transport it from the well. Health professionals perceived that it was not the availability of water and its quality that were problematic, rather that the spread of disease was associated with mechanisms of water storage and transport, and lapsed hand-washing practices (among non-Kazakh people). Neither the use of latrines nor sanitation were raised as issues with regards to diarrhoea.

In all of the study sites it was common for caregivers to have access to a pit latrine for the personal use of between one and three families. Practices regarding the disposal of faeces from newborns, children not yet toilet trained or children experiencing frequent episodes of diarrhoea were different from adult practices for two main reasons: first, practical issues associated with children unable to use the latrine, or use it in a timely fashion; and secondly because of the belief that a baby's stool was cleaner than that produced by adults and it therefore warranted a different removal strategy, often away from more unsanitary adult waste collected in the latrine. A common practice was to discard child faeces into a plastic bag (used exclusively for this purpose). The bag would be used repeatedly and would be stored under a bed or in an outer room of the home until it was full, when it would be discarded by burying it in the ground or under a rock.

Pregnancy and birth complications

When questioned on specific experiences and the use of medication during pregnancy, women frequently mentioned swelling and high blood pressure as problems they had experienced. This had often led to their referral to the province hospital for delivery assistance, rather than delivering at their local *soum* clinic or hospital. Due to facility-based deliveries at these larger hospitals with better equipment and more qualified staff, women commonly stated that their deliveries (if not their pregnancies) were complication free. On further probing women discussed symptoms of high blood pressure during pregnancy as pregnancy poisoning, preeclampsia, eclampsia and hypertension. In addition, health professionals cited big babies (too large for safe vaginal delivery), premature birth and severe maternal pneumonia as common pregnancy complications. *Bagh feldshers* concluded that most alarming from their perspective, was premature birth and children born with hypoxia. Approximately half of the fathers in the focus group discussion listed high blood pressure, swelling and anaemia as common pregnancy compilations experienced by their wives. Of the two pregnancy complications most frequently referred to by mothers – swelling and high blood pressure – the former was often attributed to cold weather, whereas reasons for the latter were unknown. *Bagh feldshers* also suggested that poor birth spacing was increasing women's work burden and causing later-in-life complications for their children. Health workers in both Khuvsgul and Nalaikh attributed pregnancy complications to missed or infrequent antenatal care visits. One mother in Nalaikh concluded that stillbirths, miscarriages, and congenital impairments were common in her district due to environmental pollution.

B – Care-seeking behaviour and practices

Spiritual and traditional healers

Local healers were described as 'traditional' or 'spiritual' interchangeably. Local healing practices appeared to be particularly followed by two distinct ethnic groups, the Darkhad (Khuvsgul) and Kazakh (Nalaikh). It was accepted practice that local healers did not dispense medication, but performed traditional treatments deemed to be spiritual in origin, and prior to caregivers seeking biomedical assistance. Their treatment skills were attributed to years of experience, their ability to communicate with spirits, an inherent talent for assessing illnesses, and their potential to affect a cure. Neither Darkhad shamans nor Kazakh healers treated pregnant women or those experiencing any birth related complications.

In Khuvsgul, caregivers visited shamans for illnesses attributed to spiritual causes, not for pneumonia or diarrhoea as these were perceived to be medical conditions and their treatment fell, in general, within the remit of health workers. In Nalaikh, Kazakh healers did not treat pregnant women, but did have specific guidelines for mothers to follow when caring for newborns, including bathing and massage with sheep tail oil. Health professionals described the Kazakh habit of sequestering children indoors for the first forty days as a potentially harmful practice that prevented children from breathing fresh air. Kazakh healers also provided treatment for childhood pneumonia, involving applying raw horsemeat to the child's body.

Children with diarrhoea were treated with massage if diarrhoeal symptoms were accompanied by a headache. Caregivers also mentioned Buddhist monks as a source of spiritual healing, although not direct treatment. Through prayers and incense burning, families would appeal for help when illness conditions were severe enough to cause anxiety. Kazakh mothers and the Kazakh Imam interviewed described similar care-seeking behaviour. Caregivers also visited religious leaders for the purposes of prevention (for example, to pray for their daughters to have a safe delivery) or when all sources of biomedical treatment had been exhausted.

Traditional medicines

The use of traditional medicines was only described by one Reindeer mother who explained that Reindeer people living in Taiga used herbs for treating disease and illness as these communities were located far from health facilities. In Nalaikh, the use of traditional medicines was not discussed by any participant and it was made clear in both Nalaikh and Khuvsgul that local healers did not use or prescribe medicines as part of their treatment practices.

Pharmacies, self-medication and prescription drugs

For the majority of respondents, common symptoms including fever, coughing and a runny nose, were first treated with medicine bought at a pharmacy (including Paracetamol, Septrin, Antiflu and Chitamon). Oral Rehydration Solution was purchased (or home-made) to treat diarrhoea. If mothers were unable to attend a health clinic (due to distance, road conditions, lack of transportation or if the children's symptoms were first recognised at a time when the clinic was closed, such as at night or during a weekend), pharmaceutical treatment began at home and was continued until the symptoms resolved or the child was able to be taken to a clinic. In both regions, self-medication through independent purchasing of pharmaceuticals was common prior to seeking medical attention. Caregivers were familiar with the specific medicines they sought to purchase and would request them by name at the pharmacy. The choice of which pharmacy to visit depended primarily on its availability and location. In Khuvsgul there were usually one or two pharmacies per *soum*. In Nalaikh, the number of pharmacies increased with the population size, however proximity to the family home was still a primary consideration. Amoxicillin was the antibiotic most commonly prescribed for children, but was often prohibitively expensive. Pharmacists claimed that they would not sell amoxicillin without a prescription, but observational data suggested otherwise.

Health facilities

All participants had visited a health centre in the recent past. Although this was partly due to the purposive sampling methods used in the research, interlocutors confirmed that when available and accessible, health facilities were routinely utilised for child illness in Mongolia. Overall, respondents demonstrated a positive attitude towards biomedicine but had a negative impression of the delivery of health services at public facilities. Perception of the severity of the illness, generally attributed to recognition of more than one symptom (such as

vomiting and difficulty breathing) encouraged biomedical care seeking. This was true in both Khuvsgul and Nalaikh. All participants confirmed that their children had received vaccinations at health facilities with interrupted schedules only reported among herder/nomadic families in Khuvsgul. All participants concluded that delivery at a healthcare facility with skilled staff in attendance was the preferred method of childbirth. No interviewee had delivered at home, although several discussed women who had given birth in the ambulance on their way to the hospital. Regular antenatal care was common in both regions, again with the exception of herder women.

Bagh feldshers

Rural health workers were a crucial source of healthcare provision and knowledge for the rural population living outside *soum* centres. *Feldshers* performed household visits to the rural communities they served, but the services they provided to each area (or *bagh*) were highly variable depending on the distance to families, time of year (winter weather precluded access) and the level of institutional support (for example, low monthly petrol budgets restricted travel). When questioned about their responsibilities for following-up newborn children of rural families under their care, *bagh feldshers* could easily recite Integrated Management of Childhood Illness (IMCI) protocols. They stated that, according to IMCI guidelines, child assessments should be made during the first week of a newborn's life and should continue at regular intervals according to the child's condition and age, once a week for the first month and subsequently once a month.

Private clinics

Few caregivers had attended a private clinic. For many, it was a desirable although unattainable option due to costs and location, as private clinics only existed in central urban areas. Interviewees estimated that the average cost of visiting a private clinic was at least 20,000 Tugrik (11.67 USD), whereas attending a public clinic or hospital was, at least in theory, free at the point of service delivery. The small number of respondents who had attended a private clinic offered two primary reasons for doing so: first, to receive better services from doctors with more time and who were able to provide health counselling and advice (which public clinics and hospitals had failed to do in past); and secondly, due to their severe mistrust of public clinics arising from earlier misdiagnoses of their child's illnesses.

Facility births and immediate post-partum care

Women's descriptions of labour suggested that typically there would be four to six people in the delivery room including a doctor, nurse, midwife and a midwifery assistant. No mother described their husbands being in the delivery room, a fact reiterated by fathers in the focus group who suggested they were not present during delivery. Maternity staff confirmed that if the progression of birth was 'normal', the midwife would lead the delivery. Doctors only became involved during complicated or obstructed labours. Women who had normal deliveries recalled that the baby was placed on their chest soon after birth to provide warmth, typically until the placenta was delivered. Then the child was washed, dried and wrapped, and health staff rapidly initiated breastfeeding, usually 30 minutes to two hours after the birth.

The frequency with which mothers described Caesarean section was significant, particularly given the small sample size of the study. Of the 16 mothers who participated in in-depth interviews, six had required surgical intervention due to complications or as a result of a previous Caesarean section. Post-Caesarean post-partum care procedures varied, and breastfeeding was not initiated until several hours after the birth, or even the following day.

Low milk production and supplementary infant feeding practices

Mothers were advised by maternity staff to exclusively breastfeed for between six months and two years. Caregivers demonstrated a low level of knowledge about colostrum. For many women in both regions, particularly first time mothers, delay in milk production and difficulties with breastfeeding caused high levels of anxiety. Commonly described problems included the perception that the quality of milk produced after a Caesarean section was poor; the baby's inability to properly suckle due to hypoxia or respiratory distress; and inadequate or insufficient maternal nutrition. Health professionals in both Khuvsgul and Nalaikh acknowledged that low-milk production was a commonly voiced concern by caregivers. Mothers who reported to stop

breastfeeding prematurely or started supplementary feeding earlier than advised, forwarded several reasons, the most common being that low-milk production led them to use cow or reindeer milk, or infant formula. *Bagh feldshers* suggested that herder women discontinued breastfeeding due to time constraints. Supplementary feeding with cow or reindeer milk usually started during the second or third month after birth, whilst store-bought formula (more common in Nalaikh) tended to be introduced during the first month. Mothers who practised supplementary feeding often regarded it as the cause of their child's diarrhoea.

Child deaths from household accidents

Although it was not part of the research protocol for this project, the frequency with which both caregivers and health professionals mentioned child deaths and disfigurement from accidents should be highlighted. According to the Head of the Public Health Division in Khuvsgul Province, at least 12 children died because of accidents (traffic, drowning or suffocation) from January-September 2013. Doctors at Nalaikh Health Department speculated that approximately one-third of childhood deaths in their district were the result of drowning, household fires and other accidents.

Decision-making and gender roles

Gender was not perceived to be a dominant issue impeding women's ability to seek healthcare and the fact that the majority of doctors in Mongolia were women, warrants further investigation in terms of its impact on women seeking care. It was usually the mother, as primary caregiver, who first noticed a child's symptoms. Although family members, particularly husbands, were consulted about children's illnesses, this did not impede a woman's agency to act quickly on behalf of their child when necessary. A mother's decision was often the final one, particularly if the woman had several children and was therefore seen to be experienced. Mothers also explained that they alone would decide to seek treatment for their children. In both Khuvsgul and Nalaikh, it was mothers and grandmothers who brought their sick children to the clinic or hospital and, if the child were hospitalised, would stay until they were discharged. In their focus group discussion, fathers confirmed that it was usually the child's mother who decided to seek treatment, and defined the father's role to support of the mother's decision. Decisions to seek skilled birth attendance included greater participation by husbands, particularly in Khuvsgul, in part due to the potentially long travel times involved in reaching distant general hospitals. In comparison, the active participation of husbands was reduced in Nalaikh as expectant mothers lived in closer proximity to health facilities and with greater access to ambulance services.

C – Barriers to care seeking and treatment

Barriers to care seeking and treatment uptake that were identified by caregivers and other respondents were analysed according to five key themes: financial barriers; access barriers; socio-cultural and religious barriers; knowledge and information barriers; and health facility deterrents.

Financial barriers

Significant financial barriers to care seeking and treatment focused on the inability of participants to afford prescribed medicines or medical supplies. When caring for children with multiple illnesses (eg. pneumonia and diarrhoea simultaneously), the financial burden increased. Primary caregivers volunteered four coping mechanisms when faced with inability to afford medicine: selectively purchasing only those medicines they determined to be the most important; purchasing the least expensive medicines; purchasing partial doses only; or prioritising their child's health above their own health or other household needs to make it affordable. Regarding financial barriers associated with pregnancy and delivery, mothers at Murun General Hospital explained that they were required to purchase certain items or medicines at the pharmacy when the hospital was out of stock. Commonly purchased items included adult Pampers (for recently delivered mothers), iron injections for anaemia, suppositories, and pain relief. Though not as significant as the cost of prescription medicines, transportation expenses from the hospital in Murun were described by mothers and fathers as being very expensive. Although transport to Murun General Hospital was usually by ambulance or clinic car and was therefore free of charge, transportation home was the patient or caregiver's own responsibility.

Access barriers (distance, transport and location)

Access barriers were overwhelming for rural herder families who could not reach *soum* centres for treatment. Distance and lack of transport also had a negative effect on the uptake of referrals from *soum* centres to province hospitals. Issues of access were exacerbated during the coldest months of winter and early spring when weather conditions complicated travel. Distance was also problematic for herder families in the summer months when they were most likely to travel the furthest distance away from *soum* centres for improved grazing. Health workers confirmed that such challenges and long journey times were the determining factors in herder women failing to receive adequate ANC, and resulted in the higher morbidity and mortality rates for children from these ethnic groups. It was also logistically difficult to arrange transportation for health workers to access the Reindeer people. The limited budget provided for petrol was a challenge and ba*gh feldshers* claimed that due to insufficient petrol allowances, they often had to fund their own transport in order to reach rural families in need. Such access barriers were not reported in Nalaikh due to its peri-urban location.

Socio-cultural and religious barriers

Although seeking traditional or spiritual treatment from local healers was common in both Khuvsgul and Nalaikh, the associated socio-cultural and religious practices were generally not regarded as barriers to biomedical healthcare. Both caregivers and health workers perceived the role of the local healers to be quite separate from their seeking treatment at health facilities. Whilst biomedical treatment focused on the body, local healers often provided psychological support to families and were used to cure spiritual sickness. Respected healers also served as important sources of information and advice for pregnant women and mothers caring for ill children. A number of inherent risks were identified, however, in seeking care from traditional healers. Firstly, misdiagnosis can result in a child not receiving biomedical treatment but being presented to a local healer instead. Secondly, although related, is the potential for significant amounts of time to elapse between the onset or identification of symptoms and seeking appropriate care, particularly if the child is taken first to the local healer and biomedical intervention is further delayed.

Other socio-cultural barriers in Khuvsgul, as discussed by health professionals and the Darkhad shaman, involved lack of birth spacing and the heavy workloads of herder women (particularly during pregnancy),which were thought to contribute to poor overall health outcomes.

Knowledge and information barriers

In general, belief in the efficacy of biomedicine was widespread throughout Mongolia, and advice received from health professionals was seen to be valuable. The majority of mothers described their sources of health information to be the television, brochures or from the experiences and knowledge of other mothers. For herder women, the most common source of health information was the *bagh feldshers*. Most did not suggest the clinic or hospital as a source of health education. Primary caregivers perceived their lack of health knowledge to be caused by doctors neglecting to provide sufficient information and missing opportunities to enter into meaningful dialogue with their patients. Demands for more information regarding pregnancy, birth and newborn health were particularly strong amongst first time mothers who felt they had not received sufficient knowledge from their healthcare providers. Health workers in both Khuvsgul and Nalaikh confirmed that the trainings they gave for pregnant women were poorly attended unless incentives were provided, although caregivers suggested they were held at inconvenient times of day which precluded their attendance. Health workers also cited their own lack of knowledge as a barrier to providing appropriate information and optimal care to their patients. Midwives and nurses both indicated that they had few opportunities for refresher training, particularly in comparison to the doctors who worked in the same facility.

Health facility deterrents

Health facility deterrents were reviewed as five interrelated areas: environment; lack of medical equipment and drugs; perceptions of poor service provision; concern about misdiagnosis and distrust of prescription; and attitude of health professionals.

Environment: In Khuvsgul Province, extreme cold, lack of heating and lack of available water were problematic. The hospital's only source of fresh water was the lake. It had no central heating system, and relied on wooden stoves located in each patient room as the only source of heating. Lack of space and overcrowding also

challenged hospital environments in both regions. There were not always sufficient beds available, and recently delivered mothers often cited their frustration with the crowded conditions. The situation was exacerbated by ongoing construction, and both patients and maternity ward staff found the long-term renovations disruptive. Poor hygiene and unsanitary toilet facilities were also seen to be problematic.

Lack of medical equipment and drugs: Health professionals discussed the lack of essential medical equipment. In Khuvsgul, *soum* hospitals were underequipped to deal with obstetric emergencies or acute child illness and cold weather was liable to interrupt their drug supply chain. Caregivers discussed hospital stock-outs when they were required to buy equipment and medication thereby adding further financial burden to seeking biomedical care.

Perceptions of poor service provision: Biomedicine was generally held in high regard, although caregivers questioned the skill and competency levels of health professionals. This was particularly true at *soum* level but concern was also expressed about services provided at the referral hospitals in both Khuvsgul and Nalaikh. Some degree of patient concern appeared valid, however, and was reiterated by health professionals who concluded that their busy schedules, heavy workloads, and the lack of health staff, particularly skilled specialists, sometimes prevented them from following best practices. High staff turnover and the lack of incentives for new graduates to work outside the urban centres were frequently lamented by health professionals in both regions. *Bagh feldshers* in Murun concluded that young doctors who came to the areas often relocated quickly. Caregivers also perceived waiting times to be unnecessarily long, a fact reiterated by health staff.

Concern about misdiagnosis and distrust of prescription: Caregivers also expressed concerns about the skill level and professional competency of health professionals in terms of potential misdiagnosis and their resulting distrust of medication prescribed. Caregivers often became suspicious of a diagnosis if a child's condition did not improve as rapidly as they had expected or hoped. Such concern was evident in both Khuvsgul and Nalaikh and was reflected across all levels of service provision. Caregivers frequently admitted confusion and mistrust over the types of drugs prescribed to their children by the clinic. Caregivers' decisions about which prescribed medicine to give their children, were not only made in relation to cost, but also determined by their level of trust in clinic recommendations. A pharmacist interviewed at a large, modern and well-stocked pharmacy in Nalaikh confirmed her professional concerns about the drugs routinely prescribed to children.

Attitude of health professionals: Although provincial level hospitals were generally regarded as superior to *soum* hospitals, caregivers often criticised medical staff at the referral centre for being '*too bureaucratic*'. This term was used to refer to doctors who had a brusque manner, were critical of a mother's care, or who did not take the time to explain properly the condition or provide health information. Many caregivers claimed that health professionals displayed poor, uncaring or negative attitudes towards their patients and lacked effective communication skills. They confirmed that they had little knowledge of what procedures were being carried out or why whilst they were in hospital. In both areas, caregivers described ways in which health professionals favoured certain patients, such as allowing friends or relatives to jump the queue. In Nalaikh, however, other more concerning discriminatory practices were evident, particularly in relation to migrant women. These caregivers often found it difficult to access healthcare in an area different to that listed in their paperwork and were frequently chastised by staff for not having the correct documentation. Although a small number of interlocutors spoke Kazakh, language was not a barrier to healthcare access, as all participants communicated fluently in Mongolian using commonly understood vocabulary for child illnesses and newborn complications. Similarly, neither religion nor ethnicity were found to be the root cause of discrimination or stigma. Discriminatory practices mentioned by migrant mothers were based on accessing care in a district other than their own, rather than intrinsically linked to their ethnicity. All stakeholders were in agreement that ethnic discrimination was not a factor in the provision of health services

D – Solutions to barriers identified and drivers to care seeking

Having highlighted the barriers and deterrents faced by caregivers in seeking treatment for childhood pneumonia and diarrhoea and in relation to skilled birth attendance and newborn care, participants were also asked to share ideas and possible solutions to overcome the challenges identified. They were encouraged to consider what, from their perspective, would lead to the adoption of healthy behaviour and appropriate and timely care seeking for childhood illness.

Solutions to financial barriers

In theory, government health services are free at the point of service delivery in Mongolia. Despite this, financial outlay was often required for transport, small items of medical equipment and drugs from the public pharmacies that operated for profit outside the free governmental services. Caregivers found it difficult to envision how their financial constraints could be alleviated, beyond facilities providing medical supplies and medicines when necessary. In Khuvsgul, the *soum* hospitals provided free transport to the province hospital, but no participant suggested extending this service to return patients home as a solution to transport costs. In Nalaikh, pharmacists discussed the provision of subsidised medicines for qualifying families at four pharmacies in the town, yet no caregiver or health professional appeared to have knowledge of this. In Mongolia, the lack of women's economic empowerment was not an obvious financial barrier and was not discussed by participants.

Solutions to access barriers

Mongolia is a large country with a low population density. Linking disparate and nomadic communities with urban or peri-urban centres requires navigating long distances over difficult terrain. The challenge to effective coverage is exacerbated by the harsh weather conditions that quickly erode paved roads and prevent movement between areas. Car travel from *soum* centres to the remoter regions where herder families reside is often not possible, even in good weather. Improvements in access and coverage would therefore require huge investment in the country's infrastructure that is beyond the remit of the health system alone. Mongolians have developed coping strategies and use alternative modes of transport, such as horses, reindeer and, when possible, motorbikes. These modes of travel are also employed by the *bagh feldshers* who are tasked with providing healthcare to Mongolia's most difficult to access population.

It is unsurprising, therefore, that when asked how to improve healthcare access for herder families, 100% of respondents suggested increasing the capacity of *bagh feldshers* as the most obvious and reasonable solution. Increasing the capacity of *feldshers* to frequently visit pregnant mothers and families with ill children would increase the number of women's antenatal care visits, likely reduce the number of patients requiring hospitalisation (through preventative care and health education), and potentially lessen delays between symptom onset, recognition and intervention.

Solutions to socio-cultural and religious barriers

Healthcare professionals identified three potentially harmful socio-cultural practices: improperly dressing children for winter conditions; the intense work practices of pregnant women (particularly herders); and the use of Kazakh healers by Kazakh caregivers. The proposed solution to all three was succinct: increase caregiver education. Improving health education was seen to be a priority, but the inference made by health professionals was the need to first to improve women's overall educational status.

The need for health education to overcome socio-cultural and religious barriers focused mainly on practices related to traditional Kazakh healers. Although it was clear that obstetric complications required health facility attendance, visiting a healer for childhood pneumonia and diarrhoea could lead to incorrect diagnosis, mismanagement and delayed care seeking. Nalaikh health workers suggested that targeted health messages would help to overcome such practices.

Solutions to knowledge and information barriers

As discussed, the use of biomedical services (when accessible) was widespread throughout Mongolia for a variety of factors, not least the long history of socialist medicine. Adding to the discussion of how women's overall higher education levels would lead to healthier children, recommendations for health education activities focused on increasing the quality and quantity of promotional material, such as information brochures and the 'pink book'. Health professionals also suggested the use of visual communication methods to increase knowledge and awareness, and caregivers confirmed the efficacy of engaging visual communication materials. Whilst secondary sources of information were thought to be useful, caregivers emphasised that they should be used to supplement rather than replace direct communication between doctors and their patients. From the caregivers' perspective, solutions to improve the lack of information and health education provided at health centres focused predominantly on improving the counselling and communication skills of healthcare providers.

Several participants suggested increasing the capacity of *bagh feldshers* in their outreach activities with rural communities as a method for improving knowledge and information amongst herder communities.

Solutions to health facility deterrents

In relation to health facility deterrents, participants discussed improvements to three main areas: personal interaction and timings; environment and infrastructure; and clinical skills. In response to the harsh treatment caregivers perceived they received at health facilities, and the long waiting times, it was suggested that more highly skilled doctors be hired to lessen the heavy workload of existing hospital staff. Caregivers hoped that this would relieve staff of pressures that contributed to the poor attitudes of health workers. Caregivers also suggested methods for increasing the efficiency of clinic appointments, particularly for ANC and the treatment of child illness. One idea was to allocate appointments in advance to avoid mothers waiting in long queues, prevent discriminatory scheduling practices, and to enforce family doctor work schedules.

Health professionals discussed the need for the government to secure more realistic budgets for medical supplies and essential equipment, particularly at *soum* hospitals, to ensure facilities could appropriately treat newborn complications, pneumonia and diarrhoea. The need for improved infrastructure was emphasised in Khuvsgul to enable positive working environments with a reliable water supply and heating, rather than being dependent on thawing frozen lake water or costly expenditures on wood-burning stoves. Health staff in Murun general hospital also stressed the need for improved infrastructure. Completing construction quickly would avoid further disruption to services and provide an additional maternity waiting home to increase the hospital's capacity for caring for expectant mothers. *Bagh feldshers* and *soum* health staff both suggested better insulation of medicines during transportation, to avoid drugs being discarded due to freezing.

Increased training for family clinic staff, particularly in relation to prescribing practices for children under two was suggested by health professionals. Health staff also discussed the need for specialised doctors, and for the introduction of increased salaries and incentives to encourage qualified staff to be deployed in rural areas and districts outside Ulaanbaatar. It was acknowledged that many of these large-scale institutional issues were deeply entrenched and that solutions proposed were not necessarily feasible. Failure to address systemic challenges, however, was seen to be a significant factor in contributing to ongoing future problems.

Additional solutions

To supplement the solutions suggested by participants, a number of additional areas were identified by the research team during data analysis. In terms of increased access to medication, pharmacists in Nalaikh suggested that subsidised medicines were available from selected pharmacies. If the medicines were good quality and the supply was reliable, caregivers should be made aware of their availability to help overcome financial barriers. This warrants further investigation. Hospital vehicles (ambulances, clinic cars) used to transport patients to health facilities, should be maximised. Opportunities to return patients to their homes after treatment should be explored. With regards to outreach, the provision of frontline health services and key health education, *bagh feldshers* should receive training to advance their competency (such as paramedic skills) and to increase their capacity to deliver health services in operationally challenging circumstances. They should be supported with training in communication and counselling skills to enable them to provide health education at the community level. The timing of health education sessions held at health facilities should be more appropriate to the daily and seasonal schedules of the target beneficiaries. When, where and how health education is delivered should be contextualised by work commitments, cultivation times and nomadic patterns. Darkhad and Kazakh healers serve as important and trusted sources of health information, and would benefit from basic training that focused on appropriate and timely referral processes. Similarly, health professionals should be encouraged to have a better understanding of Kazakh and Darkhad healing practices to clarify any potential misunderstandings.

E – Technology use for behaviour change communication

Mapping the mobile landscape

There are four mobile service providers operating in Mongolia: Mobicom, Unitel, Skytel and G mobile. Skytel and G mobile also offer modem-based Internet services. Mobicom and Unitel have the largest customer base in both

Khuvsgul and Nalaikh. Unitel offered better service plans for making calls, as calls to other network users were free, whilst Mobicom had more attractive call receiving options. Several participants had two phones to take advantage of both service providers. There was good network coverage in urban and *soum* centres, but little or no reception in rural areas. Because of their capability to make and receive calls outside mobile coverage areas, G mobile 'home' phones with portable antenna were predominantly used in remote areas (although they were non-SMS capable). Anecdotal and observational data from mobile credit shop owners suggests that women are by far the largest customer base in both regions as purchasers of credit for themselves and their families.

Overview of current mobile health opportunities and constraints

In regards to qualitative data collection, all but one mother interviewed in Khuvsgul Province had a mobile phone for her personal use. In Nalaikh, all caregiver respondents confirmed they owned a handset. All healers, religious leaders and health professionals (bagh feldshers, maternity staff, family clinic staff) who participated in interviews and focus group discussions had personal mobile phones. The majority of respondents claimed to have used their phones to contact healthcare workers in the past, with direct contact in return most often received from vaccinators reminding mothers of a child's upcoming immunisation.

The results of the technology survey indicated that 41/45 respondents in Khuvsgul and 43/45 respondents in Nalaikh owned a mobile phone (93.3% overall). 60.7% of respondents used a prepayment system, with the most commonly purchased credit denominations being 1,000-2,000 Tugrik (0.60 – 1.15 USD). Over 97% of respondents had a mobile phone that was capable of sending and receiving text messages and 92.9% preferred text messages to phone calls. 75% of those polled texted their friends and families, with only 15.5% of respondents unable to type a text message.

Other technologies

Television: Television use was widespread in Mongolia, even rural herder families living outside *soum* centres often had televisions powered by solar battery. Several mothers, particularly first-time mothers, described watching health programmes targeted at expectant mothers. In Khuvsgul, 44/45 respondents to the technology survey watched television and 43/45 in Nalaikh. The most popular television channels included: Mongolian National Broadcasting (MNB); UBS; 25TV; TV5; TV9; SBN; NTV; and ETV. The most commonly watched television programs were: the news; Korean soap operas; films; and music programmes.

Radio – 74.2% of the survey respondents did not listen to the radio. Only 10/45 respondents in Khuvsgul and 13/45 respondents in Nalaikh listened to the radio. Of those who did, 39% tuned in daily, whilst 61% only listened once or twice per week. The most frequently listened to programmes were the news and weather forecasts. In general, participants did not connect listening to the radio with receiving health related information.

Internet – 61.8% of survey respondents did not use the internet. In Khuvsgul only 14/45 respondents used the internet and 19/45 in Nalaikh. The majority of users went online daily, usually in the afternoon, primarily to check their Facebook page, chat online or search for information. All websites reviewed were in Mongolian script. One first-time mother in Murun described frustration with not being able to locate health information related to pregnancy on Mongolian text websites.

Conclusion and recommendations

The formative research undertaken with caregivers and health professionals in Khuvsgul Province and Nalaikh District, documented new empirical data on preventable child deaths from pneumonia, diarrhoea and newborn complications in Mongolia. The research identified barriers that prevented communities from adopting healthy behaviours and best practices for timely and appropriate care seeking, and the positive motivations and triggers that contribute to an enabling environment and support communities to seek care.

The evidence generated through this research should be operationalised and used to inform programme design and communication strategies as UNICEF supports Mongolia in their pledge 'A Promise Renewed' to focus on under-served populations and end preventable child deaths. Key findings will be used as a platform for an in-country workshop to develop C4D strategy in 2014. In conclusion, five interrelated areas of intervention are highlighted and associated recommendations made.

1) Core areas for communication interventions

- In relation to pneumonia, it is recommended that communication interventions focus on issues of prevention and early warning signs. Related issues such as household pollution through burning solid fuels and personal smoking habits should also be incorporated. Integrated with strategies to improve community understanding of the links between pollution and health, remedial action would also need to include alternative options at the household level as long term solutions.
- It is recommended that communication interventions for diarrhoea focus primarily on issues of prevention. This will necessitate strategies to include key WASH messages, particularly hand-washing with soap at critical times, improved sanitation, and household water treatment and storage (HWTS) methods. The potential to use cleaned leaded gasoline containers should be explored. In addition, communication should target the widely held belief that children's faeces are cleaner than those of adults and therefore warrant less hygienic means of disposal.
- Among Mongolia's Muslim Kazakh communities, who may be bathing their infants too frequently in respect of Islamic practices, emphasis needs to be placed on delaying bathing practices, particularly for pre-term or low birth weight children.
- Socio-cultural practices regarding breastfeeding should also be addressed in relation to diarrhoea-related communication. The strategy should encourage exclusive breastfeeding and adequate maternal nutrition and should purposively address the concerns mothers articulated about low milk production, including practical guidance about how to breastfeed.
- With regards to biomedical intervention, two key messages should be developed. First, that caregivers should not self-medicate but rather should access professional health services; and secondly, that caregivers should administer the correct dose of medication.

2) Opportunities for the adoption and promotion of appropriate healthy practices and actions

- Improving the quality and quantity of health education at health facilities should be immediately actioned. Associated IEC and BSCC materials should be developed and implemented in the target areas, and, most importantly, health professionals should receive training in communication and counselling skills. Similarly, *bagh feldshers* should receive additional training to facilitate communication activities at both a household and community level during their outreach sessions. These sessions should incorporate caregivers (mothers, fathers, grandmothers etc.) and the wider community and should be promoted as interactive, fun and engaging events.
- The timing of health education and communication sessions should be carefully tailored to the daily routine of the target audience. The lifestyle of the population is heavily seasonal, with the winter months being an obvious period to invest in increased communication activities.
- Accessing mothers and providing health education at maternity waiting homes should be a key component of any communication strategy.
- Several mothers recounted sharing information with other mothers, and discussing health issues as a collective. Informal discourse and experience sharing should be facilitated in both a community and hospital setting and at maternity waiting homes.
- Opportunities for interaction and engagement should be facilitated in relation to community activities, such as the monthly collection of allowances by Reindeer families, or parents coming to *soum* centres to visit their children. Sessions could be used constructively to promote healthy practices and action, but also to gather information about the group and the health status of the community.
- Caregivers stressed that both print and visual media should complement and supplement face-to-face dialogue with health professionals.
- A final opportunity that must be highlighted, is harnessing local healers. Healers have high levels of access to and social agency with communities and are important figures in local pathways of care. They should be empowered to both adopt and promote healthy behaviour and to refer patients in a timely and appropriate manner when necessary.

3) The feasibility for introducing mHealth and other technologies

Initial findings indicated that it should be feasible to introduce mHealth in Mongolia. A high percentage of caregivers had mobile phones that they used for calls and also text messages. Phone credit was widely available in both urban and *soum* centres and service providers indicated that women were the majority of the customer base purchasing mobile credit for themselves and their families. It is difficult to assess, however, how receptive people would be with regards to adopting a new and potentially disruptive technology. In the abstract, it was challenging to determine the level of demand from caregivers or health professionals.

In relation to the use of mHealth and other technologies by health personnel, it may be useful to consider the use of low cost tablet computers for *bagh feldshers*. There have been several promising health technology initiatives that have engaged community health workers by providing them with low-cost mobile devices to show instructional videos and other visual media to primary caregivers. Some of the most promising mHealth applications that support community health workers not only deliver timely health education information, but also provide the capability to collate, track and monitor all routine RMNCH heath data, typically collected by 'mobile doctors'. Dristhi, the Smart Registry application system, has the potential to assist *bagh feldshers* and other community health workers with compiling current registers, collecting data and the timely reporting of health events. CommCareHQ is another positive mHealth option that could potentially increase the capacity of *bagh feldshers* in their outreach activities. This technology utilises SMS for data collection with Java enabled mobile phones (ideal for areas with limited wireless of 3G access), and automated text or voice message alerts reminding caregivers of appointments or providing timely health information triggered by upcoming events (such as pregnancy due dates).

In terms of the feasibility of introducing mHealth, one side of the equation not explored during the research was the technical capacity of the health system to support appropriate mHealth interventions. This would necessitate close collaboration with the mobile phone companies, at least initially, and for any intervention to be successful, appropriate resources and time must be allocated for both design, implementation and ongoing monitoring and evaluation. Given that many caregivers described having more than one phone in order to access preferable call and text rates, it would be critical to agree with service providers on a basic or standard option package to support mHealth. Beyond collaboration with corporates it would also be vital to actively engage with government Information Technology (IT) departments to gain further understanding of any current or potential eHealth and mHealth strategies employed. Equally important is the use of unique identification (ID) and health data standards (ie. computer protocols that allow health information to be extracted from one system and transported to another) to enable interoperability between systems. Unique IDs (such as National IDs) are important in tracking the same person across multiple health departments and/or other government services. In the context of Mongolia, this would be particularly important for tracking migrant populations in order to streamline healthcare services regardless of the district where caregivers reside and/or are registered.

4) Engagement of the private sector

Three potential partners from the private sector were identified to enhance child survival activities at both national and local levels. First, the dominant phone companies, Unitel and Mobicom. They were the largest mobile providers in Mongolia, were the most established and boasted the widest coverage. As partners, they could also provide valuable promotional opportunities raising awareness of key health messages through positive marketing. Their partnership would be required for the effective roll-out of any mHealth intervention. Aside from exploring partnerships with the telecos to provide mHealth support (eg. SMS data services), it may also be valuable to engage with them to share call detail records (CDR) of subscribers in the target areas. This would facilitate a better understanding of mobility patterns (useful for modelling the spread of disease or disaster affected populations), social interaction (the identification of geographical distribution of social connections in order to develop demographic profiles by age and sex to identify behavioural patterns) and economic activities (estimating average household incomes of anonymous subscribers).

In terms of partnering with a national media organisation, the National Broadcasting Channel was specifically mentioned as the best placement for health programming by multiple caregivers. In order to reach the largest number of primary caregivers, health programming should be routinely aired at a set time and date so that planned (rather than opportunistic) viewing can be arranged.

The third potential partnership identified was with private pharmacists. As trusted sources of health information they were often frontline providers of medicines, both prescribed and over-the-counter. They benefitted from

an established network and coverage that afforded them reach at the community level. Engaging with pharmacists would provide a unique opportunity to enhance a multitude of child survival activities.

5) Key advocacy issues

Representatives from the Ministry of Health, National Centre for Maternal and Child Health, National Centre for Communicable Diseases and UNICEF were asked to provide their views on key advocacy issues through which to elevate the priority of and resources for reducing childhood morbidity and mortality due to pneumonia, diarrhoeal disease and newborn complications Their responses were clustered around five main themes.

Policy and strategy: Policies should be evidence-based and resulting strategies clearly communicated to the public to ensure their necessary engagement. Overall, child health was not a government priority as reflected in the low level of direct funding, and raising the awareness of child health initiatives would mainstream their importance in political discussion. Cross-sector policies should also be developed.

Planning, management and coordination: Collaboration and effective communication were not always evident. Integrated programming was called for with improved coordination between sectors. Results-based planning and ongoing project management were seen to be essential if outcomes were to have leverage and create sustained momentum.

Human resources: It was emphasised that Mongolia's human resources for health are struggling to support an over-burdened health system, partly because graduates are reluctant to work in rural provinces. Stakeholders recommended that the quality of education needed to improve, with increased opportunity for practical as well as theoretical training. The possibility of introducing more attractive incentives was raised, but again issues of sustainability were cautioned. It was clear to the research team, however, that developing human resources for health and health workforce planning and distribution should be priority areas. Health workers require continual professional development, refresher training and on-the-job supervision, components that appear lacking in Mongolia.

Supply chain management: UNICEF and WHO are already focusing on supply chain management, but representatives stressed that ongoing assistance is needed. The Ministry of Health does not have its own drug storage facility, even for emergency drug stockpiling, and depends on private companies for drug distribution. Governmental budgets for healthcare should be need-based in order to meet demand, particularly for essential drugs including ORS, zinc and antibiotics, and cold chain management needs to be improved.

Political advocacy: Representatives urged advocacy to be targeted at politicians and policy makers more broadly, to secure increased political support for preventable child deaths. It was felt that political leaders lacked a good grasp of key issues and that they interpreted health issues in isolation, seeing them as being the remit of the health sector alone. It was suggested that key actors be taken to *soum* hospitals to meet with rural doctors and *bagh feldshers*, particularly during seasonal epidemics and times of high workloads. Individual advocates could then champion the need for increased resources to tackle child death.

Water ferry towards Renchinlkhümbe (Khuvsgul Province)

Contents

Tables

Photographs

Acronyms

ADB	Asian Development Bank
ANC	Antenatal Care
ARI	Acute Respiratory Infections
BCC	Behaviour Change Communication
C4D	Communication for Development
EAPRO	East Asia and Pacific Regional Office
EMoC	Emergency Obstetric Care
ENC	Essential Newborn Care
GPS	Global Positioning System
HMN	Health Metrics Network
HWTS	Household Water Treatment and Storage
IEC	Information Education and Communication
IERG	Independent Expert Review Group
IMCI	Integrated Management of Childhood Illnesses
IT	Information Technology
LMIC	Low and Middle Income Countries
MFOG	Mongolian Federation of Obstetrics and Gynaecology
MICS	Multiple Indicator Cluster Survey
MNB	Mongolian National Broadcasting
MoH	Ministry of Health
NMCHC	National Maternal and Child Health Centre
ORS	Oral Rehydration Salt / Solution
PDA	Personal Digital Assistants
SBBC	Social Behaviour Change Communication
SEM	Social Ecological Model
SMS	Short Message Service
UNICEF	United Nations Children's Fund
WASH	Water Sanitation and Hygiene
WHO	World Health Organisation

Glossary

Aimag	Province. There are 21 provinces in Mongolia.
Bagh	The third level administrative division in Mongolia. *Baghs* are a sub-division of *soums*.
Bagh feldshers	Local Mongolian term for rural community health workers dedicated to providing medical assistance to families living outside of *soum* centres. Sometimes also referred to as 'mobile doctors'.
Gher	Round portable home, also referred to as a yurt, a commonly used dwelling among nomad and herder families in Central Asia.
Khoroo	The second level administrative division, or sub-district, of the districts of Ulaanbaatar.
Soum	The second level administrative division in Mongolia. Mongolia's 21 provinces are divided into 329 *soums*.
Taiga	A wilderness area in far Northern Mongolia bordering Russia. Locally known as the homeland of Reindeer herders. The name Taiga is derived from the Ulaan Taiga mountain range that borders Russia.
Tsaatan	Alternate way to reference the ethnic group Tuvans, commonly referred to in Mongolia as Reindeer People.
Tugrik	Official currency of Mongolia. 1 USD = 1,714 MNT (Mongolian Tugrik, as of October 2013).

Tsagaannuur *soum* (Khuvsgul Province)

Introduction

Background

Successful interventions have been undertaken to advance countries towards their Millennium Development Goal 4 (MDG 4) – reducing child mortality. Since the inauguration of MDG commitments in 1990, child mortality has reduced globally by two-thirds through the implementation of coordinated interventions and outreach services to impoverished and marginalised communities. Within this overall context, progress has been significant. Yet 6.6 million children under five died in 2012, mostly from preventable diseases (United Nations 2013a).

Reaching MDG 4 will require further sustainable and measurable progress targeting the poorest and most vulnerable regions, namely sub-Saharan Africa and Asia. Statistical analyses suggest that the risk of death before age five depends predominantly on location: global, regional and local (United Nations 2013a).

Improvements in child survival at the regional level are evident, with Eastern Asia and Northern Africa at the forefront. These are the only regions that have already successfully met their MDG 4 goals (United Nations 2013b; United Nations 2013a). Importantly, Latin America and the Caribbean, South East Asia and Western Asia have reduced their under five mortality rate by more than 50% of recorded 1990 rates, while sub-Saharan Africa and South Asia have achieved reductions of 39% and 47% respectively. South Asia has made the largest absolute reduction in preventable child deaths, halving its number of under five deaths since 1990 (United Nations 2013a). Despite this achievement, nearly one in every three global deaths of children under five, occurs in this region (United Nations 2013a). Focusing on those regions where rates of child mortality remain high is, therefore, essential.

Of the 6.6 million child deaths that occurred globally in 2012, 17% were due to pneumonia and 9% to diarrhoea. Worldwide percentages of neonatal deaths have increased from 36% in 1990 to 43% in 2011. Data shows that a growing proportion of infant mortality occurs at or around the time of birth – a clear sign that child survival efforts must focus on the precarious first month of life (United Nations 2013a; IERG 2013). Regionally, Latin America and the Caribbean, the Middle East and North Africa, South Asia, and East Asia and Pacific accounted for more than half of neonatal deaths in children under-five years of age in 2012 (United Nations 2013a). Despite these regional successes in meeting MDG 4, the number of preventable child deaths remains high worldwide, with the burden of mortality heavily concentrated in the poorest locations, particularly among newborns (Bhutta and Black 2013).

Pneumonia and diarrhoea remain two of the largest killers of children under five and together with malaria account for one third of child deaths worldwide (UN Inter-agency Group for Child Mortality Estimation 2013; UNICEF/WHO 2013). Simple, inexpensive treatments are available for each of these conditions, yet too few children receive appropriate and timely care, particularly in high burden countries and in the most deprived settings due to a range of interrelated factors. By promoting basic yet effective practices such as breastfeeding, hygiene and safe drinking water many deaths can be avoided. These low-cost, basic interventions focus on the efficient use of already existing institutions and must optimise communication and coordination between related stakeholders (Kalita 2006; Parlato et al. 2004).

Significant national and sub-national progress can be achieved using these proven interventions: when integrated strategies are implemented and backed by relevant research, adequate economic resources, and political will, children's lives are saved (Shefner-Rogers 2013). This is the focus of 'Committing to Child Survival: A Promise Renewed', the global movement to end preventable child deaths that emerged from the Child Survival Call to Action convened in June 2012 (UNICEF 2013b).

An important component of this movement is Communication for Development (C4D). C4D is a systematic, strategic and evidence-based approach to promote dialogue at local, national, regional and international

levels in order to improve health indicators and encourage best practices. Its purpose is to implement timely, relevant and acceptable policies that drive positive social change for healthy behaviour. There are four core components to successful implementation of C4D: behaviour change communication (BCC); social change communication; social mobilisation; and advocacy. C4D strategy development is participatory, aiming to build capacity amongst relevant stakeholders and encourage community buy-in. C4D recognises that in order to be relevant and effective, health behaviour messages need to work on both an individual and collective, or societal, basis (Shefner-Rogers 2013).

Mongolia has signed the 'Promise Renewed' pledge that calls for a targeted approach to focus on under-served populations and the residual burden of preventable child deaths (UNICEF 2013b). Although Mongolia has reached its MGD 4 targets to reduce child mortality, there continues to be wide intra-provincial disparities. This formative research provides UNICEF and partners with a strong evidence base from which to develop robust but nuanced C4D strategies that will be implemented to further reduce the burden of pneumonia and newborn complications, the leading causes of child death in Mongolia.

Research brief and objectives

UNICEF East Asia and Pacific Regional Office (EAPRO) commissioned formative research to inform integrated programming on reducing preventable child deaths from pneumonia, diarrhoea and newborn complications in Mongolia. The research sought to define behavioural and social change outcomes by identifying a) barriers that prevent communities from adopting healthy behaviours and best practices for timely and appropriate care-seeking, and b) the positive motivations and triggers that contribute to an enabling environment and support communities to seek care.

Most of the existing information from Mongolia was limited to quantitative data from the Health Management Information System (HMIS) and Multi Indicator Cluster Surveys (MICS) and did not provide insights into access and participation issues of disadvantaged populations. Frequently, the thrust of communication campaigns has been on awareness raising for mothers, without understanding the role of significant others and the socio-cultural norms that may hinder or facilitate an effective translation of knowledge into practice leading to the desired outcome (in this case, child survival).

This formative research provides insights on three key areas:

- Barriers that prevent the adoption of healthy practices and timely care-seeking;
- Positive drivers that influence healthcare-seeking behaviour for childhood pneumonia, diarrhoea and newborn complications;
- Decision making processes associated with childcare and treatment seeking for childhood illnesses.

It therefore presents an evidence base to inform programme design and communication strategies and will determine:

- Core areas to focus communication interventions using community dialogue processes and other communication channels identified;
- Opportunities to enable caregivers, communities and healthcare personnel to adopt and/or promote appropriate healthy practices and actions;
- The social media landscape and the feasibility for introducing mHealth;
- Potential engagement of private sector organisations, social networks and the media in national and local interventions to enhance child survival activities at different levels;
- Key advocacy issues through which to elevate the priority of and resources for reducing childhood morbidity and mortality due to pneumonia, diarrhoeal disease and newborn complications.

Methodology

The research was conducted in line with prevailing ethical principles to protect the rights and welfare of all participants. Permission to undertake the research was granted by the Ministry of Health of Mongolia and supported by the UNICEF Country Office in Ulaanbaatar and the Provincial Office Murun.

Research team

The research team was led by the primary investigator, Dr Ginger Johnson (GJ), a Senior Research Associate with Anthrologica. She was supported by two UNICEF-Mongolia staff members, Odgerel Myagmar (in Khuvsgul and Nalaikh) and Zoya Baduan (in Nalaikh) who acted as research assistants and translators. The core team was supplemented by two members of staff from the National Maternal and Child Health Centre (NMCHC), Erdenechimeg Tumengur and Tuul Bayarsaikhan, who administered the technology questionnaires in both Khuvsgul and Nalaikh. Dr Juliet Bedford, the Director of Anthrologica, managed the project, contributed to each phase of the research and provided technical oversight.

Study sites

Based on composite indexes indicating multiple deprivations and drivers of inequity, government assessment concluded that Khuvsgul Province (rural area) and Nalaikh District of Ulaanbaatar (peri-urban) were amongst the most disadvantaged areas in Mongolia. Consequently, UNICEF-Mongolia has concentrated its in-country efforts on these two areas and the most at-risk communities. It was appropriate, therefore, that they be the target study sites for this research.

Specific field sites were agreed in collaboration with the UNICEF Country Office (see maps in Appendix 1). In Khuvsgul Province, three *soums* (administrative units) were visited: Tsagaannuur, Renchinlkhümbe, and Murun. Murun was accessed by internal flight from Ulaanbaatar, and onwards travel to the remote districts of Tsagaannuur and Renchinlkhümbe was by four-wheel drive vehicle. Nalaikh is one of the nine urban districts of the Mongolia's capital city Ulaanbaatar, and was reached by road. Data collection in both Khuvsgul and Nalaikh was carried out over ten days in October 2013 (see schedule in Appendix 2).

Khuvsgul Province is in the far northern region of the country and borders with Russia. It is characterised by alternating mountainous, forest and steppe landscapes and is often referred to in tourist literature as the 'Mongolian Switzerland'. It has a population of approximately 120,000 and Murun is the provincial capital. The general hospital in Murun treats an average of 1,900 children each year (of which 1,200 are under five) with the majority of these patients being referred from hospitals and clinics in the remoter *soums* of Khuvsgul Province. Between January and September 2013, two cases of maternal mortality occurred in the Province, one due to excessive bleeding, the other due to eclampsia. In the same period, there were 66 deaths of children under five.

Nalaikh District is an urban area surrounding Ulaanbaatar, located in Central Mongolia, and suffers from urban smog throughout the year. It has a population of approximately 37,000. During the course of this research, the District Health Department cited pneumonia and diarrhoea as the prevailing childhood illnesses in their catchment area. In the first nine months of 2013, they recorded that 17 children under the age of five died, including seven cases of newborn death. Although there is a lack of published documentation on this, health workers in Nalaikh suggested that increased rates of maternal and child mortality in the district were due to the large numbers of economic migrants who moved to the area for seasonal work in brick factories or in unsanctioned coal mines.

Participants and recruitment

Table 1 presents the interlocutors who participated in the research.

Table 1 – In-depth interview and focus group discussion participants and technology survey respondents

	Khuvsgul Province			Nalaikh District		
		No. of activities	No. of participants		No. of activities	No. of participants
Interviews	Primary caregiver	10	10	Primary caregiver	7	7
	Darkhad shaman	1	1	Kazakh imam	1	1
				Kazakh healer	1	1
				Pharmacist	3	3
Focus Group Discussions	Health professionals	2	11	Health professionals	2	9
	Expectant mothers	1	3	Mothers with hospitalised child	1	7
	Bagh Feldshers	1	12			
	Fathers	1	7			
Tech. survey	Primary caregiver	45	45	Primary caregiver	45	45
Total			89			73

The UNICEF office highlighted specific ethnic groups for inclusion in the research to provide a range of views, experiences, and religious practices of the target population. In Khuvsgul Province, participating communities included Darkhad, Reindeer (also known as Tsaatan), Khalkh and Khotgoid. In Nalaikh District, groups included Khalkh, Kazakh (Muslim minority group) and economic migrants. In total, there were 162 participants.

In Murun, the research team met with local health authorities from the Public Health Division, Children's Ward of Murun General Hospital and Dalai Elberel Family Clinic to gain a better understanding of the contemporary situation of maternal and child health in Khuvsgul Province. Health staff from Dalai Elberel Family Clinic used local clinical rosters to identify primary caregivers for in-depth interviews and technology surveys. Local health authorities and the UNICEF Country Office organised focus group discussions in Murun with *bagh feldshers* (rural community health workers), nurses and midwives from Murun General Hospital and expectant mothers at the Murun Maternity Waiting Home.

In Tsagaannuur, staff from the local hospital used local clinical rosters to identify primary caregivers for in-depth interviews and technology surveys, and participated in a focus group discussion of health workers (including nurses, doctors, vaccinators, and public health social workers). In Renchinlkhümbe, the research team worked with staff at the *soum* health centre to facilitate a focus group discussion with fathers of newborns and children suffering from (or having recently suffered from) pneumonia and diarrhoea. They also facilitated an introduction to a local Darkhad shaman for interview.

Nalaikh Health Department doctors and clinic managers informed the research team of the contemporary situation of maternal and child health in Nalaikh District and organised a focus group discussion with maternity nurses at Nalaikh General Hospital. Health workers at Suvarga Nalaikh Family Clinic identified traditional healers, religious leaders and primary caregivers for in-depth interviews and participated in a focus group discussion of health professionals. Team member Erdenechimeg Tumengur organised a third focus group discussion with mothers of children hospitalised for pneumonia and/or diarrhoea admitted to the paediatric ward of Nalaikh General Hospital. In Nalaikh, the research assistants independently recruited technology survey participants.

Primary caregivers of newborns and children suffering from (or who had recently suffered from) pneumonia and diarrhoea were purposively selected for interviews and focus group discussions in order to

capture their recent experiences of childbirth and/or child illness. In both Khuvsgul and Nalaikh, all the primary caregivers interviewed were mothers except for one grandmother in Nalaikh who cared for her grandson. The majority of mothers interviewed (particularly those caring for newborns) were likely to be living with or receiving childcare assistance from their own families (rather than from their in-laws). This was not always the case, however, and the term 'grandmother' is therefore used to refer to a child's paternal or maternal grandmother (unless stated otherwise).

In Khuvsgul Province, 11 in-depth interviews were conducted, ten with primary caregivers. The additional interview was held with a Darkhad shaman in Renchinlkhümbe. Five focus group discussions were conducted: with *bagh feldshers* (n=12); hospital staff in Tsagaannuur (n=6); fathers in Renchinlkhümbe (n=7); expectant mothers at Murun Maternity Waiting Home (n=3); and nurses and midwives from Murun General Hospital (n=5). Forty-five technology surveys were completed with primary caregivers of children under five including Khalkh (n=23), Darkhad (n=18), Khotgoid (n=2), Reindeer/Tsaatan (n=1) and Sartuul (n=1).

In Nalaikh District, 12 in-depth interviews were conducted, seven with primary caregivers. Because of the frequency with which participants described utilising local pharmacies, three additional in-depth interviews were held with local pharmacists in Nalaikh. One Kazakh imam and a Kazakh healer were also interviewed. Three focus group discussions were conducted: with staff from Suvarga Nalaikh Family Clinic (n=5); mothers with hospitalised children at Nalaikh General Hospital (n=7); and maternity nurses from Nalaikh General Hospital (n=4). Forty-five technology surveys were completed with primary caregivers of children under five including Khalkh (n=32), Kazakh (n=9), Uriankhai (n=1), Myangad (n=1), Torguud (n=1) and Sartuul (n=1).

All participants in both districts were given hand-washing soap and toothpaste to thank them for their time and contributions.

Data collection

Based upon a rapid review of published literature and programme documentation at the start of the research, GJ and JB devised a series of methodological tools including a topic guide that highlighted key issues and was the basis for the design of the semi-structured interview frameworks, focus group discussion frameworks and technology questionnaire. The tools included a broad spectrum of research questions and probes focusing on pneumonia, diarrhoea and newborn complications (see Appendix 3). UNICEF EAPRO, the Country Office and Ministry of Health authorities had oversight of the tools prior to their implementation.

Specific questions and probes were reviewed and refined during the research period in light of themes arising. Although the direction of each interview was determined by the interviewee and largely focused on issues they self-prioritised (rather than on what the research team may have presupposed to be important), the key topics were addressed in each interview and therefore allowed generalisation of themes across participants and districts. The research was deliberately designed to facilitate inputs from multiple stakeholders in a step-wise manner, so that issues raised by one group of interlocutors could be discussed with other groups of interlocutors to help the collation of in-depth material and the rigour of its validation and triangulation.

All interviews and focus group discussions were conducted by the English-speaking primary investigator with a UNICEF research assistant translating between English and Mongolian or English and Kazakh. Each interview lasted for approximately 60 minutes and each focus group discussion for approximately 90 minutes. Audio recordings were made using a digital voice recorder and, along with field notes, served as the basis for transcriptions.

Interviews were conducted at the home of the primary carer (with the exception of pregnant mothers at the Maternity Waiting Home or those currently admitted with hospitalised children) and with as much

privacy as possible. Focus group discussions were held in a municipal building (Murun), family clinics, *soum* health centres, province and district hospitals. The technology survey, administered to a different selection of participants than those enrolled in qualitative research, was conducted in participants' homes, community spaces, family clinics, and province and general hospitals.

At the start of each interview, focus group or technology survey it was made clear to all potential participants that their involvement was optional and voluntary and would not affect any future referral or medical service required or received by themselves or their children. The study's consent was presented, explained in detail and read aloud for illiterate participants (see Appendix 4). Informed consent was given by signature of all those participating. At the conclusion of the research, all consent forms have been retained by Anthrologica.

Data analysis

At the conclusion of each day of data collection, the primary investigator and research assistants would transcribe their notes and compile data for review and verification. Audio recordings of all interviews and discussions were transcribed into Microsoft Word by the primary investigator and reviewed by the appropriate research assistant for accuracy. Excel files inputting technology survey data were created daily by research assistants who then checked the spreadsheets against the original paper surveys. Preliminary analysis of qualitative and quantitative data was conducted throughout the data collection process.

The primary investigator presented initial findings to key UNICEF and Ministry of Health staff at a roundtable workshop at the conclusion of data collection. This workshop also addressed a set of policy-related child health questions devised by UNICEF EAPRO (see Appendix 5).

The primary investigator was responsible for all thematic analysis. Dominant themes were identified through the systematic review of interviews, focus group discussions and technology surveys. The occurrence and reoccurrence of salient concepts were labelled throughout and emerging trends were critically analysed according to the research objectives (Guest 2012; Bryman 2008; Ritchie and Lewis 2008). Coding and analysis was done by hand for qualitative data and through Excel statistical analysis for survey data. Computer-assisted qualitative data analysis software (ATLAS.ti) was used to analyse a sub-set of coded textual data to verify emergent themes.[1]

Methodological limitations

Each study site presented operational challenges. Accessing rural areas of Khuvsgul Province required significant travel time due to harsh road conditions and the complexity of housing in the urban areas of Murun and Nalaikh District (often without clear addresses) made locating target interviewees a difficult and time-consuming process. Given the limited time and resources available for the research, these challenges were reflected in the number of interviews or group discussions that could feasibly be completed during the ten days of data collection. Team members sought to minimise the impact of these constraints by employing a pragmatic methodology aimed at utilising resources efficiently in the targeted districts.

Risks associated with miscommunication or mistranslation were mitigated by each translator reviewing the transcripts created by the primary investigator. Sections of narrative were back translated to confirm or clarify participant statements. Transcripts were then cross-referenced with the research team's notes and any remaining areas of inconsistency highlighted for further clarification via an additional review of the original audio file.

[1] ATLAS.ti (Scientific Software Development) is a qualitative analysis package – originally developed to support grounded theory – distributed in the United States by SCOLARI, Sage Publications.

It is possible that interviewees expressed answers they perceived to be appropriate or socially desirable responses, although the candour with which the majority of mothers and health workers discussed their individual frustrations suggested such bias was unlikely. Observational data compiled during interviews in mothers' homes also served as a method of verification (eg. the existence of hand-washing stations and soaps, diaper disposal methods, etc.) Additionally, interview and discussion frameworks allowed similar questions to be asked in multiple ways in order to triangulate responses across relevant stakeholders.

Given the small sample size of the study, results cannot be extrapolated to a wider country context, although the saturation of findings from rural locations in Khuvsgul Province and the urban environment of Nalaikh District indicate this data is likely applicable to mothers living in similar rural/urban locations of Mongolia. The findings were broadly corroborated by the literature reviewed.

Report structure and outputs

This research confirms previous findings and provides important new empirical data that contributes to understanding local barriers to newborn care and the treatment of childhood pneumonia and diarrhoea in Mongolia. By exploring complex issues regarding child health, this report is designed to be of operational use to UNICEF and its partners at local, national and international levels.

The report presents a rapid review of the published literature and relevant policy and programmatic documents. It then outlines the demographic details of the primary caregivers interviewed and subsequently has six main sections: theories of causation, symptom recognition and prevention; care-seeking behaviours and practices; barriers to care seeking and treatment; solutions to barriers identified and drivers to care seeking; technology use for behaviour change and communication; and conclusion and recommendations.

Prior to its completion, UNICEF and key stakeholders were given the opportunity to provide written and verbal feedback that was incorporated into the final report as appropriate.

The findings of this formative research should be used as a platform for the in-country workshop to develop C4D strategy in 2014. In addition to the report, a complementary Powerpoint presentation has been designed that orientates results around the Social Ecological Model in order to identify behavioural and organisational points to leverage C4D activities (see Appendix 6).

Reindeer herder, Reindeer camp outside Tsagaannuur *soum* (Khuvsgul Province)

Literature review

Mongolia is on track to achieve MDG 4 nationally, but at the sub-national level, 10 of the country's 21 provinces lag behind due to insufficient and inefficient health services (UNICE 2012a). Pneumonia and newborn complications are the leading causes of child death in Mongolia. The proportion of child deaths due to acute respiratory infections and diarrhoea has fallen, although they are still among the major causes of mortality, and neonatal deaths and injury have increased proportionally as a result (MoH/HMN 2008). From 1990 to 2010, the infant mortality rate and under-five mortality rate declined significantly from 107 deaths to 32 per 1,000 live births (WHO 2012). However, pneumonia (18%), and diarrhoea (7%) account for 25% of under-five mortality, whilst newborn deaths account for 42% of the total infant mortality rate in Mongolia (WHO 2012). There are rural-urban differentials, and great disparities exist on the basis of socioeconomic status, with higher rates of maternal and infant mortality persisting amongst the rural poor.

Since the end of the Soviet era in 1990, Mongolia stopped receiving developmental and healthcare assistance as one of the Eastern Bloc satellites (Ebright et al. 2003). Following this major political change it was evident that women and children were particularly vulnerable to political-ecological shifts (Janes and Chuluudori 2004). This trend has been perpetuated, especially for rural, remote communities and those with a lower socio-economic status (UNICEF 2013a; UNICEF 2012b; Desbarats 2002). Whilst Mongolia has twice the number of hospitals than other transition countries in the region, the health workforce capacity is poorly distributed, and effective care is further limited by inefficiencies in service delivery and financing paired with outdated infrastructure (Lhamsuren et al. 2012; WHO/MoH 2012). These findings were emphasised in the recent bottleneck analysis by UNICEF, focusing on the causes of the disparities and strategies for healthcare investment (UNICEF 2012a),

Since 2012, UNICEF has collaborated with the local governments of Khuvsgul Province and Nalaikh District of Ulaanbaatar. Previous research and published literature on child illness and mortality in Mongolia had focused mainly on urban and peri-urban areas, and little qualitative data could be identified that related to more rural areas, including Khuvsgul. Nevertheless, trends in knowledge, attitudes and practices have been explored countrywide and, where possible, the following review focuses on the two target districts.

Healthcare system under-resourcing

Prior to the dismantling of the socialist system, Mongolia had built an accessible and rationally distributed healthcare system (Janes and Chuluudori 2004). The 'collective nature' of the socialist economy allowed women to divert their household labour in order to seek healthcare, including often-lengthy stays in maternity waiting homes, which had been established in nearly all Mongolian provinces by the 1980s. Today, the Mongolian government spends only 3% of gross domestic product on healthcare and although foreign donor agencies have invested in infrastructure, they have largely resisted investing in rural communities (Ider et al. 2012). Janes and Chuluudori (2004) conclude that, without wishing to romanticise Soviet rule, 'it is clear that the [socialist] social protections provided households and individuals far more health, economic and social security than are now afforded under the new capitalist system'. Although most family doctors in Mongolia are women, subsistence insecurity and the disordering of traditional social relations has marginalised women and children in the restructured and under-resourced healthcare system (UNICEF 2003).

The financial challenge Mongolia faces should not be underestimated as it seeks to develop self-sufficiency and deliver modern healthcare to its citizens, a relatively young and growing population (Ebright et al. 2003; Otgonjargal et al. 2012). 99% of deliveries are facility based, and 99% of births have a skilled attendant present (Baigalmaa et al. 2010), yet the level of preparedness for emergency obstetric care (EmOC) and essential newborn care (ENC) remains low (MFOG 2010). Many district hospitals lack the most basic items including thermometers, soap and sterile gloves. Whilst maternal and child health is fully subsidised by the government, mothers are frequently required to pay service fees due to budgetary

constraints and to privately purchase materials (diapers, gloves, masks, needles and medication) to compensate for the 'limited resources' that are publically available (Ider et al. 2012). Low-performing provinces receive reduced funding for maternal and child health services and the government's investment in health is heavily skewed towards secondary and tertiary care rather than primary preventative care (UNICEF 2013a).

In urban and central settlements, research has documented increasingly critical patient attitudes towards the quality and efficiency of health services. According to a Ministry of Health and UNICEF study, one third of urban women were critical of healthcare services, compared to a quarter of women using *aimag* (province) health facilities, and only one tenth of women using *soum* health centres (MoH/UNICEF 2000). Such disparities were also evident in hospital infrastructure. All hospitals surveyed in urban centres had running water and over half had a 24-hour supply of electricity. In contrast, only 38% of hospitals surveyed in the regions were connected to a central water supply and all *soum* hospitals used water from protected wells or springs, with one forced to melt ice. Facilities with centralised sewage systems were often unable to make use of their water supply during winter due to frozen pipes. As a result, hygienic practices could be compromised in *soum* hospitals and both patients and medical personnel had to use pit latrines located outside the main hospital building.

Although hospitals at all levels had a shortage of doctors and midwives to offer safe delivery services, the ratio of doctors per 10,000 population in Ulaanbaatar was 1.5 times greater than the ratio in rural areas (WHO/MoH 2012). Mongolia's 2008 health information system assessment report stated that 'rural health facilities, *soum* and inter-*soum* hospitals in particular, are experiencing critical shortages of doctors and other health professionals, which leaves almost 40% of the population without adequate access to primary healthcare' (MFOG 2010). Health workforce security is weak, with low wages, harsh working conditions and lack of proper incentive packages negatively affecting productivity and professionalism. Although the government offers fiscal incentives for specialist doctors to work in rural areas, many do not want to, particularly as the incentives and wage are insufficient to balance the high rate of debt many medical students incur during their studies (*ibid*).

The urban-rural divide

Disparity in maternal and child health between rural and urban areas is stark, with rural and poor children having a twofold increase in mortality (UNICEF 2012b) and significantly higher rates of stunting and wasting (Otgonjargal et al. 2012). This gap is widening with 'rapid social and economic transformations creating adverse effects in health among the poor' (UNICEF 2013a). The result of a survey conducted in 1997 by the Women's Information and Research Centre on women's economic status during the Soviet transition period indicated that rural women's workload increased by three to four hours per day compared to that in the centralised economic planning period (MoH/UNICEF 2000). Also, government allowances for childcare are unevenly distributed amongst mothers, causing scarcity of resources and time for rural families needing to seek healthcare. Mothers not covered by social insurance (such as the unemployed, mothers employed in the private sector and students) are legally provided allowances for four consecutive months, but the accorded amount falls below the standard level of living and does not go far to meet their needs (*ibid*).

In general, households were found to show a greater awareness of symptoms, be quicker to seek medical assistance and were less likely to engage in hazardous health behaviours with increasing wealth (MoH/UNICEF 2000). According to Baigalmaa et al. (2010), care-seeking behaviour for diarrhoea was 15% higher amongst wealthier households and hygienic conditions varied across wealth quintiles: 82% of urban homes had a designated hand-washing place, compared to 43% of rural households; 66% of urban homes had improved sanitation facilities, compared to 36% of rural households.

In a 2000 report by the Ministry of Health (the most recent data available) it was found that around one third of sewage treatment facilities were not functioning, and a further third were only in partial operation (MoH/UNICEF 2000). Millions of cubic meters of untreated sewage were being dumped, and this was found

particularly to affect children, whose customary role it was to fetch water. Insufficient and unsafe water, poor sanitation, and inadequate hygiene practices were the main causes of diarrhoea among children (Desbarats 2002). Whilst the main indicators of the national programme on environment health, 2011-2015, focus on acute respiratory infections (ARI) and diarrhoeal disease, the linkages with the child survival strategies are weak.

The only indicator suggesting better practice in rural rather than urban areas was breastfeeding, both immediate breastfeeding after birth and exclusive breastfeeding during infancy. Rates of exclusive breastfeeding were found to be 10% lower in urban areas (UNICEF/WHO 2013) and the percentage of children who were breastfed immediately after birth decreased with the increase of household wealth level (Baigalmaa et al. 2010). Although most women considered it appropriate to breastfeed children up to the age of two years or more, there also existed a commonly-held view that a child who has been breastfed for a long period was sluggish in weaning (MoH 2007). This may have contributed to mothers weaning their child early or abruptly. Diarrhoea prevalence peaks during the weaning of breast milk and the introduction of complementary feeding, more heavily affecting children under 23 months of age (*ibid*).

Interactions between caregivers and health professionals

According to Chultem (2009), doctors displayed different attitudes towards patients of different socio-economic status, hastened by the advent of privatisation and problems of 'significant discrimination' due to social class and ethnic group (MFOG 2010; UNICEF 2003). Chultem's study of women's caregiving experience in an Ulaanbaatar hospital found that the quality of treatment correlated with the ability or willingness of the patient or family to provide gifts to the staff. According to the Survey on Family Income and Expenditure 2003, families spend 3% of their healthcare expenditure on gifts for hospital staff. A 2010 survey conducted by the Mongolia Federation of Obstetrics and Gynecology and Wellspring NGO found that patients attending three hospitals in Mongolia (out of 21 sites surveyed) were asked to make a donation to the facility prior to receiving services. According to a caregiver interviewed by Chultem (2009),

> *We Mongolians have a bad habit: we always give something to the nurses or doctors. If you gave a thermostat of tea with a kilogram of pastry to a nurse, she will treat you better. Maybe she will give you one more injection, which was necessary, or if you request something, she may give it to you more quickly, something like that*.

In their study of provider attitudes towards parental involvement in decision-making, McAdams et al. (2013) also found that socio-cultural factors such as low income could decrease the willingness of staff to provide comprehensive advice or counselling. While most providers (67%) indicated that parents should be counselled about neonatal resuscitation in the event of a premature delivery, only 17% actually counselled the parent prior to the birth of an at-risk infant, displaying a discrepancy between the perceived value of parental involvement and the actual practice of neonatal resuscitation-related counselling (McAdams et al. 2013).

Baigalmaa et al. (2010) found the rate of Caesarean sections in Mongolia to be relatively high at 21% of births, significantly above the WHO recommended level of 5 to 15%. In Khovd *aimag*, in the Western region of Mongolia, the rate was as high as 50.6% of births. It was unclear what percentage of Caesareans were elective or through obstetric complication, or the degree of autonomy that women had over their choice of delivery method. Baigalmaa et al. (2010) concluded that wealthier women, particularly those in Ulaanbaatar, were twice as likely to receive a Caesarean section than women from the poorest households.

Perceptions of doctor-patient relations, particularly issues of communication and the sense that doctors lacked responsibility, were found to reduce the likelihood that caregivers would routinely interact with medical staff (MFOG 2010; MoH/UNICEF 2000). Togoobaatar et al. (2010) studied 540 households that included at least one child under five years of age in Ulaanbaatar city. According to their sample, reasons for not seeking a physician included the perception that the illness was not severe (70%) and that the

doctor always prescribed the same antibiotics for similar conditions (15%). As a result, use of non-prescribed antibiotics was 'widespread and often inappropriate' in the treatment of conditions such as viral upper respiratory tract infections and non-specific diarrhoea (Togoobaatar et al. 2010). Most respondents in this study held incorrect beliefs about the efficacy of antibiotics in treating health problems, but used antibiotics for themselves and their children because they considered themselves knowledgeable about antibiotic use based on past experience. This contrasts literature from other transitioning countries in which cost is cited as the main reason for self-medication.

Informal discussions with health professionals during this research indicated their perception that generic drugs procured through local bidding practices were not effective and often did not comply with standards of Integrated Management of Childhood Illness (IMCI). Healthcare providers suggested that named brands were seen to be the most effective treatment option (and certainly the more expensive option). Recent studies concluded that many drugs sold in Mongolia are counterfeit, substandard or unregistered. Results from a recently completed study funded by the Asian Development Bank, found that from 388 samples of nine different medicines, 21.9% were unregistered drugs and 13.4% were graded 'not acceptable' (Khurelbat et al. 2013a). Of the 95 pharmacies in four districts of Ulaanbaatar included in the study, 95.9% were found to be selling at least one substandard drug. Frequently sold substandard drugs included amoxicillin, paracetamol and ibuprofen (Khurelbat et al. 2013b). Evidence suggests that antibiotics are being overused in Mongolia, with family members' advice taking precedence over the advice of pharmacists and doctors (Togoobaatar et al. 2010). Ider et al. (2012) found that to counter the prevalence of self-medication, doctors tended to prescribe the strongest and consequently most expensive antibiotic. This perpetuates the cycle of delayed care seeking until the illness has progressed, with the associated cost of care increasing as a result (UNICEF 2013a).

Non-financial access barriers

The literature illustrates that Mongolia's geography has a huge effect on both the availability of treatment and the local health practices of caregivers. Baigalmaa et al. (2010) demonstrated that the western region lagged behind other areas across several indicators of child health: only half of all caregivers in the western region immediately started treatment for diarrhoea; 64% of children were breastfed for the first time within one hour of birth (as compared to 80% in Khanghai and Eastern regions); and the Western region also had a high proportion of infants with a low birth weight (7%). Children living in isolated geographical areas suffered from cumulative inequities as access to reliable healthcare was diminished (UNICEF/WHO 2013; MoH/UNICEF 2000).

Location and distance to health services was also problematic for maternal health. According to the Mongolian Federation of Obstetrics and Gynaecology (MFOG), there was at least one basic EMoC facility for a *soum* population of 1550 (minimum) to 6040 (maximum), and *aimags* had at least one comprehensive EMOC facility for a population of 60,000 to 80,000, far exceeding the minimum UN recommendation level (MFOG 2010). However, long distances, the harsh climate, poor road networks and lack of infrastructure were all barriers preventing timely access to delivery services. Of the health facilities included in the MFOG survey, only Nalaikh district hospital had the capacity to provide an ambulance service upon request. Up to 60% of the emergency requests made to facilities were related to obstetrics, but 76% of the assessed health facilities did not have the financial resources for the maintenance and repair of vehicles and ambulances. Staff referred to traffic jams, confusion over addresses and late calls from mothers in distress as being problematic for the ambulance service, and this resulted in Ulaanbaatar having a disproportionately large number of home births in comparison to the rest of the country (116 out of 141 home births in 2007) (MFOG 2010). The MFOG found that 58% of *soums* were located more than 120 kilometres away from their nearest *aimag* centre, making it difficult (if not impossible) to deliver emergency care within two hours (MFOG 2010).

Knowledge, attitudes and practices

Attitudes and practices of health professionals were found to account for some differences in health outcomes. Studies showed that infection control policies, if they existed at all, were given little support by hospital management (Ider et al. 2012; Ider et al. 2010). Despite having incinerators, 38% of surveyed facilities buried placenta and blood-derived waste, most likely for cultural reasons, and there were persistent disparities between theory and practice. Of staff interviewed in the MFOG survey, 88-94% discussed hand-washing, but a lesser percentage were observed to perform hand-washing during delivery. The level of knowledge about emergency obstetric care procedures also varied between site and specialist (MFOG 2010).

Baigalmaa et al. (2010) found that only 1% of mothers with children under five years had knowledge of the main danger signs for suspected penumonia, and knowledge and understanding of cultural practices relating to pneumonia risk was low. Environmental concerns were linked to high rates of pneumonia. Mongolia is one of only 17 countries where leaded gasoline is still legally available and 68% of households were found to use solid fuel for heating and cooking purposes (Allen et al. 2013). Studies have shown that children exposed to unprocessed solid fuels were nearly twice as likely to contract pneumonia as other children (UNICEF 2012b). According to UNICEF the percentage of households using solid fuel in rural areas soared to 90%, in line with the burden of pneumonia that was increasingly concentrated in resource-poor areas (*ibid*.) In addition, the prevalence of smokers in Mongolia was 28% (MoH/HMN 2008).

Ulaanbaatar remains one of the most polluted capital cities in the world, with an estimated 1,000 to 1,500 premature deaths per year resulting from outdoor air pollution (Guttikunda et al. 2013). The annual average concentration of particulate matter is more than seven times the World Health Organisation's air quality guidelines and represents a major threat to public health (Allen et al. 2013). The single biggest producer of pollution in Ulaanbaatar is coal and biomass combustion in households (Guttikunda et al. 2013), and much of the population growth has been in the low-income *gher* areas that burn coal and wood for heat, representing a substantial health risk for indoor air quality (a *gher* is a round portable home, also referred to as a yurt, commonly used among nomad and herder families in Central Asia). A qualitative study of attitudes towards stoves and their effects on health showed that all participants recognised the respiratory symptoms caused by smoke, but lacked of knowledge about the effects of this smoke in causing disease (Gordon et al. 2007). The prevailing attitude was that the smoke caused short-term irritation such as coughs and painful eyes, but that such negatives were vastly outweighed by the simple need for warmth. A recent air quality survey conducted in Mongolia indicated that *aimag* centres, particularly during winter months, were becoming increasingly polluted through a combination of household and environmental pollutants such as particulate matter, nitrogen and sulphur oxides and carbon monoxide (ADB 2008).

Gombojav et al. (2009) concluded that delays in seeking medical care for acute respiratory infections in infants (more than three days from the onset of symptoms) was associated with younger maternal age, single-child families, absent father and residence more than one kilometre from a clinic. Evidence has consistently shown that the seeking care is contingent on a mother's individual characteristics, household demographic characteristics and family/community support. In Mongolia, key determinates for women's access to health services include her socioeconomic status, education and knowledge level, autonomy, community perceptions of health, and the availability of accessible healthcare services (Kalita 2006).

In general, Mongolian women occupy a lower status in society and uneducated and unemployed women are less able to demand and exercise their health and reproductive health rights (MoH/UNICEF 2000; Gan-Yadam et al. 2012). According to the MFOG study (2010), most mothers in Ulaanbaatar gained their information on maternal and newborn health from TV and radio (22%) and Gan-Yadam et al. (2012) found that caregivers who used the internet, listened to the radio and read magazines had a higher capability for self-assessment of health. Again, this was influenced by the urban-rural divide as rural women had less access to mass media (exposure was lowest in the Eastern and Khangai regions at 13%) and were therefore likely to seek advice from health workers more frequently than gaining information from TV, radio and newspapers.

Darkhad shaman, Renchinlkhümbe *soum* (Khuvsgul Province)

Demographic details of primary caregivers

Table 2 – Compiled demographic details of primary caregivers interviewed

	Khuvsgul Province (n=10)		Nalaikh District (n=7)	
Relation to Child	Mother	10	Mother	6
			Grandmother	1
Ethnicity	Darkhad	2	Kazakh	2
	Reindeer	2	Khalkh	2
	Khalkh	4	Migrants	3
	Khotgoid	2		
Age range	Mothers (years)	23-38	Mothers (years)	20-35
			Grandmother	58
Children in care	Number of children	1-4	Number of children	1-4
Religion	No religion	4	No religion	4
	Buddhist	4	Islam	2
	Shamanism	2	Shamanism	1
Education level	No education	-	No education	1
	Primary	2	Primary	0
	Secondary	4	Secondary	5
	Tertiary	4	Tertiary	1
Monthly income	Tugrik	40,000-1,300,000	Tugrik	40,000-550,000
	USD	23-758	USD	23-321
Most recent child sickness	Pneumonia	1	Pneumonia	1
	Diarrhoea	3	Diarrhoea	2
	Pneumonia and diarrhoea	2	Pneumonia & diarrhoea	2
Newborns	No. of interviewees	4	No. of interviewees	2

Seventeen in-depth interviews were conducted with the primary caregivers of children currently or recently suffering from pneumonia or diarrhoea, or mothers of newborn children: 10 mothers in Khuvsgul Province; six mothers and one grandmother in Nalaikh District.

In Khuvsgul Province, four Khalkh, two Darkhad, two Reindeer and two Khotgoid mothers were interviewed. In Nalaikh District, two Kazakh mothers, two Khalkh mothers, two migrant mothers and 1 migrant grandmother were interviewed. In Murun (Khuvsgul Province) one interview with a Khalkh mother included her mother as joint interlocutor and in Nalaikh, the interview with the migrant grandmother included her husband (the child's grandfather) as joint interlocutor.

Mothers interviewed in Khuvsgul were aged between 23 and 38 years and mothers in Nalaikh were aged between 20 and 35 years. The grandmother interviewed was aged 58 years. They each cared for between one and four children. Nine mothers in Khuvsgul were married and one mother was single (never married). Four mothers and one grandmother in Nalaikh were married and two mothers were single (never married).

Across both districts, eight primary caregivers indicated they had no religion, three practised Shamanism, four were Buddhist and two were Muslim. With the exception of two Muslim mothers (both Kazakh) in Nalaikh, all interviewees responded that if a religion was present in their family life, it was not strictly followed (eg. 'soft' Buddhist).

Education levels appeared to be slightly higher in Khuvsgul than Nalkaikh. In Khuvsgul, two mothers reported to have attended primary school (to different levels), four had attended secondary school (to different levels) and four were enrolled in or recent graduates of university training. In Nalaikh, one mother

reported to have received no schooling, four mothers and the grandmother interviewed had completed some level of secondary school and one mother was a university graduate.

Income levels were highly variable across both districts with differences in ethnicity, employment of the husband and education level of the mother accounting for the majority of reported higher income ranges.

In both Khuvsgul and Nalaikh the research team interviewed four mothers currently caring for children with pneumonia and diarrhoea, two mothers of children with pneumonia, five children with diarrhoea, one newborn with pneumonia and five mothers of newborns.

Theories of causation, symptom recognition and prevention

When asked about common illnesses affecting Mongolian children, the majority of caregivers in Khuvsgul responded that cold and flu-like symptoms were the most common, particularly in the winter seasons. This finding is consistent with the frequency with which mothers would discuss cold weather as the cause of their child's illness. Discussions with *bagh feldshers* also indicated that respiratory diseases occurred more often among children due to extreme cold temperatures during the winter. Other illnesses mentioned, in descending order of caregiver recognition, were: diarrhoea, pneumonia, and hypoxia. Childhood deaths were perceived to be uncommon, but were most often attributed to diarrhoea and vomiting. One mother suggested that illness onset occurred after children began kindergarten, explaining '*If [they were] at home, they would not be sick as often*'. Similarly, health workers at Tsagaannuur hospital stated that the incidence of diarrhoea would increase when children were attending kindergarten as the chance of being exposed to other children's illnesses increased. Despite recognition of other conditions, the majority of participants described pneumonia as the primary illness to affect their children, with cold weather most frequently identified as the cause. As one mother concluded, '*It reaches minus 50 degrees Celsius here in winter – it's a very cold place*'.

In Nalaikh, cold and flu-like symptoms, pneumonia and diarrhoea were described with equal frequency by primary caregivers. Seasonality of illness was not as pronounced as in Khuvsgul with one mother stating, '*In the past we would have flu rarely in the warm seasons, but nowadays kids have it often even in summer time*'. This finding is consistent with the frequency with which caregivers in Nalaikh would describe air pollution (irrespective of seasonality) in addition to cold weather as the cause of their child's illness.

Although less frequently reported, 'other' respiratory diseases and throat problems were also mentioned by caregivers. To this list of common child illnesses, health workers in Nalaikh added asthma as a major concern due to air pollution in the district and smoking indoors.

Pneumonia

Across all ethnicities and locations, the Mongolian word *khatgaa* was the most common term used to refer to pneumonia. Although they more frequently used *khatgaa*, Kazakh women also adopted the Kazakh terms *chitpe* and *zerten* in reference to pneumonia. Pneumonia was commonly attributed to cold weather and the progression of a cold or flu to more serious symptoms. Caregivers reported episodes of pneumonia as '*a consequence of flu and cold that continued for a long time untreated*'.

In Nalaikh District, the addition of air and environmental pollution as a common cause of children's respiratory illness was emphasised by both caregivers and healthcare professionals. As one interlocutor explained,

> *Although we are located far from UB, we have a lot of air pollution here in Nalaikh. Coal stoves pollute the air a lot. Gher pollution is increasing in this area as migrants come from rural provinces. Also environmental pollution of soil is a serious issue. In some yards people dig latrines in one place and they are not pumped out. When this becomes full we cover it with dirt and dig another. So in one yard there can be 30-40 years of old latrines.*

The level of knowledge about pneumonia symptoms, progression and prevention was elevated amongst mothers of children who had experienced pneumonia. In general, women's ability to recognise the symptoms of respiratory distress was quite high. In interviews and focus group discussions, mothers frequently cited the following as symptoms of childhood pneumonia: difficulty breathing/pain in the chest/harsh sounds coming from chest; high temperature; vomiting thick yellowish substance; children crying more than normal; loss of appetite; and coughing. The duration of coughing symptoms was often

reported to be extended (over a period of several months), with the cough and harsh sounds from the chest getting progressively worse until treatment was sought. Then symptoms would often subside for a few weeks before returning again. In comparison, fathers listed only two symptoms of children with pneumonia: chronic coughing and high fever.

Four mothers stated they had '*no idea*' how to prevent children from contracting pneumonia. The most commonly cited method of prevention by other mothers was to keep children warm and to keep clothes on the baby. Additionally, caregivers suggested that pneumonia could be prevented through the proper use of biomedical drugs, a healthy immune system, avoiding sudden temperature changes (such as from moving from inside to outside the family home), preventing children from getting flu, and avoiding people who are coughing. To this list fathers added '*giving children more dairy products*' as a potential way to prevent illness.

Fathers and *bagh feldshers* also described the need to support children's immune system with healthy foods and vitamins, and to keep them warm as priorities for pneumonia prevention. *Bagh feldshers* openly discussed their frustration with families they perceived as failing to keep their children warm.

Some children wear very light clothes in cold weather. I don't understand how we increase this knowledge. How we make them [parents] care. Some parents care for their animals better than their children. They leave their kids at home and herd their animals… We tell parents to put warm clothes on their babies, we try to persuade them to take better care of their children. We don't know how to improve parents' health seeking behaviour, improve their attitude towards parenting and improve their knowledge on raising children healthily.

Health workers at Suvarga Nalaikh Family Clinic suggested breastfeeding as a potential preventative strategy for pneumonia morbidity reduction. They described high rates of breastfeeding among Mongolian women, yet perceived them to have lower milk production than in previous years (discussed further in the section 'Birth practices and newborn care' below).

Mothers also discussed their belief that the severity of pneumonia symptoms would progressively worsen without biomedical treatment and/or drugs purchased from private pharmacists. *Bagh feldshers* admitted their confusion over the presentation and severity of pneumonia from season to season.

The types of viruses causing respiratory infections are changing every year. In some years it takes a longer duration for kids to get pneumonia, perhaps some six to seven days. But last year, only after two days of catching flu or cold, children were diagnosed with pneumonia. Maybe viruses change and we need to have increased knowledge on this.

Diarrhoea

Across all ethnicities and locations, the Mongolian words *suulgalt* and *guilgelt* (more informal) were the most common terms used to reference diarrhoea. Although they understood and used these terms, Kazakh women also referred to diarrhoea as *ish jugirtu* and *ish auru* in the Kazakh language. These terms referred to 'stomach related illness' in general.

Caregivers were less confident in reporting the causes of diarrhoea than pneumonia. Interviewees would often preface their answer with statements similar to '*I'm not really sure, but I think it is caused by…*' or would phrase their response in the form of a question. Reindeer and herder women (familiar with tourists coming to Taiga, where they spend part of the year) commonly stated that diarrhoea was caused by improper hand hygiene and contagion.

I think it [diarrhoea] *spreads with hands. When we have visitors that come to our areas, we heard it was transmitted by various visitors. Foreigners and tourists, they seem to bring diseases. For example, this time we heard there is a virus around the Lake Khuvsgul area, people having flu and diarrhoea. And when the baby got sick there were foreigners who were coming to my area* [Taiga] *at that time.*

'*Improper hand hygiene'* was a common response from primary caregivers across all districts who also suggested that diarrhoea was caused by 'wrong food'. Wrong food included feeding contaminated (ie. not fresh) cow or reindeer milk to children, soup that was excessively fatty, store-purchased food that had expired, improper baby formula, or drinking unclean water without first boiling it. Caregivers in Nalaikh District only attributed the last three as causes of diarrhoea.

Health professionals perceived that it was not the availability of water and its quality that were problematic, rather the spread of disease was associated with mechanisms of water storage and transport, and lapsed hand-washing practices (among non-Kazakh people). Neither the use of latrines nor sanitation were raised as issues with regards to diarrhoea (discussed further below). In Nalaikh, health professionals discussed the frequency with which their diarrhoea patients were from poor families with unhygienic home practices. Here, incidences of childhood diarrhoea in particular were linked to poverty indicators, particularly the lower socio-economic status of people who worked in polluted environments (such as unsanctioned coal mines) and unemployment. Being unemployed as a causal factor of disease was a term used by health professionals in reference to multiple social factors including a community's lower educational status resulting in less knowledge about disease prevention.

Health professional 1: *Living standards make a lot of difference. If we go deeply into statistics we would see that mostly children and people from poor and vulnerable families are sick [with diarrhoea] more often. Those who are well off, then incidences of disease are relatively low.*

Health professional 2: *Hygiene also plays an important role. If you are unemployed and are poor then hygiene tends to be lower. In Nalaikh there is widespread unemployment. In the winter season, job opportunities are open in the coalmine. In other seasons, there are not as many job opportunities*.

Bagh feldshers working in Khuvsgul Province believed children's stomach problems were caused by improper feeding practices of caregivers and improper use of medicines. According to *feldshers*, bacterial disease, particularly associated with the stomach and gut (disbacteriosis), were more widespread today due to the use of antibiotics and subsequent drug resistance.

Women who had experienced high blood pressure during pregnancy or whose children were hospitalised for diarrhoea, also suggested that childhood diarrhoea was caused by hypoxia experienced during pregnancy or delivery.

Explanations of the symptoms and prevention methods of diarrhoea were more varied than those identified for pneumonia. In order of frequency reported, caregivers attributed the signs of diarrhoea to be: frequent stool that is either watery (most common) or green in colour; high temperature; weakened body; vomiting; loss of appetite; and thirst or dry mouth. Two mothers claimed not to know any signs of diarrhoea. Known methods of prevention, again in order of response frequency, were: proper nutrition for children; proper nutrition for breastfeeding mothers; clean hands/proper hygiene; protection of children from cold and flu and other common child diseases (in reference to strong immune systems); keeping children warm; and giving oral rehydration salts (a common practice for children experiencing diarrhoea). Two mothers stated they had '*no idea'* how to prevent children from getting diarrhoea. Mothers in Nalaikh who participated in focus group discussions added that childhood diarrhoea could be prevented by only feeding children home cooked foods and avoiding foreign-made, imported products. Among fathers, symptom recognition of diarrhoea was quite low. To prevent diarrhoea they suggested the need to pay better attention to what children were eating and to feed them more milk.

In discussing the severity of diarrhoea in relation to other child illnesses it was generally perceived that diarrhoea was a common or 'normal' problem. It would not warrant a trip to the clinic or hospital unless the condition persisted for several days and mothers feared their children were becoming dehydrated, or if the diarrhoea was paired with a second symptom such as vomiting.

Caregivers were also questioned about household water sources and storage, sanitation and hygiene practices. In Tsagaannuur and Renchinlkhümbe (Khuvsgul Province) the most common source of water was from a nearby lake or river. These waters were described as being very clean due to their proximity to the Taiga or 'cold jungle' (a wilderness area in far Northern Mongolia bordering Russia). Families in these areas discussed boiling ice in the winter to release frozen water, but not for hygienic purposes. Caregivers in Murun and Nalaikh were more likely to source their water from a well and to describe boiling water before drinking for purification. Most mothers in Nalaikh were unhappy with the quality of water used in the home due to pollution from the dirty trucks or large plastic containers that transported it from the well. Health workers at Suvarga Nalaikh Family Clinic provided additional context for this finding. They explained,

Water quality at source [in Nalaikh] is not a problem. Inspection agencies check the quality of water regularly with laboratory tests. For gher area people, it is the water containers that are the problem. It is the dirty containers that are the problem. In households, people tend to keep water in big containers that they cannot clean every week because it is too big. Swiss doctors came and did a survey and found that in Mongolia there is not much grey water [reused water]. Running water is ok to drink here. They found the problem is the dirty containers that people use.

In all of the study sites it was common for caregivers to have access to a pit latrine for the personal use of between one and three families (depending on how many family *ghers* shared the same yard). For Darkhad and Reindeer herder families who spent at least part of the year outside *soum* centres, the most common defecation system was to dig a hole in the ground and provide privacy by surrounding it with a short wall of rocks and stones or with wooden stakes covered with paper or cardboard. If the group was only to stay in an area for a few days then either these structures would not be built and defecation would occur in the open, or only one structure would be constructed for use by the entire group. For these groups, latrine use was not thought necessary for urination, and it was common practice to urinate in the open. A mother from the Reindeer people, whose child had pneumonia and diarrhoea at the time of interview explained,

The toilets are far from our tents and many families use the same toilet. Because we move all the time sometimes we only spend 10 days some places and other places we stay a little longer. So we don't have enough time to dig a toilet everywhere we go so many families often share one toilet.

Practices regarding the disposal of faeces from newborns, children not yet toilet trained or children experiencing frequent episodes of diarrhoea were different from adult practices for two main reasons: first, practical issues associated with children not being able to use the latrine, or use it in a timely fashion; and secondly because of the belief that a baby's stool was cleaner than that produced by adults and therefore warranted a different removal strategy, often away from more unsanitary adult waste collected in the latrine. A commonly observed practice for removing and discarding child faeces from cloth diapers would be for one carer to stretch the cloth diaper out and for a second carer to use a large knife (used exclusively for this purpose) to carefully scrape the surface of the cloth until most visible traces of the stool were removed. Faeces collected on the knife were then scraped into a plastic bag (again used exclusively for this purpose). The bag would be used repeatedly and would be stored under a bed or in an outer room of the home until it was full, when it would be discarded by burying it in the ground or under a rock. Mothers found it difficult to describe the length of time a bag would remain in the house until it was disposed. One mother, interviewed with her 20-day-old newborn, had yet to discard any of her child's bowel movements that she had scraped into a plastic bag kept under her bed. In Nalaikh, mothers used both 'Pampers' (disposable diapers) and cloth diapers. One mother in Nalaikh explained that Pampers would simply be thrown away once soiled. Other participants claimed, however, that disposable diapers were not discarded immediately after being removed. This finding suggests that regardless of using a cloth diaper or disposable

diaper, it is common practice to collect soiled diapers in one location for a period of time until they are discarded in bulk. (The practice was also discussed in a Ministry of Health and UNICEF report (2000) that documented the commonly held belief that discarding the stools was linked with reduced lactation and the child not receiving enough milk).

Hand-washing practices were generally of a high standard in both Khuvsgul and Nalaikh regardless of rural or urban location. Observational data from women's homes confirmed a washing stand with soap or a kitchen sink with soap in all homes/*ghers* visited. Women interviewed in province and district hospitals (originally from rural areas of Mongolia) frequently described simple, yet effective hand-washing areas in the absence of piped water or permanent washing stations. A Khalkh mother with a child hospitalised with diarrhoea confirmed,

In my area we wouldn't have a washing stand, but there is an area outside the gher that we have for washing. We cut away a bottom part of a Pepsi bottle and attach it to a wooden stick. We have a way of opening and closing the bottle for turning water on and off.

According to caregivers, the most common times for hand-washing with soap were in the morning after waking; in the afternoon after returning home from work activities; or when washing the hands and faces of their children. Other activities included washing clothes, cleaning the floor, tending the fire, after going to the toilet, before cooking, before eating, before touching babies and before feeding babies. If washing hands was deemed necessary during the day for a reason other than those stated, then a quick wash with water (no soap) was the most common method. One Kazakh mother discussed only using liquid Safeguard (an antibacterial soap) for her family, despite the additional cost. This detail was consistent with information provided during the focus group discussion with health workers at Suvarga Nalaikh Family Clinic who served a predominately Kazakh population. The health workers concluded,

There are quite significant differences between Kazakh and other populations. Kazakhs pay more attention to hygiene. They wash their hands more frequently after going to the toilet and before eating. Their houses are also cleaner.

A Kazakh imam further explained,

I visit with my Mongolian friends and see they keep used diapers in the house. I find this very strange because it would smell bad and was a dirty practice. For Kazakh people we are very good with hygiene. We bathe a lot and bathe our children a lot… In Islam, more than half of all teachings are about keeping good personal, household and environmental hygiene.

Pregnancy and birth complications

Upon first questioning, mothers in both districts expressed limited knowledge about common pregnancy or birth related complications. The initial response ('*I'm not sure*' or '*I have no idea*') was often phrased as a lack of knowledge because the mother herself had not experienced any complications during her own delivery/deliveries. When questioned further on specific experiences and the use of medications during pregnancy, women frequently mentioned swelling and high blood pressure as problems they had experienced. This had often led to their referral to the *aimag* hospital in Murun for delivery assistance, rather than delivering at their local *soum* clinic or hospital. Due to facility-based deliveries at these larger hospitals with better equipment and more qualified staff, women commonly stated that their deliveries (if not their pregnancies) were complication free.

On further probing women discussed symptoms of high blood pressure during pregnancy as pregnancy poisoning, pre-eclampsia, eclampsia and hypertension. This specialised vocabulary was used interchangeably. Other factors that were thought to potentially contribute to pregnancy and birth

Case study 1 – mother in Nalaikh with obstetric complications

In the final months of my fourth pregnancy, I began to experience increasingly high blood pressure and frequent vomiting. I was hospitalised twice for ten days each due to these complications. In the final month of pregnancy, my blood pressure was very high, over 150 [mmHG, systolic]. The doctors told me that the baby was at risk of hypoxia. A few days before I was due to give birth, my condition became worse. They told me that the umbilical cord was wrapped around the baby's neck and that I need to have a Caesarean section immediately. I stayed in the hospital for 5 days following surgery.

After the operation, it took a long time for my milk to come, much longer than for my previous three children. When it did finally come, there was not enough. I was worried that the baby was not getting enough to eat, so as soon as I got home from the hospital I started to use a foreign brand of formula. The baby's diarrhoea started the same evening that we came home from the hospital.

The diarrhoea got so bad that as soon as I would take off his diaper to change it, the baby would immediately soil the next one. I saw that his whole body was becoming weak, so I took the baby to the clinic and they prescribed Oralite [a type of ORS] to dissolve in water and give to my son in a bottle. He was having difficulty sucking my breast, but he seemed to take the bottle more easily.

We tried several different brands of formula to try and stop the diarrhoea. We found a local brand that we liked, but the stores in Nalaikh soon ran out of stock. So then we had to buy the most expensive formula that is always in stock [from Germany].

About 20 days after coming home from the hospital, I noticed that the baby had a fever and was sleeping with his mouth open. A doctor visited us at home and said that the baby's skin was slightly blue around his mouth and that meant he wasn't getting enough. She explained that it was because of the complications during my pregnancy, particularly my high blood pressure. They told me to take the baby out of doors often, so that he could have fresh air. If his nose is stuffy, the doctor told me, then he will not have enough oxygen and would not be able to suck the milk properly.

complications included kidney disease, difficulty in swallowing, respiratory distress, anaemia, the small size of mother (ie. small pelvis), a first delivery and the advanced age of the mother.

In Tsagaannuur, clinic staff reported high blood pressure, swelling and anaemia as common pregnancy complications. *Bagh feldshers* also discussed anaemia as a concern but most alarming from their perspective was premature birth and children born with hypoxia.

Feldsher 1: *Now it is very common that children have anaemia or some brain complications like hypoxia. In recent years, numbers of children with 'inborn' health complications are increasing.*

Feldsher 2: *Lately many pregnant women are having premature births. Not many women bear children full term – for ten months. The ultrasound will tell when the baby should be born but children are being born before their due date. Children are mostly born at eighth or ninth months of pregnancy. Many children are born with hypoxia in recent years.*

Approximately half of the fathers in the focus group discussion in Renchinlkhümbe listed high blood pressure, swelling and anaemia as common pregnancy compilations experienced by their wives. The other half of the group, however, reiterated the view, '*We don't know, we weren't in there. Women go in there* [to the delivery room] *and have babies and we are not present*'.

In Murun, midwives and maternity ward nurses discussed anaemia, big babies (too large for safe vaginal delivery), premature birth, preeclampsia, and severe maternal pneumonia as pregnancy complications that were of particular concern.

Maternity staff 1: During the last years, anaemia was very widespread among women of reproductive age. If women become anaemic during their first pregnancy and they don't take measures to restore their bodies to increase their haemoglobin, their anaemia worsens with subsequent births and all sort of problems occur like babies are born with hypoxia associated with the anaemic mother. Lately…children are born before term and mothers have many birth complications like preeclampsia. So in many cases in recent years, births have had to be induced.

Maternity staff 2: In recent years, more and more big babies are born as they are growing inside. Big babies cause lots of complications for birth.

Maternity staff 3: As of 2013 there has been one case of maternal death of a mother from Tsagaannuur. She had preeclampsia and also had very severe pneumonia. She had difficulty breathing and she died.

Maternity staff 4: She was a herdswoman living outside soum centre. She was in Tsagaannuur hospital for her pneumonia, but as her condition was getting worse, she was sent here [province hospital]*. She was in her seventh month of pregnancy, she was pre-term, the baby was only 1.4 kilos, a very small baby. She came two days before her delivery by C-section* [Caesarean section]*. It was a very urgent C-section to save the baby because the mother was in a very critical condition…she was in a hopeless situation.*

Maternity staff 5: During labour, some babies might have peri-natal hemorrhagic stroke related to a long and difficult labour because of weak contractions of the mother or with the wrong position of the baby in the uterus. If the baby's weight is too big, it causes problems during labour.

One mother in Nalaikh concluded that stillbirths, miscarriages, and congenital impairments were common in the district due to environmental pollution caused by the local metallurgy factory. She described the daily experience of waking up before dawn to a smell similar to that of a recently struck match. She explained, '*Pregnant mothers don't discuss it openly, but there are often stillbirths and miscarriages. My neighbour had two miscarriages. Lots of children born with heart defects. It is all because of the metal factory'*. Another mother whose child had pneumonia at the time of the interview confirmed,

We live nearby a metal factory and kids around this factory are very often sick with pneumonia and flu and there is a very bad strong smell in the area. We have complained to parliament members but no help has arrived. When we go to the countryside our kids are fine, but when they come back to Nalaikh they get sick…we can feel this very strong smell very early in the morning, like 4 am, because we live in a gher and don't have good protection.

Of the two pregnancy complications most frequently referred to by mothers – swelling and high blood pressure – cold weather was often the attributed cause for swelling, with reasons for high blood pressure during pregnancy unknown. *Bagh feldshers* also suggested that poor birth spacing was increasing women's work burden and causing later-in-life complications for their children.

Feldsher 1: *Birth spacing is so close in rural families. Within one year another baby comes. When the children are very close they tend to be not good quality babies since the children tend to have weaker health and immune systems.*

Feldsher 2: *Of course, when you have close babies you cannot take proper care of all children. You pay less attention and give less care to the second or third babies.*

Feldsher 3: *The work herder mothers do is quite labour intensive. Until giving birth they continue this hard work. This domestic work should be limited at late months of pregnancy."*

Health workers in both Khuvsgul and Nalaikh attributed pregnancy complications to missed or infrequent antenatal care visits. Maternity ward staff from Murun General Hospital specifically listed Darkhad women and those living in Jargal, Khankh, Tsagaannuur, and Renchinlkhümbe *soums* to be the majority of women who missed antenatal care visits. The reason for listing both the Darkhad ethnic group and these locations was the same: the distance from health centres. In Nalaikh, missed antenatal care visits were attributed

mainly to migrant mothers who came to the Ulaanbaatar area from other provinces in Mongolia. They were liable to receive health services from the provinces to which their citizenship was listed (rather than in Ulaanbaatar). This potentially caused delays in migrant women receiving antenatal care.

Kazakh family and doctor, Nalaikh (Nalaikh District).

Care-seeking behaviour and practices

Spiritual and traditional healers

Local healers were described as 'traditional' or 'spiritual' interchangeably. Local healing practices appeared particularly to be followed by two distinct ethnic groups, the Darkhad (Khuvsgul) and Kazakh (Nalaikh). Shamanism in Khuvsgul was generally accepted to be Darkhad in origin, and non-Darkhad peoples (eg. Reindeer women) would visit Darkhad shamans. In Nalaikh, this was not the case. Although Kazakh caregivers could seek spiritual healing beyond their immediate ethnic group, Kazakh healers were only frequented by other Kazakhs in Nalaikh.

It was accepted practice that local healers did not dispense medication, but performed traditional treatments deemed to be spiritual in origin and prior to caregivers seeking biomedical assistance. Their treatment skills were attributed to years of experience, their ability to communicate with spirits, an inherent talent for assessing illnesses, and their potential to effect a cure. Neither Darkhad shamans nor Kazakh healers had a set price for their services. Families would pay them whatever amount they could afford, usually between 1,000 and 2,000 Tugrik (0.58 – 1.17 USD) as a sign of their respect and gratitude for treatment. It was also known that Darkhad shamans and Kazakh healers would not treat pregnant women or those experiencing any birth related complications. When asked if pregnant women ever came to her for assistance, one elderly female Darkhad shaman explained,

Yes, but I advise them to go to Murun for check-up and delivery. I usually advise people to go to hospital for treatment… One lady came to me, an older woman and I advised that due to her age she needed to go to Murun to give birth. She did follow my advice and both the baby and the mother are fine now. Many people lately go to Murun for delivering their babies.

When asked the same question, a Kazakh healer concluded,

Yes, pregnant mothers come but I never treat them. I tell them about complications and if there is some case of haemorrhage or something happens I cannot really help them. I advise them to go to the doctor. If the lady is not pregnant then I can help her. I advise pregnant mothers that their condition is out of my hands and better they go to the doctor and see the doctor and be under the doctor's control.

Caregivers also mentioned Buddhist monks as a source of spiritual healing, although not direct treatment. Through prayers and incense burning, families would appeal for help when illness conditions were severe enough to cause anxiety. Kazakh mothers and the Kazakh imam interviewed described similar care-seeking behaviour. Caregivers also visited religious leaders for the purposes of prevention (for example, to pray for their daughters to have a safe delivery) or when all sources of biomedical treatment had been exhausted.

Darkhad shamans

In Khuvsgul, caregivers visited shamans for illnesses attributed to spiritual causes, not for pneumonia or diarrhoea as these were perceived to be medical conditions and their treatment fell, in general, under the auspices of health workers. For example, when a child was fearful after encountering a stranger, they may experience uncontrollable crying, a condition perceived to be outside the realm of a doctor. A shaman would perform rituals with incense, and cure children of their fear so that they would stop crying and sleep peacefully at night. *Bagh feldshers*, clinic and hospital staff were aware of this practice and considered it either harmless or psychologically beneficial to parents and their children. At times, however, underlying medical conditions may have contributed to the presentation of symptoms. As one shaman explained,

When children have this situation of being afraid of something or somebody they come to me a lot. Last night I went to a family for this purpose and the parents said the child is sleeping well now… The baby had temperature and a stomach filled with gas and was crying a lot so maybe the baby was scared of something. I usually touch the foreheads of babies three times and then hit the ground to take away the pain. I felt that baby had a high temperature and parents confirmed that the baby was having temperature. Baby is now feeling better. This 'being afraid thing' is something that happens to both children and adults.

Kazakh healers

Whilst Kazakh healers did not treat pregnant women, they did have very specific guidelines for mothers to follow when caring for newborns. These were noted by all Kazakh interlocutors including the Kazakh imam, Kazakh caregivers and Suvarga Nalaikh Family Clinic staff. According to Kazakh tradition, in the first ten days of a newborn's life they should be bathed in warm black tea water or water with salt. The water should first be 'cleaned' by placing a piece of silver (such as a silver necklace or bracelet) into the bath water. Sheep tail oil should then to be applied to the newborn's skin to keep it hydrated. In keeping with the routine hygienic practices of Kazakh families (discussed above), the healer advised women that any towels, soaps, oils and bathing equipment used for newborns should not be used by adults. Their items were to be kept separate. A Kazakh imam suggested that this was different to the practices of most Mongolians who were too '*afraid of wind or that children will get sick*' to bath their newborn children.

According to one Kazakh healer, the purposes of these daily baths were to,

Help the baby to become more mature. Because baby skin is so sensitive, these things are helping them with adaptation. After 40 days the skin of the baby has one layer that has been taken off, so the babies' new skin can come. It is more mature skin.

In discussing common Kazakh practices for newborn children, clinic staff from Suvarga Nalaikh Family Clinic described the Kazakh habit of sequestering children indoors for the first forty days as a potentially harmful practice that prevented children from breathing fresh air. However, Kazakh interviewees confirmed that whilst it was common for family members and even close relatives to wait until a child was 40 days old before visiting the mother's home, this did not necessarily mean that the child would be kept exclusively indoors during that period.

For the treatment of childhood pneumonia, traditional practices involved applying horsemeat oil to the child's skin and then placing two slices of thinly cut horsemeat on their back over the position of the lungs. A binding would be wrapped around the child's chest to tightly seal the meat onto the back '*so it is like a vacuum, no wind is to get inside'*. The binding would be left overnight and, when removed the next morning, if the meat was white and dry then it was thought to have 'sucked up' the infection from the lungs. This practice would be repeated for three to four nights in order to cure pneumonia. In narrating these practices, the Kazakh healer reiterated that she did not produce or provide medicines. If medicines were required, her advice to parents was to take their children to the doctor. Local clinic staff were aware of this form of treating pneumonia and appeared ambivalent to its practice.

Children with diarrhoea received massage, although only if the diarrhoea symptoms were accompanied by a headache. Veins in the child's head or wrists were examined to predict whether or not the healer's treatment would work and then, if the treatment was deemed to be helpful, would be massaged to improve the circulation of their blood. Massages would continue for two to three days until symptoms improved. If no improvement was seen after this time, the healer would advise parents to take their child to the doctor. Determining whether or not the massage would help a child in this condition was perceived to be a spiritual sign and was an inherent ability of a talented healer.

Traditional medicines

The use of traditional medicines was only described by one Reindeer mother who explained that Reindeer people living in Taiga used herbs for treating disease and illness, '*We just know what herbs are good for what diseases*'. She confirmed that when her son had diarrhoea during the night when the clinic and pharmacist were both closed, she collected burnet herbs from near the river, boiled them with sugar and gave the water to her son in a bottle, but she took her son to the clinic the following morning. Now a permanent resident of Tsagaannuur, this mother lived in closer proximity to the hospital and explained that she was able to seek medical attention more easily.

A *bagh feldsher* participating in a focus group discussion suggested that more women and children should be treated with *vansemberuu*, a very rare Mongolian flower, used to treat respiratory infections. However, other *feldshers* in the group immediately countered his statements, saying that this flower was too rare to be useful.

In Nalaikh, the use of traditional medicines was not discussed by any participant and it was made clear in both Nalikh and Khuvsgul that local healers did not use or prescribe medicines as part of their treatment practices.

Pharmacies, self-medication and prescription drugs

For the majority of respondents, common symptoms including fever, coughing and a runny nose, were first treated with medicine bought at a pharmacy. Upon recognition that a child had an elevated temperature, mothers would frequently purchase paracetamol. Septrin and antiflu were used for treating cold and flu symptoms including coughing. Chitamon was also used for coughing and other flu-like symptoms particularly associated with very young children. Oral rehydration salts (ORS) were commonly used to treat diarrhoea.

These commonly purchased medicines, although not described as inexpensive (typically costing between 1,000-1,300 Tugrik or 0.60 – 0.75 USD), were usually affordable. In contrast, prescribed antibiotics such as amoxicillin (costing approximately 7,000 Tugrik or 4 USD) were often prohibitively expensive. One mother reported that after her 15 month old daughter was diagnosed with pneumonia and diarrhoea, she received a list of medicines from the health centre to purchase at the pharmacy: paracetamol, ORS, vitamin-C and amoxicillin. Upon learning the price of each medicine, the mother selected to buy the least expensive (paracetamol, ORS and vitamin-C). She was unable to purchase the antibiotic and could only afford part of the package of vitamin-C supplements. A migrant mother in Nalaikh described similarly practices, concluding, '*I try to choose the most important prescription and try to get the correct dose for intake, but I cannot know which ones are most important? I can't follow the doctor's instructions as I want to*'.

The choice of which pharmacy to visit depended primarily on its availability and location. In Khuvsgul there were usually one or two pharmacies per *soum*. In Nalaikh, the number of pharmacies increased with the population size, however proximity to the family home was still a primary consideration. One pharmacist interviewed stated that there were four pharmacies in Nalaikh that provided prescribed medicines to the poor at reduced prices (her pharmacy was not one of the four), but caregivers in the locale did not mention this as a factor determining where medicines were purchased.

If mothers were unable to attend a health clinic (due to distance, road conditions, lack of transportation or if the children's symptoms were first recognised at a time when the clinic was closed, such as at night or during weekends) then pharmaceutical treatment began at home and was continued until the symptoms resolved or the child was able to be taken to a clinic. In Tsagaannuur, Renchinlkhümbe, and Murun city, caregivers would typically wait for a period of one to three days before attending a health clinic. For herder families living outside *soum* centres it could be weeks or months before a child was taken to a clinic or hospital, with longer waiting periods associated with winter months and their corresponding travel

burdens. In preparation for this, herder women would frequently stock up on common medicines before leaving *soum* centres for Taiga.

In Nalaikh, as in Khuvsgul, self-medication through independent purchasing of pharmaceuticals was common prior to seeking medical attention. Caregivers were familiar with the specific medicines they wanted to purchase and would request them by name at the pharmacy. Pharmacists confirmed that most caregivers knew what medicine they wanted before entering the store, and added that '*most common drugs now have instructions in Mongolian not in Russian like in years past so people can read and take correctly*'. One pharmacist described a home remedy she gave parents requesting ORS if she had none in stock, '*One litre of clean and boiled water, five sugar cubes and some salt, just enough salt to make it taste a little salty but not very salty*'.

Health workers at Suvarga Nalaikh Family Clinic also discussed the common practice of caregivers purchasing specific drugs from pharmacies prior to medical consultation. They attributed the ready availability of medicines to greedy pharmacists and an increase in television advertisements marketing drugs.

Health worker 1: *One worrying thing among our people is the uncontrolled consumption of medicines. Before coming to doctors, they go to pharmacies asking for medicine. Pharmacies want to make money so they sell expensive medicine without instructing parents on how to use properly.*

Health worker 2: *Also, there are strong commercial advertisements pushing products on television. So parents will see an advertisement and go to the pharmacy and ask for that medicine without consulting the doctor. We cannot treat patients according to the standard guidelines because they are taking medicines other than those we have prescribed to them. We cannot know everything that they are taking.*

Health worker 3: *Today the common antibiotics, like amoxicillin, can't treat illness anymore because people use them so often and viruses become resistant. They don't take the medicines as they are supposed to be taken and it no longer works for them. Parents will give all sorts of medicines to children without consultation with a doctor. At least for children under five, the use of drugs should be very strict. Not like today and the kind of uncontrolled use of drugs we have here.*

Affording medicines was challenging and caregivers described their practice of purchasing small quantities of drugs, rather than the full pack or dosage, due to lack of funds. This was true for both over-the-counter and prescription medicine. One pharmacist concluded, '*they* [parents] *say they will come back for the rest when they have more money, but they never come back*'. Caregivers commonly described giving their children medicine according to the timetable prescribed by the doctor or until the medicine was 'finished' (also as directed), but clinic staff disputed this claim and suggested that women rarely gave medicine to their children as directed.

Amoxicillin was the antibiotic most commonly prescribed for children. Pharmacists claimed that they would not sell amoxicillin without a prescription, but observational data suggested otherwise. During an interview with a pharmacist in central Nalaikh, a caregiver entered the pharmacy and confidently requested one dose of amoxicillin. Glancing frequently at the research team, the pharmacist declined saying, '*Don't you see people are here monitoring me?*' Visibly confused, the customer left.

Health facilities

All participants had visited a health centre in the recent past. Although this was partly due to the purposive sampling methods used in the research, interlocutors confirmed that when available and accessible, health facilities were routinely utilised for child illness in Mongolia. Overall, respondents demonstrated a positive attitude towards biomedicine but had a negative impression of the delivery of health services at public facilities (discussed further below).

Purchasing medicines from a local pharmacy was often the first phase of care-seeking behaviour (due to issues of access and the perception that the child's illness would resolve quickly with over-the-counter drugs), but if the severity of the illness progressed, or more than one symptom presented at a time (such as vomiting and difficulty in breathing), then caregivers would routinely attend a health facility. This was true in both Khuvsgul and Nalaikh, even where mistrust of health facility diagnosis and prescriptions was widespread. Caregivers would attend their local family clinic, and then, if a second opinion was required, the district hospital.

All participants confirmed that their children had received vaccinations at health facilities, with the completion of recommended immunisation schedules dependent upon the current age of the child. Caregivers perceived childhood vaccinations were useful '*to make children healthier*'. At the health clinics in Tsagaannuur and Renchinlkhümbe (Khuvsgul) a staff member was designated the 'vaccinator' with responsibility for providing the vaccination service. In Nalaikh, all clinic staff were able to perform vaccinations. Health personnel in both Khuvsgul and Nalaikh described the practice of dividing the families in their district and allocating a member of staff to be responsible for reminding them of their children's next immunisation date.

The only occasion on which immunisation schedules were interrupted was due to the remoteness of herder families living far from the *soum* clinic when the next vaccine was due. A mother from the Reindeer people stated that her 7-month-old son, '*was receiving the timely vaccines for first few months, but for his fourth month vaccine he only had it recently in the soum because we were living in Taiga at the time it was due'*. Hospital staff in Tsagaannuur discussed their frustration with herder families who did not bring their children to the clinic to receive routine vaccinations on time. One health professional concluded, '*People from soum centre are fine but rural people, when we call and remind them about vaccines and ask them to come for their child's vaccine, the family will say come to us*'.

All participants concluded that delivery at a healthcare facility with skilled staff in attendance was the preferred method of childbirth. No interviewee had delivered at home, although several discussed women who had given birth in the ambulance on their way to the hospital. Such occurrences were also detailed by health staff in Khuvsgul, who attributed two main reasons: either women did not leave their rural homes early enough to be admitted to the maternity waiting homes in Murun, or they had experienced a difficult labour and had been referred from the *soum* clinic to the provincial hospital due to complications. Policy recommended that expectant mothers attend the waiting homes ten to 14 days before their due date, however clinic staff confirmed it was common practice for women with no family or only distant relatives in Murun to delay entering maternity waiting homes until a few days before their expected due date. As one health worker concluded,

Sometimes when we want to send some mothers to the province early they say it is very uncomfortable for them to be there that long, to be a burden to other families, so that is why they don't want to go there early and they stay here in the soum too long.

Regular antenatal care (ANC) visits, again with the exception of herder women, were common in both regions. Respondents confirmed that women sought ANC to confirm a pregnancy or when they suspected they may be pregnant due to a 'growing stomach' or early indicators such as vomiting. Recognition of pregnancy was the most commonly cited reason for seeking ANC, but there were great variations in the time it took women to discover their pregnancy, and ANC could start at any time between the first and fifth month. Once started, however, monthly ANC visits appeared to be regularly followed and older mothers were likely to attend more frequently (every two weeks).

Herder women and those living in rural areas far from health centres were the exception. Regardless of the month in which pregnancy was first noticed, ANC was generally delayed until the families moved closer to *soum* centres. These moves were most often precipitated by families wanting to be closer to *soum* centres not for healthcare, but to visit children staying in school dormitories. Reindeer mothers confirmed that pregnancy complications resulted from of lack of antenatal care.

According to maternity ward staff at Murun General Hospital,

> *Most of the women who have complications are those who fail to have regular antenatal care. They are mostly rural herdswomen who because of their life, because of their difficult work conditions and long travel, for example, are not able to visit the clinic often. We conduct many trainings and give lots of advice, but these rural people are the ones who tend to have these complications.*

Health workers at Suvarga Nalaikh Family Clinic also discussed difficulties accessing antenatal care among herder women. They explained,

> *There are some herder people, who are Nalaikh residents by registration, but live in Tuv aimag, Erdene soum, which is a nearby soum. For some herder families living in this soum it takes some time to come to the family clinic in Nalaikh.*

Bagh feldshers

Bagh feldshers, rural health workers, were a crucial source of healthcare provision and knowledge for the rural population living outside *soum* centres. *Feldshers* performed household visits to the rural communities they served, but the services they provided to each area (or *bagh*) were highly variable.

Fathers in Renchinlkhümbe suggested that the *feldshers* were more likely to visit them during the summer, when herder families lived further away from the *soum* centres and therefore needed increased healthcare services. One Reindeer mother claimed that *feldshers* would only visit families in Taiga when they were called because of an emergency. Preventative care visits and follow-up were not common. In contrast, a Khotgoid mother from Tumurbulag explained the *feldsher* in her area provided regular visits to mothers during pregnancy and after delivery. She confirmed, '*When I was pregnant the feldsher came quite frequently because everybody knows that I have high blood pressure. It reached 160-170 or above… the feldsher now comes twice a month since I delivered*'. Similarly, a Khalkh mother from Tsagaan Uul also stated that her *bagh feldsher* visited every month during her latest pregnancy to provide antenatal care. In the four months since her baby had been born, the *feldsher* had visited twice for postnatal check-ups.

When questioned about their responsibilities for following-up newborn children of rural families under their care, *bagh feldshers* could easily recite IMCI protocols. They stated that, according to IMCI guidelines, child assessments should be made during the first week of a newborn's life and should continue at regular intervals according to the child's condition and age, once a week for the first month and subsequently once a month.

Private clinics

Only a few caregivers had attended a private clinic. For many, it was a desirable although unattainable option due to costs and location, as private clinics only existed in central urban areas. Interviewees estimated that the average cost of visiting a private clinic was at least 20,000 Tugrik (11.67 USD), whereas attending a public clinic or hospital was, at least in theory, free at the point of service delivery. The small number of respondents who had attended a private clinic offered two primary reasons for doing so: first, to receive better services from doctors with more time and who were able to provide health counselling and advice (which public clinics and hospitals had failed to do in past); and secondly, due to their severe mistrust of public clinics arising from earlier misdiagnoses of their child's illnesses. In addition, one mother had attended a private clinic for ANC, not of her own volition, but at the insistence of a doctor from a public clinic in Ulaanbaatar. The ultrasound machine at the public clinic was broken, and she was required to pay for an expensive 3D ultrasound at the private clinic.

The doctors at the family clinic in UB required me to have this 3D test to identify birth defects in the foetus. Doctors advised that if I did not get this test done then the child-care allowances by the government would not be given. So I would have spent the money required for this test on injections for swelling. But I had to spend this money on the 3D test to get the government allowance when the babies were old enough, so I could not get the medicine for swelling.

The doctor's instructions to this mother were likely related to a practice, confirmed by health workers in Nalaikh, whereby government allowances given to families per child (from the age of five months) were not allocated until proof of antenatal care was provided.

Facility births and immediate post-partum care

The following section discusses facility births and immediate post-partum care, including cutting the umbilical cord, skin-to-skin contact and cleaning and drying of the neonate. The details are presented in line with mothers' recollections and the practices described by health professionals.

Mothers with newborn children confirmed during interview that all had delivered at hospital facilities. Women's descriptions of labour suggested that typically there would be four to six people in the delivery room including a doctor, nurse, midwife and a midwifery assistant. No mother described their husbands being in the delivery room, a fact reiterated by fathers in the focus group who suggested they were not present during delivery (see above). Maternity staff at Murun General Hospital confirmed that if the progression of birth was 'normal', the midwife would lead the delivery. Doctors only became involved during complicated or obstructed labours. The hospital had one neonatologist who was responsible for emergency assistance andresuscitation if needed. They only worked during the daytime, however, and as a member of staff concluded, '*We have only one neonatologist for the whole hospital so that is why she cannot be here at night*'.

The women who had normal deliveries recalled that the baby was placed on their chest soon after birth to provide warmth, typically until the placenta was delivered. Then the child was washed, dried and wrapped, and health staff rapidly initiated breastfeeding, usually 30 minutes to two hours after the birth.

In Tsagaannuur, health staff confirmed that all doctors and nurses could manage deliveries stating '*it just depends on who is working at that time*'. When questioned about immediate post-partum practices, they articulated the following key steps,

Health staff 1: *Keep the baby warm by putting it on mother's chest…*

Health staff 2: *Initiating breast-feeding after 30 minutes…*

Health staff 3: *Do suction of the respiratory system, if the baby needs it…*

Health staff 4: *Then when pulse of the baby and breath of the baby becomes stable, we cut the cord.*

Midwives and maternity ward nurses at Murun General Hospital confirmed the steps they took immediately after birth,

Maternity staff 1*: We dry the baby and put the baby on the chest of the mother. For two hours we keep checking on the mother. The very important thing is to prevent loss of heat so that the baby doesn't get cold. For two hours we monitor the mother like this in the delivery room after birth. Within 30 minutes after birth we start breastfeeding.*

Maternity staff 2: *So if everything is fine we take and wrap the baby and take the mother on the trolley to the after delivery room and then we transfer the mother into the care of the afterbirth midwife.*

Similarly, maternity ward nurses and midwives at Nalaikh General Hospital explained,

Maternity staff 1: *At the delivery room, according to the obstetric guidance, the midwives manage the third stage of delivery. When the babies are delivered they are placed on the chest of the mother, we put them on the naked chest of the mother to keep warm. The first feeding goes on at this stage. If we need to, we clean the respiratory system. Then we would cut the cord and put a hat on the child. We would take the child from the mother to the warm table and wrap the child in warm clothes. After two hours, the mother will breastfeed the baby.*

Maternity staff 2: *We usually promote hand-washing before touching the baby. And also we teach the mothers how to sit properly when feeding, how the baby should be held and how the nipple should go into the mouth of the baby, how to make it free to breathe while eating so that the mothers, the first-time mothers, can use these practices."*

Although managing deliveries was not part of their routine care, *bagh feldshers* in Khuvsgul were also able to recount specific steps to be taken immediately after birth.

The baby should be dried and then put on the mother's body for skin-to-skin contact. The baby's mouth and nose should be suctioned. The baby should be weighed. In accordance with the baby's weight, vitamin-K injection is made to the newborn.

The frequency with which mothers described Caesarean section was significant, particularly given the small sample size of the study. Of the 16 mothers who participated in in-depth interviews, six had required surgical intervention due to complications or as a result of a previous Caesarean section (see Table 3).

Table 3 – C-sections reported by primary caregivers interviewed

Mother's residence	Mother's age	Reason for C-section	Delivering hospital
Tsagaannuur	29	1st child delivered C-section	Murun
Murun	23	Pelvis too small / big baby	Murun
Murun	27	Overdue/high blood pressure	Murun
Nalaikh	35	High blood pressure	Nalaikh
Nalaikh	20	Overdue	Nalaikh
Nalaikh	28	1st child delivered C-section	Nalaikh

One additional mother described feeling pressure to deliver via Caesarean section at Murun General Hospital due to her high body weight, however, she resisted and delivered naturally (see Case Study 2).

When asked if there was an elevated number of Caesarean sections performed at Nalaikh General Hospital, maternity nurses suggested that any more than 14% of total births would be regarded as a high rate. All nurses felt that the current number of C-sections performed at Nalaikh General Hospital was significantly higher than 14%, although 2013 statistical evidence was not yet available to support this assumption. According to the study's small sample, 30% of the mothers interviewed in Khuvsgul Province (3/10) had undergone Caesarean section, and 50% of mothers interviewed in Nalaikh District (3/6). Although beyond the remit of this study, this seemingly elevated rate may warrant further investigation.

Post-Caesarean post-partum care procedures varied. Mothers described the child being taken out of the delivery room directly after birth and returned to them, dried and warpped, when the mother's epidural had worn off. A Khalkh mother of twins born by Caesarean section in Murun General Hospital explained, '*They did not give me baby to hold after delivery. They should do that but I wasn't feeling very well after the surgery. I was close to vomiting. They gave me an injection to relax me and then I fell asleep*'. For mothers who had undergone Caesarean section, breastfeeding was not initiated until several hours after the birth, or even the following day.

Case study 2 – Mother who almost underwent a Caesarean section

I had a very unpleasant experience with one midwife in the delivery room. During delivery the midwife said aloud, '*She's so fat, why didn't we just do a Caesarean section*?' I gained 40 kilos during my pregnancy, so this is why I am bigger than normal. To hear the midwife say that was very uncomfortable. Because of this, maybe I tried too hard during the delivery to prove to the rude midwife that I was OK. Maybe I didn't follow the instructions properly because I did not want a Caesarean section. I was trying very hard during my contractions, with too much force to prove that I was alright and could give birth quickly and in a good way. I felt very insulted when the midwife called me fat. In the end I had a tear that needed stitches. The tear is very close to the anus. Because of the lack of available beds, I had to leave the hospital after only one day despite the stitches.

Low milk production and supplementary infant feeding practices

Mothers were advised by maternity staff to exclusively breastfeed for between six months and two years and they suggested that, in general, mothers should '*continue to breastfeeding for as long as possible*'. Mothers interviewed demonstrated a low level of knowledge about colostrum, and only one reported that '*the first milk is very good for children, very good for immunisation against certain diseases*'. For many women, particularly first time mothers, delay in milk production and difficulties with breastfeeding caused high levels of anxiety. Commonly described problems included the perception that the quality of milk produced after a Caesarean section was poor; the baby's inability to suckle properly due to hypoxia or respiratory distress; and inadequate or insufficient maternal nutrition. One Khotgoid mother who had delivered a stillborn child from her penultimate pregnancy reported applying a green tea poultice to her nipples to stop milk production after the birth. She attributed her low milk production after her subsequent (and most recent) delivery to be a direct result of this practice.

Mothers who reported to stop breastfeeding prematurely or started supplementary feeding earlier than advised, forwarded several reasons, the most common being that low milk production led them to use cow or reindeer milk, or infant formula. Other reasons were that the child rejected the breast and would not suckle, or to wean one child so that another could begin breastfeeding. Supplementary feeding with cow or reindeer milk usually started during the second or third month after birth, whilst store-bought formula (more common in Nalaikh) tended to be introduced during the first month.

Mothers who practiced supplementary feeding often regarded it as the cause of their child's diarrhoea. One Khotgoid mother explained, 'I *think the diarrhoea might be related to giving the baby cow milk. Since the birth of the baby I did not have enough milk so started giving cow milk right away*', whilst another Kazakh mother reported, '*As soon as the baby came home, we started to give the baby formula. Maybe this formula wasn't very good and that is why the diarrhoea started*' (see Case Study 1 above).

A health worker in Tsagaannuur suggested that Reindeer women gave reindeer milk to their children in the belief that it was a cure for diarrhoea. Data from the study does not support this interpretation as women reported that reindeer milk actually caused their child's diarrhoea. The alternative scenario, that a child did not receive nutrition due to low milk production or problems with breastfeeding, did not seem a viable option to them, even if it did result in the child having diarrhoea.

In relation to their work with herder families living remotely from *soum* centres, *felshers* explained,

Feldsher 1: *Children of rural herder families are not exclusively breastfed. Because herders are busy with lots of work they cannot breastfeed children being so busy. Also they don't take proper care of their children with feeding so this is why the children get a stomach upset.*

Feldsher 2: *In soums or central and settled areas, women have more time for breastfeeding and childcare. But busy herders cannot have the time to breastfeed properly due to their difficult lives. Just two weeks*

after child is born the mothers again start herding animals and domestic work and so do not feed as often as they should. Some mothers might go herding sheep for several hours, for example.

Feldsher 3: *We instruct people to exclusively breastfeed for six months.*

Feldsher 4: *Although some people introduce* [supplementary feeding] *earlier when children are four months for example. Some mothers do not have enough milk to feed their children.*

Maternity staff at Murun General Hospital reiterated that both breastfeeding and the early use of milk substitutes due to fears about low-milk production were common practices.

Maternity staff 1: Among Mongolians nobody would resist breastfeeding, but sometimes just the nipple can be too small or some other such problems.

Maternity staff 2: Six months exclusive breastfeeding is recommended, but if mothers have enough milk they should continue to breastfeed until the baby is maybe two or three years old. In some cases, if mothers don't have enough milk, they usually start adding other milk or substitutes.

Maternity staff 3: Actually good amounts of milk comes some three days after birth, but some mothers don't know about it or they cannot wait keeping their babies crying. They think the baby is not getting enough to eat so they get worried and start feeding something else.

In relation to the comment that the '*nipple can be too small*', a Kazakh healer interviewed in Nalaikh offered specific instructions to breastfeeding mothers and their families. She suggested that the main challenge mothers faced was their lack of skill to breastfeed properly. When women visited her to ask for breastfeeding assistance or advice, she explained how she would first examine their nipples to see if they turned inwards or were erect to enable suckling. She advised husbands to suck the nipple to draw it out and make it easier for infants to breastfeed. The healer concluded,

I ask the husband to do this in front of me to make sure it happens in case he is shy and won't do this after returning home. In this way the fathers can support the mothers. I tell fathers that it is not bad to suck the milk, to drink the milk. This milk is good and it is good for the lungs. I tell them this to encourage them to suck. Fathers are really shy at first, but because the newborn babies can't really suck well, and the fathers are better, they can do this for the mother and help her to have no pain in her breasts.

The health workers at Suvarga Nalaikh Family Clinic who participated in the focus group discussion in Nalaikh had an average of 25 years experience and speculated why contemporary women appeared to produce less milk than in previous years.

HCW 1: Compared to Europe, breastfeeding rates are high here, but still the rates of women having not enough milk are higher than in previous years.

HCW 2: It's hard to say exactly why this is. It's not clear. More and more mothers say they do not have enough milk in recent years. Maybe poorer mothers don't have enough nutrition to feed babies properly.

HCW 3: No, even in more well off families women are not producing enough milk these days.

HCW 4: Maybe today's mothers are a little impatient. They don't want to wait 2-3 days for milk to come so they supplement with formula and then when babies start drinking from bottles, which is more convenient and easy, they prefer bottles rather than mother's milk.

Case study 3 – Mother of four-month old baby with pneumonia

I worried about my health when I was pregnant so I used to go to the hospital frequently if something seemed to be wrong. On 1 May [2013], I went to the hospital for an ultrasound. Originally, I was told that my due date would be 17 May. The ultrasound examination gave a revised due date of 31 May and also it found that the cord was in the wrong location. Doctors said to come later and if the situation was still wrong I should have a Caesarean section.

I again visited the clinic on 3 June as this was beyond the 31 May date set by doctors. When I came to the clinic my blood pressure was high and the due date was past. Clinic doctors said go to *aimag* hospital. I had to go early to get an appointment at the hospital and it took a long time. After my appointment, the hospital said that I should have an ultrasound examination on 6 June. Again, I had to get an appointment for another ultrasound. After that ultrasound, I was told that my case would be discussed during the doctors' board meeting the next Friday. After the board meeting, I was told to come to the hospital on 10 June, which was the next Monday. So, I went back to the hospital then. My blood pressure was becoming very high. The hospital decided to induce the birth as my blood pressure continued to increase. It even went up to around 200. So the doctors performed an urgent Caesarean section even though I wanted to deliver on my own. I didn't want to have a Caesarean section.

If I had known that when babies are inside after the due date it is bad, I would have come to the clinic earlier. I lost one week. If I knew it was dangerous for me or my baby I would have come sooner. If the hospital doctors had accepted me on 3 June when I came, some five days would not have been lost and maybe the Caesarean section wouldn't have had to be performed. When the baby was born it had hypoxia because of my complications. I really regret I had the Caesarean section. I never wanted that.

I had surgery around 3pm on 10 June. During this time, because the baby had hypoxia, I was being treated in intensive care. When I was able to get up around 9pm after the surgery, I went to the baby and tried to breastfeed but it was very difficult for me to sit right after the surgery. Because the baby had hypoxia she could not suck the breast properly. My nipples were small as well. The nurses finally brought the baby back to me at 11pm with instructions to return her if she turned blue.

We came home after three days in the hospital. I was trying to feed the baby, but it was very hard. The stitches from the surgery hurt a lot. I was pumping my breast into the baby's mouth to get her milk, but she still couldn't suck well. I would pump out my milk by hand and put it in a bottle warmed in water. But then the doctors advised me not to use the bottle, but to try to use the breast.

When my baby did finally learn to suck, my milk had reduced in amount. I had no milk when she was around ten days old. Because the baby couldn't suck properly, my milk reduced. My grandfather advised me to feed her with cow milk. So I decided to give cow milk in addition to my breast milk. But the smell of baby faeces seemed to be not good, so I immediately stopped the cow milk. My uncle advised me to give formula, but I read the explanation on the container that said it should only be given with doctor's advice. So, I first went to the doctor to ask advice. They advised exclusive breastfeeding. Following that I was feeding her only with breast milk for the first month. When we had a one-month check-up the weight of baby had increased only 100 grams from birth [3,300 grams at birth]. The doctors suspected something was wrong because my baby was not gaining weight and because she was inside me too long and had hypoxia. So I started to give breast milk substitutes.

At around one month old she started coughing from time to time, very infrequently. This started when milk substitutes were added. The doctors said it wasn't very serious but still it seemed to be the early signs of pneumonia. They prescribed some medicines. I gave her all medicines. But then last Monday when her coughing increased, I went back to the doctor. Since then I have been back to the doctor three times because I have been so worried about her. Last week the doctor diagnosed her with pneumonia and prescribed an antibiotic syrup.

Child deaths from household accidents

Although it was not part of the research protocol for this project, the frequency with which both caregivers and health professionals mentioned child deaths and disfigurement from accidents should be highlighted. According to the Head of the Public Health Division in Khuvsgul Province, at least 12 children died because of accidents (traffic, drowning or suffocation) between January and September 2013. Doctors at Nalaikh Health Department speculated that approximately one-third of childhood deaths in their district were the result of drowning, household fires and other accidents.

According to health professionals in Khuvsgul Province, the area has an elevated rate of accidental child suffocation as a result of the household fires that are required to combat the harsh winter temperatures which can reach minus 25 Celsius. A public health worker in Murun, however, attributed the increased rate to the fact that during winter nomadic travel, Darkhad mothers carry their children in wooden baskets loaded with blankets, and the children suffocate under the weight of the blankets during extended periods of travel. A doctor at Renchinlkhümbe Health Centre provided more details,

> *Families have to make very long moves, 140 kilometres for example, and have to pass over the mountain. When they move, children are put in baskets. In the past, herder families used to have safer ways to transport children in cold conditions. Modern people don't know how to do this, don't know the old ways and children may suffocate in their baskets from the blankets… People from this soum move in very cold seasons, over the mountains in search of winter places. Here, we try to persuade them not to move in the cold seasons and not to move so far away. Currently we keep a list of children who are supposed to move soon and we are trying to convince families to wait until it is warmer.*

In Nalaikh, a paternal grandmother caring for her two year old grandson with diarrhoea attributed his weak immune system to a household accident that severely burnt his arm and necessitated a skin graft from his leg. She described how, since the accident, the boy was very weak, became sick easily and had trouble walking. The accident occurred when the boy's parents had left the house to tend their livestock. In an attempt to keep the child away from the *gher* stove, they had fastened a rope around the boy's leg and tied the other end to the bed. The grandmother described this practice as '*very common in Mongolia*'. The grandmother recounted,

> *They left the gher to count the animals, and they left the boy alone. His mother's uncle was staying with the family at that time. This uncle was the one who left the gher last. He was drinking hot tea and when he left, he left the pitcher with the hot tea just on the floor very close to the baby. The parents had tied the boy to the bed with a rope so that he wouldn't get close to the fire, but the careless man left the tea within reach of the baby. He crawled to the pitcher and pulled it down and burned himself.*
> *He was 1 year and 3 months old.*

The grandmother had taken over the child's care temporarily whilst his parents were attending to their herds and to facilitate the boy's burn treatment at a health facility in Ulaanbaatar.

Decision-making and gender roles

Gender was not perceived to be a dominant issue impeding women's ability to seek healthcare and the fact that the majority of doctors in Mongolia were women, warrants further investigation in terms of its impact on women seeking care.

It was usually the mother, as primary caregiver, who first noticed a child's symptoms. She would inform her husband or close relatives if they were living in the same home. Although family members, particularly husbands, were consulted about children's illnesses, this did not impede a woman's agency to act quickly on behalf of their child when necessary. A mother's decision was often the final one, particularly if the

woman had several children and was therefore seen to be experienced. Mothers also explained that they alone would decide to seek treatment for their children. Throughout the research, it was mothers and grandmothers who brought their sick children to the clinic or hospital and, if the child was hospitalised, would stay until they were discharged. In their focus group discussion, fathers confirmed that it was usually the child's mother who decided to seek treatment, and defined the father's role as supporting the mother's decision.

With regards to labour and delivery, men played a greater role in seeking appropriate care, due in part to the potentially long travel times involved in seeking birth assistance. If a married woman was referred to the provincial hospital from a *soum* health centre, it was common for their husband to accompany them in the ambulance or car provided by the *soum* health centre. If the child was not born quickly, the husband would usually wait in the home of relatives or return to the family home whilst their wife was admitted to the maternity waiting home. Decisions to seek skilled birth attendance included husbands' participation more frequently than decisions to seek healthcare for children at local clinics. In comparison to Khuvsgul, the active participation of husbands was reduced in Nalaikh as expectant mothers lived in closer proximity to health facilities and with access to ambulance services. Seeking care in this urban district was usually initiated after the first signs of labour onset, although the father's role remained largely logistical, telephoning for an ambulance and transporting their wife to hospital.

Healthcare worker, Tsagaannuur *soum* (Khuvsgul Province)

Barriers to care seeking and treatment

Barriers to care seeking and treatment uptake were analysed according to five key themes: financial barriers; access barriers; socio-cultural and religious barriers; knowledge and information barriers; and health facility deterrents. This chapter seeks to highlight the key issues identified for each barrier.

Financial barriers

Significant financial barriers to care seeking and treatment focused on the inability of participants to afford prescribed medicines or medical supplies. When caring for children with multiple illnesses (eg. pneumonia and diarrhoea simultaneously), the financial burden increased. As one migrant mother explained, '*Medicines are very expensive. Sometimes just a little bottle of medicine costs almost 10,000 Tugrik* [5.83 USD] *and if we need vitamins we spend 15,000 to 20,000* [8.75 to 11.67 USD] *for doctor prescribed medicine'*. A Darkhad mother whose child was experiencing both diarrhoea and pneumonia concluded, '*Today I was to pay 7,000* [4.08 USD] *for Amoxicillin syrup but we could not afford this at the pharmacy so we did not buy it'*. Instead, the mother purchased less expensive diarrhoea medicine.

When faced with the inability to pay for prescribed medicines, primary caregivers volunteered four coping mechanisms: selectively purchasing only those medicines they determined to be the most important; purchasing the least expensive medicines; purchasing partial doses only; or prioritising their child's health above their own health or other household needs to make it affordable. The following explanations were representative: '*In our case, buying medicines is very expensive. The boy's parents are not financially stable people*'; '*I choose the most important prescription and try to keep the proper dose for intake*'; '*I recently had to buy pills, 10 pieces, they were 8,000* [4.70 USD]. *I could not afford all of them. I could only afford 5 pieces for 4,000* [2.30 USD]'.

Regarding financial barriers associated with pregnancy and delivery, mothers at Murun General Hospital explained that they were required to purchase certain items or medicines at the pharmacy when the hospital was out of stock. Commonly purchased items included adult Pampers (for recently delivered mothers), iron injections for anaemia, suppositories, and pain relievers.

Although not as significant as the cost of prescription medicines, transportation expenses from the hospital in Murun were described by mothers and fathers as being very expensive. Although transportation to Murun General Hospital was usually by ambulance or clinic car and was therefore free of charge, transportation home was the patient or caregiver's own responsibility. Interviewees cited costs between 8,000 to 50,000 Tugrik (4.70 USD to 29.20 USD) depending on the distance, time of year and difficulty of travel.

The financial barriers identified are supported by UNICEF's bottleneck analysis (UNICEF 2012a) and reflect the fact that out of pocket healthcare spending has increased dramatically over the last decade (Bolormaa et al. 2007).

Access barriers (distance, transport and location)

Access barriers were not reported in Nalaikh due to its peri-urban location, but they were of great concern in Khuvsgul**.** Access barriers were overwhelming for rural herder families who could not reach *soum* centres for treatment. Distance and lack of transport also had a negative effect on the uptake of referrals from *soum* centres to province hospitals. Issues of access were exacerbated during the coldest months of winter and early spring when weather conditions complicate travel. Hospital staff from Tsagaannuur confirmed that in winter '*Reaching Reindeer people who live in the mountain, is very difficult. Some places are not*

accessible by car and even by motorcycles'. Distance was also problematic for herder families in the summer months when they were most likely to travel the furthest distance away from *soum* centres for improved grazing. One Reindeer mother recounted that she had to travel nine hours to the *soum* hospital where she delivered both her children. She explained, '*From our summer place to reach the soum it is all day travel by horse, 9am to 6pm. My two children were born during summer time, so I travelled like this'*. As discussed above, it was also logistically difficult to arrange transportation for health workers to access the Reindeer people. Health workers confirmed that such challenges and long journey times were the determining factors in herder women failing to receive adequate ANC, and resulted in the higher morbidity and mortality rates for children from these ethnic groups. In their focus group discussion, *bagh feldshers* emphasised some of the access barriers they faced.

Feldsher 1: *Bad road conditions are an issue. When patients call doctors for emergency assistance, it takes us a long time to reach those living in remote areas. Doctors face difficulties with transportation. Lots of time is lost because of roads and the conditions of patients get worse.*

Feldsher 2: *All of us present here, we do not only use cars to make our visit. We sometimes ride horses or reindeers to reach the families living in places not accessible by cars. Because of difficulties in access and time lost, children's health conditions worsen, so of course this increases child mortality. Rates of child mortality are higher in our soums because children's condition worsens while waiting for doctors to come.*

The limited budget allocated for petrol was also a challenge in accessing patients and transporting them to the provincial hospitals. *Bagh feldshers* claimed that due to insufficient petrol allowances, they often had to fund their own transport in order to reach rural families in need.

Feldsher 1: *The money provided for our petrol is very small, enough to buy only 15 litres of petrol per month. This only lasts for about one visit.*

Feldsher 2: *Fifteen litres of petrol might finish during one round of visits. Then if we receive an emergency call from a family living far away, we have to visit them. Generally, in our bagh, we use 50 litres of petrol per month. In case of emergency, we have to use our own petrol.*

Feldsher 3: *The government budget is not enough. My bagh has 600 people and the rural condition is very difficult and people move long distances.*

Feldsher 4: *For example newborn babies living in a rural family have to be visited once a week. Of course we don't have enough petrol to visit once a week but people expect us to come. In order to be able to visit them, we have to pay for petrol from our pockets. Often people don't understand the shortages and constraints we face.*

Feldsher 5: *Because of petrol costs we try to take as many as possible Murun in one trip. This is why the duration for some mothers* [travelling to maternity waiting homes] *is earlier than they want to. We can't travel each time when everyone needs to go so we wait and gather everyone in one trip*.

Socio-cultural and religious barriers

Although seeking traditional or spiritual treatment from local healers was common in both Khuvsgul and Nalaikh, the associated socio-cultural and religious practices were generally not regarded as barriers to biomedical healthcare. Both caregivers and health workers perceived the role of the local healers to be quite separate from their seeking treatment at health facilities. Whilst biomedical treatment focused on the body, local healers often provided psychological support to families and were used to cure spiritual sickness. Respected healers also served as important sources of information and advice for pregnant women and mothers caring for ill children.

A number of inherent risks were identified, however, in seeking care from traditional healers. Firstly, misdiagnosis can result in a child not receiving biomedical treatment but being presented to a local healer

instead. Secondly, although related, is the potential for significant amounts of time to elapse between the onset or identification of symptoms and seeking appropriate care, particularly if the child is taken first to the local healer and biomedical intervention is further delayed. Such risks were highlighted when children with pneumonia were taken for 'horse-meat treatment' or for massage to cure diarrhoea (discussed above). The Kazakh healer interviewed confirmed that she would refer patients to medical personnel under two circumstances: because she was unable to effect a cure through spiritual methods; or if a patient's condition did not improve after attempting traditional treatments for two to three days. Both had significant implications for delayed care seeking.

In Khuvsgul, health professionals and the Darkhad shaman discussed other socio-cultural practices as barriers to wellbeing and timely care-seeking behaviour. They described that families in rural *soums* did not practice proper birth spacing and that women maintained heavy workloads throughout their pregnancies, both of which contributed to poor birth outcomes. In addition, they suggested that rural families would not dress their children in attire suitable for the cold weather, and that this led to their contracting pneumonia. In contrast, the majority of caregivers described the measures they took to keep their children warm as an important illness prevention strategy.

Knowledge and information barriers

In general, belief in the efficacy of biomedicine was widespread throughout Mongolia, and advice received from health professionals was seen as valuable. A mother of a child hospitalised due to diarrhoea commented, '*If doctors or medical staff give counselling advice in person we would receive it very close to our hearts. We would remember and take this advice as coming directly from doctors*'.

The majority of mothers described their sources of health information to be the television, brochures or from the experiences and knowledge of other mothers. Most did not suggest the clinic or hospital as a source of health education. As a mother in Murun concluded, she received most of her health information from the television because '*I am not really close to doctors, so I did not get much information from them*'.

Primary caregivers perceived their lack of health knowledge to be caused by doctors neglecting to provide sufficient information and missing opportunities to enter into meaningful dialogue with their patients. Demands for more information regarding pregnancy, birth and newborn health were particularly strong amongst first time mothers who felt they had not received sufficient knowledge from their healthcare providers. Health information during antenatal care visits was related to general health instruction to eat well, rest, take vitamins, and keep warm. As illustrated in the following quote from a mother whose first-born child contracted pneumonia, many caregivers wanted deeper knowledge.

> *For me I had my first baby and lacked information a lot. I used to ask relatives, aunts and older sisters for information. But times have changed now and as far as I know, the number of pregnancy complications has increased in recent years. Pregnant women now have to take folic acid, for example, which was not the case in the past so my aunts would not know. In the beginning, I wanted to go to Enerel family hospital because I heard they conducted some trainings for expecting mothers. But I lived in a different khoroo* [sub-district], *so had to visit another family clinic. I asked doctors here* [Murun] *if they had training. They said they did but it was not offered until very late in my pregnancy… What I missed was, being a first time mother, information on childcare since I had no experience. First time mothers need more information because everything is new.*

For herder women, the most common source of health information was the *bagh feldshers*. As discussed, however, the timing of *feldsher* visits was highly irregular and dependent upon the season, the location of rural nomadic families and, perhaps most importantly, the availability of petrol to access the communities.

Health workers in both Khuvsgul and Nalaikh confirmed that the trainings they gave for pregnant women were poorly attended unless incentives were provided. A health worker in Nalaikh explained,

Once a week we conduct training for residents of our khoroo. Even though many people are unemployed, when trainings are organised, people always say they are busy and can't come. People only come to training if for example World Vision says they will give something, some food or assistance. There is a very passive attitude among people towards trainings. They only come if there is some incentive.

A grandmother caring for a child hospitalised with pneumonia in Nalaikh stated that many family clinic trainings were organised for 1pm, '*but people are busy and cannot come…many cannot attend because they are busy at home and have to work*'.

Health workers also cited their own lack of knowledge as a barrier to providing appropriate information and optimal care to their patients. Midwives and nurses both indicated that they had few opportunities for refresher training, particularly in comparison with the doctors who worked in the same hospital. As a nurse at Murun General Hospital confirmed, '*Capacity building training for nurses and midwives is essential because we don't have this chance very often. Usually, only the doctors go to the trainings. For us, there is not much chance'*.

Health facility deterrents

Health facility deterrents were reviewed as five interrelated areas: environment; lack of medical equipment and drugs; perceptions of poor service provision; concern about misdiagnosis and distrust of prescription; and attitude of health professionals. Whilst these issues may not prevent or preclude attendance at health facilities per se, they were detrimental to positive and timely care seeking and may have negatively affected the quality of service provided.

Environment

In Khuvsgul Province, particularly Tsagaannuur Hospital, the extreme cold, lack of heating and available water was problematic. The hospital's only source of fresh water was the lake, approximately ten minutes walk from the facility, which remained frozen for nearly six months of the year. Health staff in the focus group discussion described,

Health staff 1: *The ice on the lake is sometimes this thick* [gesticulates about a meter] *and somebody has to make a hole and then they have to get the water from deep because so much of it is frozen. Sometimes it may take them one to two hours just to fetch water in winter.*

Health staff 2: *The hole in the ice, if we don't get the water out of it frequently it freezes over and our only choice is to bring ice back to the hospital and wait until it melts*.

The hospital had no central heating system, and relied on wooden stoves located in each patient room as the only source of heating. Staff were required to keep more than ten hospital stoves alight, night and day, throughout the winter. The hospital used 35 truckloads of wood each winter, each load costing approximately 180,000 Tugrik (105 USD). Health staff explained,

Health staff 1: *Sometimes we risk finishing the wood early as there is not enough budget for more wood.*

Health staff 2: *Some people don't understand our challenges, people from cities cannot really understand our situation, having to make a fire all night, make a fire under the car, or bring ice from the lake and make it melt in order to use its water.*

Health staff 3: *In wintertime we all have to wear winter boots inside because it is so cold*.

Health staff 4: *Sometimes we used to bring wood from our own homes to keep the fire in the hospital going. We would bring the wood on sledges over the ice to the hospital.*

Lack of space and overcrowding also challenged the hospital environments. In Murun, the hospital was the referral centre for the other 23 *soums* in Khuvsgul Province, and received all the cases of complicated delivery and child illness that the local *soum* hospitals could not manage. There were not always beds available, and recently delivered mothers often cited their frustration with the crowded conditions. As one mother concluded,

If there are not enough beds and one mother delivers then they put both babies in one bed and the mothers sit next to the bed. It happens frequently. When I delivered there were five people in the room. I became the 6th mother on the 6th bed.

The situation was exacerbated by the ongoing construction, and both patients and maternity ward staff found the long-term renovations disruptive.

Maternity staff 1: *We have only had two beds for the last couple of months because of the reconstructions in the hospital building, but we used to have six beds. By November, if the new hospital is ready, we should not have any of these problems. But now, mothers only stay one night in the maternity home after delivery because the next new delivering women have to come in. So we would like to provide better care and more monitoring but we cannot*.

Maternity staff 2: *Of course it adds so much workload on us. Our facilities, the number of rooms and beds available is not enough. A new maternity waiting home is being built, but each time it is postponed, postponed and now we are told it will be ready in November but we are not sure*.

Poor hygiene and unsanitary toilet facilities were also seen to be problematic. A newly delivered mother recounted,

Just next to our room was the toilet. Before we deliver we have to have an enema so the smell was awful in this room from the mothers. And you couldn't open the window because they don't want the baby and mother to be in the wind, so it was a closed room with a very strong smell. A very unpleasant experience.

In Nalaikh, such environmental constraints were also evident. Maternity staff at the General Hospital explained that in the past, the hospital had a dedicated building for obstetrics and delivery. Since the end of Socialism in Mongolia in 1990, however, their building had been repurposed several times, with each new change further limiting the available space. At the time of the research, the maternity ward had two beds in operation, with an option to borrow two further beds from another ward if required. One mother confirmed that her local clinic had referred her to the General Hospital, but she was sent home by hospital staff because she was not in advanced labour and they had insufficient beds to admit her. The mother was able to return by ambulance later in her labour, and delivered soon after she arrived for the second time.

Lack of medical equipment and drugs

Health professionals also discussed the lack of essential medical equipment. In Khuvsgul, *soum* hospitals were underequipped to deal with obstetric emergencies or acute child illness and lacked newborn warming tables (particularly important during the winter months in the northern *soums*), oxygen and inhalation equipment for treating pneumonia, airway suction equipment and weighing scales.

Caregivers discussed hospital stock-outs when they were required to buy equipment and medication thereby adding further financial burden to seeking biomedical care (discussed above). In addition, hospital staff and health workers in Khuvsgul explained that the cold weather was liable to interrupt their drug supply chain.

Feldsher 1: *Some medicines might freeze during transportation because of time and the cold temperatures. Sometimes, we just have to throw medicines away*.

Feldsher 2: *There is no pharmacy close to hospital. The only pharmacy in our soum is ten minutes walking distance and because it is so cold we might go to the pharmacy to get the medicines, but the medicine freezes by the time we get back to the hospital*.

Perceptions of poor service provision

As discussed above, biomedicine was generally held in high regard, although caregivers questioned the skill and competency levels of health professionals, particularly at the *soum* level. The following quotes from mothers who had been referred to Murun General Hospital were indicative.

The soum doctor didn't really know what to do for the child's spasms [due to lack of oxygen]*, she gave some injections and advised me to come to aimag hospital…Since the soum doctors' treatment didn't help we had to go to the aimag.*

The services at the aimag hospital are better than at the soum. The soum doctor said they could not reduce my child's temperature and could not stop the diarrhoea.

I felt the services provided to pregnant mothers is not adequate. When I was pregnant I had a high temperature and the doctor came and visited me at home. The doctor couldn't tell what was happening and I wasn't getting better. I went myself to the hospital to stay in the hospital and they said it was related to my kidneys, but when I was referred to aimag hospital they said the problem was pneumonia and it was related to the lungs and that is why I had a temperature.

Caregivers also expressed concern about services provided at the referral hospitals in both Khuvsgul and Nalaikh. The ability of nurses to put in an intravenous drip was commented on several times. In Murun General Hospital, one mother explained, '*The nurses had difficulty finding the vein of the baby for injections. They had to stick the child many times and it was painful for her. They don't seem to be very professional*'. This was a view echoed by a migrant mother at Nalaikh General Hospital, '*They had difficulties finding the child's veins. I am unhappy with how long this took*'. Medical staff were equally critical of caregivers who delayed seeking treatment until their child was so dehydrated it was difficult to easily find their vein.

Caregivers also perceived waiting times to be unnecessarily long. A mother attending a family clinic in Murun explained,

For ultrasound and gynecological examination, there were very long queues and to get the appointment time you have to come very early in morning, around 6:30am. For some people husbands or relatives come and queue on their behalf, but in my case I am single and live with my elderly grandfather, so I have to come myself to get the appointment and then wait for the doctors to come. Doctors do not come until 9am. In summertime it is fine, but in wintertime it is very cold and for pregnant women it is very hard to sit or stand for this long.

Another mother expressed similar sentiments,

I had to queue a lot to see different doctors or to have different examination. I had to get an appointment that day and then wait a long time until patients are called by name, by the order in the computer. At each doctor and at each test I would have to wait with several other pregnant ladies. Up to three hours of waiting time.

When questioned about waiting times, health staff in Murun confirmed that they were frequently long.

True, true they come to get appointments for the day. They come at like 6am and at 9am appointment times are distributed and if your time is later then you can go and come back but for those who have a closer time they wait. In total they wait for like 4 or 5 hours.

Some degree of patient concern appeared valid, however, and was reiterated by health professionals who concluded that their busy schedules, heavy workloads, and the lack of health staff, particularly skilled specialists, sometimes prevented them from following best practices. Maternity ward staff in Murun confirmed,

Maternity staff: *Having only one neonatologist for the whole aimag is unacceptable and there are only five gynaecologists for women. That is not enough.*

Maternity staff 2: *Ideally, we work in four shifts of eight hours, so ideally two neonatologists per shift.*

Maternity staff 3: *We only have one neonatologist and this is very difficult because this doctor has to take annual leave sometimes or go to workshops or gets sick herself. Sometimes she has to be away herself and then in case of emergency we have to call doctors from other departments*.

In Nalaikh, maternity ward staff explained,

Maternity staff 1: *If doctors change frequently and their schedules change or they are very busy then the doctors can't be on top of everything. They can't serve the women as well because they are quite busy.*

Maternity staff 2: *Before 2pm we are very busy with examinations and then after 2pm we leave and do home visits or if people have called and asked for a doctor to come to their homes because of an emergency.*

Maternity staff 3*: Our nursing workload is two to three times higher than the international standard per person. Most new graduates don't really want to work in countryside. They work in Ulaanbaatar. Also we have a low salary. Children are not really promoted to become nurses so there are less nurses here. Children don't want to grow up to be a nurse in the hospital*.

High staff turnover and the lack of incentives for new graduates to work outside the urban centres were frequently lamented by health professionals in both Khuvsgul and Nalaikh. *Bagh feldshers* in Murun concluded that young doctors who came to the areas often relocated quickly, '*Young doctors do not stay in these hard conditions for long*'.

Concern about misdiagnosis and distrust of prescription

Caregivers also expressed concerns about the skill level and professional competency of health professionals in terms of potential misdiagnosis, and their resulting distrust of medication prescribed. Caregivers often became suspicious of a diagnosis if a child's condition did not improve as rapidly as they had expected or hoped. Such concern was evident in both Khuvsgul and Nalaikh and was reflected across all levels of service provision. The following statements were representative.

When we first went to the family doctor they examined the baby and said he is ok, but the next day we went to general hospital and the baby was diagnosed with pneumonia… Also, the family doctor only prescribes one medicine for all child illnesses. They prescribe one medicine and ask how is that working? And then they give you another medicine and say how is that medicine doing? So it seems that they don't know what the medicine is supposed to do.

They don't know the medicines to prescribe. They have to be trained more to make proper diagnosis and to know the right medicines to prescribe.

The capacity of family doctors is very weak. When the illness started we went to the family clinic but the medicine they prescribed did not work. My child only got worse.

Caregivers frequently admitted confusion and mistrust over the types of drugs prescribed to their children by the clinic. During one interview, a mother looked through her 'pink book' at the long list of medicines her newborn had been prescribed, and explained how she thought her son '*must be very sick to need all those drugs*'.[2] This was a cause of great concern and anxiety to the family. Her husband who joined the end of the interview added that he did not trust the medicines prescribed by the clinic due to the inconsistency of information provided by clinic doctors. He explained, '*One doctor says one thing and another doctor says something different…One doctor prescribes one strong medicine and another prescribes more and there is so much medicine prescribed*'.

Another mother, whose daughter was admitted to Nalaikh General Hospital for pneumonia, recounted,

I'm a first time mother and the doctor prescribes so much medicine to my child. My girl had so much medicine to take and the side effects of all of these drugs was really quite strong. The doctor prescribed different types of antibiotics and medicines and now my baby is allergic to many of these medicines. Because I am a first time mother I don't know about these medicines and these drugs and what to give or not.

Caregivers' decisions about what prescribed medicine to give their children, were not only made in relation to cost (as discussed above), but also determined by their level of trust in clinic recommendations. A pharmacist interviewed at a large, modern and well-stocked pharmacy in Nalaikh confirmed her professional concerns about the drugs routinely prescribed to children. She noted, for example, that many parents with young children under two years old frequently presented prescriptions for Imohpec, a medicine used to treat diarrhoea in patients over two years old. She explained that in such cases, she would counsel parents that this was the wrong drug to prescribe to their child and would advise them to use an alternative. During the interview, a mother with a one-year-old child showing signs of an infection came to the pharmacy with a prescription for her daughter. After reading the prescription, the pharmacist asked the mother how old her child was, and then suggested a drug more suitable to the child's age. The mother accepted the pharmacist's advice and stated her displeasure with the doctor who had originally prescribed her the medicine. The pharmacist concluded,

Family doctors prescribe for very young children. I tell parents they should not give this medicine to children under two, but parents sometimes do anyway because family clinics prescribed it or because they have always done it this way and they say no harm has ever come to children as a result.

Attitude of health professionals

Although provincial level hospitals were generally regarded as superior to *soum* hospitals, caregivers often criticised medical staff at the referral centre for being '*too bureaucratic*'. This term was used to refer to doctors who had a brusque manner, were critical of a mother's care, or who did not take the time to properly explain the condition or provide health information. Although it was a common critique, '*being bureaucratic*' did not appear to deter caregivers from seeking treatment or their perception that a higher quality services was provided at the provincial level. In fact, many mothers attributed the overly bureaucratic nature of doctors to their higher skill level and demanding workload.

[2] This was a small booklet, pink in color, given to all Mongolian women at their first antenatal care visit. The book provided information about pregnancy as well as space to record a child's appointments and prescribed medicines.

Despite this, many caregivers claimed that health professionals displayed poor, uncaring or negative attitudes towards their patients and lacked effective communication skills.

In the aimag, I felt like doctors were harsh with me. Not as friendly as soum doctors. They ordered me to go on the bed by myself when I was in so much pain during labour. The communication of the doctors there was not as good as soum doctors. The reason might be that the aimag hospital is a big hospital, doctors are confident. The aimag is a good hospital, the doctors are confident and maybe this is why they are more harsh.

I had a tough experience in the city [Ulaanbaatar]*, maybe because of the doctor's load. There were so many women and babies. Both in the aimag and the city the doctor's communication is not nice, maybe it is because they are so much loaded with work… Doctors are always criticised in maternity homes for shouting and this kind of behaviour.*

The worst time I had was spent in the maternity ward. No one tells you what is happening, what to expect. There is such a lack of information and counselling by doctors. They have a careless attitude toward patients and don't explain anything to us.

We lack knowledge. When we have some complications, when we feel not well, we don't know about these things so we just discuss such issues amongst ourselves. When we ask other mothers, we all provide different answers. So we don't know what is the correct answer.

Many caregivers confirmed that they had little knowledge of what procedures were being carried out, or why, whilst they were in hospital. One recently delivered mother described, '*After the birth, the doctor gave me an injection and left. For two days I didn't even see a doctor*'. Similarly, a mother in Nalaikh explained, '*The doctors checked on the baby but they did not ask how I was doing. I was worried that my breasts had not produced any milk yet, but they did not ask*'. A Reindeer mother caring for a child with diarrhoea emphasised, '*When we come to doctors, mostly they prescribe medicine and that's it. There is not much counselling*', whilst an expectant mother admitted to the maternity waiting home concluded, '*In most cases, I just try and do things myself, try and figure things out myself*'.

In both areas, caregivers described ways in which health professionals favoured certain patients, such as allowing friends or relatives to jump the queue, '*It happens a lot that I am in a queue and someone who knows the doctor gets to go in front of me*'. In Nalaikh, however, other more concerning discriminatory practices were evident, particularly in relation to migrant women. These caregivers often found it difficult to access healthcare in an area different to that listed in their paperwork and were frequently chastised by staff for not having the correct documentation. One migrant mother explained,

Because I am a migrant, I am not registered here. The doctors say you have to be a citizen of this district otherwise all of the expenses of your treatment come to them, meaning to the hospital. They always say please change your address and get registered here. Doctors treat better those who are permanent residents in their khoroo [sub-district]*. Some outside people like migrants are sometimes not treated as good as the doctor's residents.*

Although a small number of interlocutors spoke Kazakh, language was not seen to be a barrier to healthcare access, as all participants communicated fluently in Mongolian using commonly understood vocabulary for child illnesses and newborn complications. Similarly, neither religion nor ethnicity were found to be the root cause of discrimination or stigma. Discriminatory practices mentioned by migrant mothers were based on accessing care in a district other than their own, rather than intrinsically linked to their ethnicity. All stakeholders were in agreement that ethnic discrimination was not a factor in the provision of health services.

Kazakh mother and child, Nalaikh General Hospital (Nalaikh District)

Solutions to barriers identified and drivers to care seeking

Having highlighted the barriers and deterrents faced by caregivers in seeking treatment for childhood pneumonia and diarrhoea and in relation to skilled birth attendance and newborn care, participants were also asked to share ideas and possible solutions to overcome the challenges identified. They were encouraged to consider what, from their perspective, would lead to the adoption of healthy behaviour and appropriate and timely care seeking for childhood illness. Although practical measures to improve care-seeking behaviour were suggested, caregivers found it difficult to discuss solutions in the abstract, particularly in relation to financial and socio-cultural barriers.

Focus group participants, particularly clinic and hospital health professionals, were adept in listing practical institutional solutions to increase their care-delivering capacity. Solutions to health facility deterrents and knowledge and information barriers elicited the most animated and detailed responses. Similarly, *bagh feldshers* forwarded ideas in relation to their own work and difficulty in accessing remote populations. All suggested solutions were analysed in relation to qualitative and quantitative data collected through the study. For ease of reference, the solutions raised by participants are presented according to the five thematic barriers identified in relation to care seeking and treatment. A summary is presented in Table 4 at the end of the chapter.

Solutions to financial barriers

In theory, government health services are free at the point of service delivery in Mongolia. Further, all primary caregivers interviewed with children aged over five months received a small monthly government allowance (20,000 Turgrik per child, approximately 11.60 USD). Reindeer families also received an additional 130,000 Turgrik (76 USD) per adult and 65,000 Turgrik (38 USD) per child each month in recognition of their difficult living conditions. Despite this, financial outlay was often required for transport, small items of medical equipment and drugs from the public pharmacies that operate for profit outside the free governmental services.

Caregivers found it difficult to envision how their financial constraints could be alleviated, beyond facilities providing medical supplies and medicines when necessary. In Khuvsgul, the *soum* hospitals provided free transport to the *aimag* hospital, but no participant suggested extending this service to return patients home as a way of mitigating transport costs. In Nalaikh, pharmacists discussed the provision of subsidised medicines for qualifying families at four pharmacies in the town, yet no caregiver or health professional appeared to have knowledge of this. In Mongolia, the lack of women's economic empowerment was not an obvious financial barrier and was not discussed by participants.

Solutions to access barriers

Mongolia is a large country with a low population density. Linking disparate and nomadic communities with urban or peri-urban centres requires navigating long distances over difficult terrain. The challenge to effective coverage is exacerbated by the harsh weather conditions that quickly erode paved roads and prevent movement between areas. Car travel from *soum* centres to remoter regions where herder families reside is often not possible, even in good weather. Improvements in access and coverage would therefore require huge investment in the country's infrastructure beyond the remit of the health system alone. Mongolians have developed coping strategies and use alternative modes of transport, such as horses, reindeer and, when possible, motorbikes. These modes of travel are also employed by the *bagh feldshers* who are tasked with providing healthcare to Mongolia's most difficult to access population.

It is unsurprising, therefore, that when asked how to improve healthcare access for herder families, 100% of respondents suggested increasing the capacity of *bagh feldshers* as the most obvious and reasonable solution. As one Reindeer mother caring for her child with diarrhoea attested, it would help if, '*Bagh feldshers could visit remote families more often and maintain close communication, and also give more counselling when they visit*'. Similarly, a mother of a child hospitalised with diarrhoea in Murun explained,

If bagh feldshers would visit more frequently it would be very helpful. For herders and people living outside the soum, if diseases seem to be not very serious they don't come to hospital. They don't complain and they don't come to soum… If doctors would come more frequently they would describe their problems more fully and would be able to talk about the illness that they don't come to soum hospital for.

Increasing the capacity of *feldshers* to frequently visit pregnant mothers and families with ill children would increase the number of women's antenatal care visits, likely reduce the number of patients requiring hospitalisation (through preventative care and health education), and potentially lessen delays between symptom onset, recognition and intervention.

Solutions to socio-cultural and religious barriers

Healthcare professionals identified three potentially harmful socio-cultural practices: improperly dressing children for winter conditions; the intense work practices of pregnant women (particularly herders); and the use of Kazakh healers by Kazakh caregivers. The proposed solution to all three was succinct: increase caregiver education. Improving health education was seen to be a priority, but the inference made by health professionals was the need to first improve women's overall educational status (discussed further below).

The need for health education to overcome socio-cultural and religious barriers focused mainly on practices related to traditional Kazakh healers. Although it was clear that obstetric complications required health facility attendance, visiting a healer for childhood pneumonia and diarrhoea could lead to incorrect diagnosis, mismanagement and delayed care seeking. Nalaikh health workers suggested that targeted health messages would help to overcome such practices, particularly if focused on the predominantly Kazakh *khoroo*.

Solutions to knowledge and information barriers

As discussed, the use of biomedical services (where and when accessible) was widespread throughout Mongolia for a variety of factors, not least the long history of socialist medicine. Building upon this theme of pre- and post-Soviet era health knowledge among primary caregivers, one *bagh feldsher* described,

Many of the young parents today, they went through hard times of the transition period in 1990s. Many of them dropped out of school during the transition period and their education level is limited. There was a gap in knowledge during this time that is becoming apparent to me as I see a knowledge gap in mothers from this time.

Adding to the discussion of how women's overall higher education levels would lead to healthier children, another *feldsher* concluded, *'Improving women's health is the most important thing. If mothers are healthy, babies will be born healthy. Making women healthy is the priority. Start from when they are adolescents so they learn best practices'*.

Recommendations for health education activities focused on increasing the quality and quantity of promotional material, such as information brochures and the 'pink book'. A *bagh feldsher* working in Khuvsgul explained,

The pink book is a good source of information for mothers. It helps us a lot because it helps us to see how we should be counselling mothers. Also, it is good for the mothers to read as well. People are mostly literate. Most women are literate.

Similarly, a midwife at Murun General Hospital concluded,

We always face lack of ICE [information, communication, education] *materials, we always lack materials to distribute to mothers. Like when we meet them or if hospitals meet with them and give them some reading materials, of course if they are relevant to them they will read. The pink book, mother and child health book, is a good source of information. But some mothers don't know and don't read. Mothers don't read the pink book so maybe the family clinics are the one who should really promote reading the book.*

Listing a child's immunisation schedule in the pink book also served as important referral information for migrant mothers. It is also worth noting here that while migrant mothers in Nalaikh often discussed delays in treatment due to citizenship in a different district, no mother experienced delays in child immunisations for this reason. If their 'pink books' indicated a next vaccine was to be received, then it was given without delay. Regarding the information provided in her 'pink book', one new mother in Murun, explained its content was useful, '*Since I have nothing else to read, this is the only information provided to me'*.

Health professionals also suggested the use of visual communication methods to increase knowledge and awareness. A member of staff from Tsagaanuur hospital explained,

If health related videos or recordings can be shown while people are waiting in the corridor that would be good. People often have to sit and wait here for their appointments, so if they could watch TV while they wait it would be helpful. But we don't have the money to afford a TV.

Caregivers confirmed the efficacy of engaging visual communication materials. One mother at Nalaikh general hospital explained, '*TV is a good source of information. Even in the very remote areas people have access to television*', whilst another at Murun hospital confirmed she had learnt about the benefits of taking folic acid through watching 'Jargalan' (meaning 'happiness'), a programme on Channel 25 targeting pregnant women (discussed further below). Some caregivers received the majority of their information from printed materials, but others suggested, in contrast to the *bagh feldsher* in Khuvsgul quoted above, that '*Visual posters with health information would be good because some people cannot read properly*'.

Whilst secondary sources of information were thought to be useful, caregivers emphasised that they should be used to supplement rather than replace direct communication between doctors and their patients. As one Khalkh mother of newborn twins concluded, '*Mostly I believe that compared to reading printed materials, face-to-face counselling would work much better for us'*. From the caregivers' perspective, solutions to improve the lack of information and health education provided at health centres focused predominantly on improving the counselling and communication skills of healthcare providers. In relation to doctors being 'too bureaucratic', caregivers suggested that doctors should be trained in better doctor-patient relations. A mother hospitalised with her child in Nalaikh general hospital articulated the commonly held view, '*If doctors cannot communicate well, they cannot do their jobs properly*'. Hospital staff in Tsagaannuur were the only healthcare providers to suggest a corresponding '*two-way communication between doctors and community*'.

Several participants suggested increasing the capacity of *bagh feldshers* in their outreach activities with rural communities as a method for improving knowledge and information amongst herder communities. *Bagh feldshers* themselves requested more training on newly emerging diseases and viruses causing respiratory infections in order to better understand changing seasonal patterns observed in their areas. Additional training was also requested by other health staff, particularly maternity ward nurses and midwives who were eager for more knowledge to improve their service delivery.

Solutions to health facility deterrents

In relation to health facility deterrents, participants discussed improvements to three main areas: personal interaction and timings; environment and infrastructure; and clinical skills.

In response to the harsh treatment caregivers perceived they received at health facilities, and the long waiting times, it was suggested that more highly skilled doctors be hired to lessen the heavy workload of existing hospital staff. Caregivers hoped that this would relieve staff of the inherent pressures that contributed to the poor attitudes of health workers. Caregivers also suggested methods for increasing the efficiency of clinic appointments, particularly for ANC and the treatment of child illness. One idea was to allocate appointments in advance to avoid mothers waiting in long queues, prevent discriminatory scheduling practices, and to enforce family doctor work schedules. A mother in Murun who was seeking treatment for her child with pneumonia commented,

Even if you come early in the morning sometimes the appointments distributed are not enough and you have to come back another day. It would be good to allocate appointments in advance so we do not have to wait in line for so long and maybe not even get an appointment. This is something that should be fixed.

More controversially, a mother of a child hospitalised with pneumonia in Nalaikh general hospital, suggested that a doctor's performance should be monitored.

For the registration of doctors working times, some monitoring should be done to improve it, have them register the time with their fingerprints so that it is known when they go out and come in. Or maybe doctors' salaries should be based on patient reviews.

Health professionals discussed the need for the government to secure more realistic budgets for medical supplies and essential equipment, particularly at *soum* hospitals, to ensure facilities could appropriately treat newborn complications, pneumonia and diarrhoea. The need for improved infrastructure was emphasised in Khuvsgul to enable positive working environments with a reliable water supply and heating source, rather than being dependent on thawing frozen lake water or costly expenditures on wood-burning stoves (the latter also being an environmental hazard). *Bagh feldshers* and *soum* health staff both suggested better insulation of medicines during transportation, to avoid drugs being discarded due to freezing. Health staff in Murun general hospital also stressed the need for improved infrastructure. Completing construction quickly would avoid further disruption to services and provide an additional maternity waiting home to increase the hospital's capacity for caring for expectant mothers. They were keen to have a building dedicated to obstetric care and suggested that renovations should upgrade the outdated Soviet-era health facilities to better reflect contemporary needs.

Increased training for family clinic staff, particularly in relation to prescribing practices for children under two was suggested by health professionals, particularly in Nalaikh, whilst maternity ward staff at Murun general hospital specifically requested the need for two neonatologists per shift (this would mean the hospital employ eight neonatologists, whereas at the time of the study they had one). Health staff also discussed the need for increased salaries and incentives to encourage qualified staff to be deployed in rural areas and districts outside Ulaanbaatar (such as Nalaikh).

It was acknowledged that many of these large-scale institutional issues were deeply entrenched and that solutions proposed were not necessarily feasible. Failure to address systemic challenges, however, was seen to be a significant factor in contributing to ongoing future problems. As a nurse working in Nalaikh general hospital concluded,

The Ministry of Health and other NGOs have conducted various surveys to find out the reasons of the high nursing workload. Even they acknowledged that there are a lot of problems related to nurses' work. They have conducted salary surveys. But due to insufficient budget they cannot really solve all these issues. But

even for this year we have heard there are more budget cuts, because of the economic problems of the country. All these reasons are scaring our new generations to become a nurse. The problem still exists.

Additional solutions

The solutions presented above and summarised in Table 4 (below) were forwarded by participants of the research. In addition, there were a number of potential solutions that were identified by the research team during data analysis.

In terms of increased access to medication, pharmacists in Nalaikh suggested that subsidised medicines were available from selected pharmacies. If the medicines were good quality and the supply was reliable, caregivers should be made aware of their availability to help overcome financial barriers. This warrants further investigation.

Hospital vehicles (ambulances, clinic cars) used to transport patients to health facilities should be maximised. Opportunities to return patients to their homes after treatment should be explored. For example, if a clinic car from a particular *soum* delivers a patient to the health facility, it should not return without passengers, but provide transport to any patients at the health facility needing to return to the *soum*. This would require increased coordination, but should be feasible. If appropriate, passengers could be asked to contribute to the cost of petrol. This cost may be substantially less than funding their own transport home and would likely be of greater convenience to the patient. It may also provide the health facility transport with a small revenue stream to help fund the cost of petrol. In addition, increased institutional support for *soum* health centres (particularly in terms of petrol costs) would enable more clinic cars to be in circulation, reducing the need for vehicles to wait until they are full before they transport patients to province hospitals.

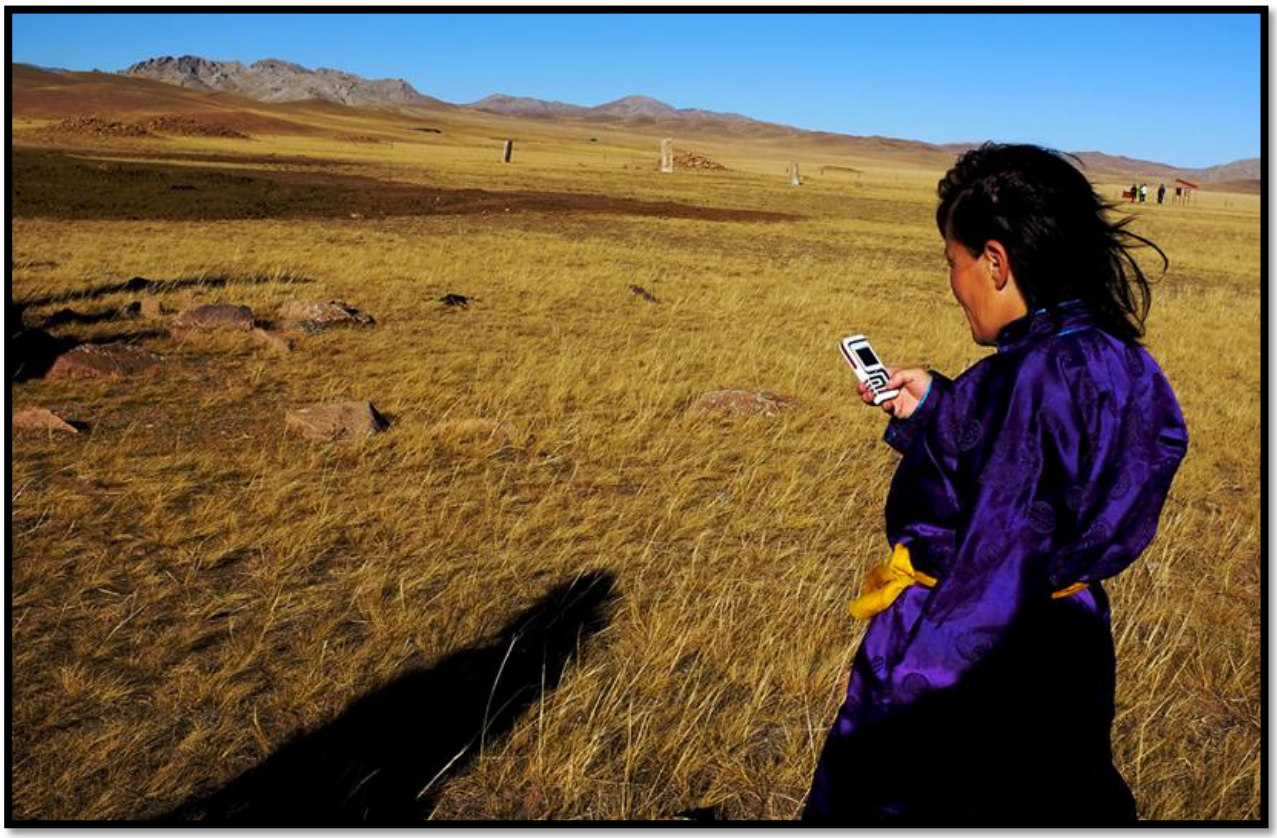
With regards to outreach, the provision of frontline health services and key health education, *bagh feldshers* should receive training to advance their competency (such as paramedic skills) and to increase their capacity to deliver health services in operationally challenging circumstances. They should be supported with training in communication and counselling skills to enable them to provide health education at the community level.

The timing of health education sessions held at health facilities should be more appropriate to the daily and seasonal schedules of the target beneficiaries. When, where and how health education is delivered should be contextualised by work commitments, cultivation times and nomadic patterns.

Darkhad and Kazakh healers serve as important and trusted sources of health information, and would benefit from basic training that foucses on appropriate and timely referral processes. Key C4D objectives for Mongolia intend that mothers of children under five, as well as mothers-in-law and husbands, will know the danger signs of pneumonia and be able to seek timely care and support from appropriate healthcare providers. This objective could be expanded to include healers in order that they can identify symptoms and encourage timely referral. Similarly, health professionals should be encouraged to have a better understanding of Kazakh and Darkhad healing practices to clarify any potential misunderstandings (such as the interpretation of what happens in the first forty days of infant life as discussed above).

Table 4 – Barriers and solutions identified by participants

	Identified barriers	Suggested solutions
Financial	- Inability to afford transport costs - Inability to afford prescribed medicines - Inability to afford medical supplies	- Ensure supplies are in place and are available for free at the point of service delivery in government facilities - Subsidise medicines at selected pharmacies
Access	- Distance to facilities, particularly for herder families (seasonal) - Lack of available transport (for both patients and *bagh feldshers*) - Poor road conditions	- Increase the capacity and coverage of *bagh feldshers*. This would increase antenatal and postnatal care, improve health education provided at a community level, lessen the intervals between symptom onset, recognition and treatment, and potentially reduce the number of patients requiring hospitalisation. - Increasing their operations would, however, require additional resources, such as petrol money (already a constraint on effective coverage).
Socio-cultural and religious	- Use of Darkhad and Kazakh healers may delay biomedical intervention - Dressing children improperly for cold weather conditions - Heavy workloads of pregnant women, particularly herder women	- Increase the level of women's education in general - Increase the level of health education to overcome specific practices (failing to dress a child in warm clothes; lowering the work burden of pregnant women; encouraging patients not to visit Kazakh healers).
Knowledge and Information	- Neglected opportunities for doctor/patient communication - Lack of strategic and targeted health education for primary caregivers - Limited outreach - Inconvenient health education sessions at facilities - Lack of training opportunities for midwives and nurses - Limited communication and counseling skills of health professionals	- Need for further health education - Increase quality and quantity of communication materials including printed matter, posters and visual media (promotion of the 'pink book' and targeted television programmes) - Improve communication and counselling between doctors and their patients - Increase the capacity and coverage of *bagh feldshers* to provide knowledge and information, particularly to herder communities - Increase training of health professionals to upgrade their skills and deliver better services - Restructure health education sessions held at facilities to be more appropriate and better timed
Health facility deterrents	- Supply-side issues including lack of medical equipment and drugs - Environmental issues (overcrowded facilities, poor sanitation, limited water and heating) - Perceptions of poor service provision - Concerns about diagnosis and health staff competency - Distrust of prescriptions - Long waiting times at clinics (including delays regarding migrant mother's paperwork) - Poor attitudes of health staff (including harsh behaviour and favouritism) - Staff shortages, high rates of turnover and heavy workload	- Improve supply chain management - Invest in physical infrastructure to improve capacity (complete renovations) - Refresher training and continual professional development for health staff - Improve prescription practices (particularly for children under two years) - Improve interpersonal communication skills and develop trust between patients and health professionals - Improve appointment systems to avoid long waiting times and favouritism - Provide incentives to encourage health staff to work at rural centres and reduce health worker case burden



Outside Murun near ancient Deer Stones of Uushigiin Uvur (Khuvsgul Province)

Technology use for behaviour change communication

mHealth overview

In recent years, innovative technological solutions have been proposed, piloted and monitored for extending the coverage of skilled healthcare to include even the most remote areas. One of the most promising initiatives is mobile health, or mHealth: health related practices that are supported by mobile devices providing a direct link to the target beneficiaries for the use of data collection, real-time patient monitoring and healthcare communication. The World Health Organisation defines mHealth as 'medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices' (WHO 2011). With approximately 5 billion mobile phone users globally, 73% of whom live in developing countries, the role of mobile technologies in both preventative and curative health services, particularly in low- and middle-income countries (LMICs) is steadily increasing (Marshall et al. 2013). Nearly 90% of the world is now covered by a wireless signal, ensuring that formerly isolated individuals, such as herders in northern Mongolia, have the potential to access these technologies (Lemaire 2011). mHealth can also support health workers, particularly in rural locations with limited infrastructure where community health workers may be the vital link for patients to access correct and timely treatment (Mishra and Singh 2008).

mHealth has the potential to address many of the challenges faced by weak and under-resourced health systems including shortages of skilled workers; lack of timely reporting for surveillance and diagnostics; poor treatment adherence; and poor inventory and supply chain management (Marshall et al. 2013). Uptake has been especially high in emerging markets, where limited landline infrastructure has led to greater reliance on mobile networks for everyday communication (Mechael 2009). In fact, the ability to serve areas lacking landline infrastructure can be helpful in terms of disease surveillance as mobile Global Positioning System (GPS) technologies can assist in the triangulation and tracking of outbreaks and epidemics (Marshall et al. 2013).

Free et al. (2013) note that the amount of information and support that can be conveyed to individuals through traditional media, such as leaflets, or even basic medical consultations with professionals, is often limited, but that mHealth has the potential to deliver health messages to people anywhere and at the most relevant times. mHealth breaks down financial barriers as well as those caused by lack of education and community values, and is able to reach families and communities as a whole. As Källander et al. (2013) conclude 'By harnessing the increasing presence of mobile phones among diverse populations, there is promising evidence to suggest that mHealth can be used to deliver increased and enhanced healthcare services to individuals and communities, while helping to strengthen health systems'.

Leroux and Rivas (2013) look to mobile phones as behaviour change communication devices, highlighting the need for simple but effective messages relating to hygiene (washing hands with soap, cooking food properly, washing fruit and vegetables) as assistance in combating a high prevalence of diarrhoea to achieve the biggest impact at the lowest cost. Short Message Service (SMS) interventions have been shown to increase adherence to antiretroviral therapy in low income countries and smoking cessation in high income countries (Free et al. 2013). SMS has been forwarded as the most simple and cost-effective mHealth measure, although challenges have been noted in fitting health messages within the 160-character limit of text messages, particularly when a project's catchment area contains more than one spoken language, and Mechael et al. (2010) highlight the need for more sophisticated, patient-specific messaging systems to be developed.

It is estimated that 30–70% of all health Information Technology (IT) projects fail (Kaplan and Harris-Salamone 2009), and it is reasonable to expect that mHealth projects would parallel this experience (Marshall et al. 2013). Several authors have commented on the fact that the majority of mHealth evaluations have focused on interventions in the global North, thus providing little evidence for efficacy in

LMICs (Gurman et al. 2012; Free et al. 2013; Mechael et al. 2010). In addition, a large portion of the research is concentrated solely on initiatives corresponding to HIV/AIDS, tuberculosis and malaria, and it remains unclear whether the effectiveness of these interventions is influenced by setting or participant demographics. Whilst the integration of mHealth into prenatal and newborn health services has demonstrated some positive early outcomes in some contexts, evaluations of sustainability require further feedback from ongoing programmes (Tamrat and Kacknowski 2012). Studies are yet to prove that social behaviour change communication (SBBC) through mHealth result in significant effects on the intended audience (Free et al. 2013). The initial signs are positive, however, and mHealth has an important role to play in accelerating progress towards the MDGs.

Mapping the mobile landscape

In light of the potential benefits of mHealth technology for reaching rural or marginalised populations in Mongolia, the research team collected data relating to the target populations' mobile phone use and preferences as well as additional data related to television, internet and radio. This chapter collates qualitative data from in-depth interviews and focus group discussions, and quantitative data collected through the technology surveys (see Appendix 3 for the questionnaire). Supplementary material was also gathered through informal interviews with mobile phone credit providers.

There are four mobile service providers operating in Mongolia: Mobicom, Unitel, Skytel, and G mobile. Skytel and G mobile also offer modem-based Internet services and in addition, G mobile sells an antenna-based 'home' phone for use in rural areas where there is no cellular coverage.

Across Khuvsgul Province, service provider coverage differed significantly. Only Mobicom and Unitel were active in Tsagaannuur via independent dealers selling mobile phone credit. Mobicom dealers were more prevalent than Unitel by a ratio of four to one. Credit units were sold in 2,500 Turgrik (1.45 USD), 1,000 Turgrik (0.58 USD) or 500 Turgrik (0.29 USD) bundles and one minute of talk time cost approximately 75 Tugrik of phone credit. Anecdotal and observational data from mobile credit shop owners suggests that women are by far the largest customer base, purchasing credit for both themselves and their families.

Eight caregivers surveyed in Khuvsgul Province each owned two phones, one on the Unicom network and the other on either Mobicom or G mobile, in order to take advantage of both service providers. Unitel appeared to have better service plans for making calls, as calls to other network users were free, whilst Mobicom had more attractive call receiving options. G mobile phones also offered a service whereby calls could be received even when no credit was charged to the phone. In Renchinlkhümbe, Mobicom, Unitel, Skytel and G mobile were all operative. Because of their capability to make and receive calls outside mobile coverage areas, G mobile home phones were used predominantly in remote areas. Skytel coverage in Renchinlkhümbe was reported to be very low and was rarely used by residents. Again, the majority of mobile credit customers were reported to be women and, as in Tsagaannuur, it was not uncommon for families to have multiple mobile phones per person or per family to take advantage of the different service packages. The four providers all had good coverage in Murun and maintained official stores where a customer could buy both a phone and credit, rather than relying on independent credit dealers as in Tsagaannuur and Renchinlkhümbe.

In Khuvsgul Province, Mobicom had been in operation for 15 years, longer than any other service provider. Mobicom and Unitel appeared to be the largest providers with more mobile credits sold per month than either Skytel or G mobile. The same four service providers were also operational in Nalaikh District and each maintained at least one official store. Again, Mobicom and Unitel were the largest providers in the district with most mobile credits sold per month.

Overview of current mobile health opportunities and constraints

In Khuvsgul Province, all but one mother interviewed owned a mobile phone for her personal use, and she would borrow her sister-in-law's if necessary. Similarly, all health personnel and *bagh feldshers* interviewed, plus the Darkhad shaman, had a personal handset. The majority of respondents claimed to have used their phones to contact health workers in the past, although no caregiver had been telephoned by a public health worker. Only one mother who attended a private clinic for ANC reported to have been contacted by the clinic to remind her of an upcoming appointment. Pregnant mothers admitted to the maternity waiting home in Murun described using their moble phones to keep in contact with their husbands and families whilst they waited to deliver.

In Tsagaannuur hospital, the first static phone line was installed in 2012. It was monitored by on-duty hospital staff and used primarily by patients needing to contact the hospital. Staff explained that they would only call a caregiver to remind them of their child's vaccination (discussed above).

Maternity staff often gave out their personal phone numbers to recently delivered women so that mothers would have a direct point of contact and the staff would be able to answer questions once their patient had been discharged. A nurse participating in the focus group at Murun General Hospital confirmed that she would receive frequent calls from new mothers asking questions about their child's health. Her colleagues countered that mothers should direct their questions towards their local family clinics and not hospital staff as '*we sometimes don't have time to answer the phones because we are so busy with our jobs*'.

In Nalaikh, all respondents confirmed they had a personal mobile phone. The one exception was a migrant mother whose husband was most often in possession of their phone as safety precaution in his dangerous work conditions as an unsanctioned coal miner. The Kazakh healer interviewed as well as maternity nurses and family clinic staff all had phones for their own personal use. The majority of women reported having used their cell phones to call health workers or ambulances when necessary. Only one mother had never called the clinic or hospital because, as she explained '*I know that antenatal visits at the family clinic are on Tuesdays and Thursdays*'. Again, health workers were likely to telephone mothers to remind them of scheduled vaccinations, and two mothers confirmed that they had been called by clinic staff to attend ANC. As in Murun, maternity staff from Nalaikh General Hospital took the position that the family clinic was responsible for follow-up, adding that mothers should only contact the hospital for emergency assistance.

One mother interviewed at Murun General Hospital was from Tsagaan Uul *soum*, approximately 160km from Murun. She described having a G mobile 'home' phone with an antenna for the purposes of communication. The family purchased this phone during her pregnancy to access emergency medical services if required.

To get cell phones to work in our area we have to climb hills, but, because of the small baby, we wanted to have a connection, a better phone. This is why we bought the phone… If the doctor's phones are busy or switched off we can also use the phone to call relatives.

Bagh feldshers confirmed that in the remote areas where they worked, it was necessary to 'climb the mountain' in order to find good network coverage and reception.

The other method of communication used by Tsagaannuur hospital staff to monitor the emergency medical needs of Reindeer herders living in Taiga was two-way-radio. Contact between the hospital and the central Reindeer camp was scheduled for 10am and 2pm every day. At other times the radio was turned off to preserve its batteries. If somebody from the Reindeer people had a medical problem and was unable to travel to the *soum* hospital, they would radio for assistance. A *feldsher* would then meet the patient at a prearranged time and place, most often the point where it became inaccessible for motorbikes or vehicles. If the patient was unable to travel, then the *feldsher* would be met by somebody from the camp, and they would ride back to the Taiga together on reindeer. This was a lengthy journey that, depending on weather conditions and the time of year, could take anywhere from several hours to several days to complete.

Forty-five technology surveys were administered in both Khuvsgul Province and Nalaikh District. In Khuvsgul, 41 respondents owned a mobile phone for their own personal use and 43 respondents in Naliakh. In total, 93.3% of the 90 participants polled had their own mobile phone. In both districts, the majority of mobile phone users were married and cared for between one and ten children. The few participants (n=6) who did not own a phone confirmed that they could easily use a friend's or relative's in an emergency.

60.7% of respondents used a prepayment system, with the most commonly purchased credit denominations being 1,000-2,000 Tugrik (0.58 – 1.17 USD). When questioned about the available credit on their phone at the time of the survey, 16.6% claimed to have no credit. The phones of all respondents could receive calls (with and without credit) and make calls (with credit). Table 5 summarises the service providers used by respondents of the technology survey.

Table 5 – Mobile phone providers

Service provider	% of technology survey respondents
Unitel	47.6
Mobicom	33.3
G mobile	6.0
Skytel	3.6
Double networks (eg. Mobicom and Unitel)	9.5

With regards to text messaging, over 97% of respondents had a mobile phone that was capable of sending and receiving text messages. Only 7.1% preferred phone calls to text messages. 75% of those polled texted their friends and families, but 15.5% of respondents were unable to type a text message.

A summary of key data related to mobile phone practices (both calling and texting) is presented in Appendix 7. The tables include demographic details of each caregiver who participated in the technology survey (location; ethnicity; age; relationship to child; highest education level obtained; monthly income range) and their approximate monthly expenditure on phone credit. The tables capture who the caregiver most frequently called and sent text messages to, and who they received calls and text messages from. Additional technology data (provided in subsequent tables) details how often television, radio and internet were used; favourite programmes; approximate time of day of usage; and duration spent using different technologies.

Other technologies

Television

Television use was widespread in Mongolia. Even rural herder families living far outside *soum* centres often had televisions powered by solar battery. One Reindeer mother speculated that at least half of all Reindeer families in Taiga had televisions. She thought news programmes were the most frequently watched genre among herder families in her group. Several pregnant mothers in Murun, particularly first-time mothers, described watching health programmes targeted at expectant mothers. One Khalkh mother explained,

> *There is a programme where doctors are interviewed, I cannot remember the name, but it was doctors who were interviewed and giving advice. The programme said that newborn babies need to have their nose and ears cleaned and things like this… it was my favourite programme.*

Maternity ward staff at Murun General Hospital suggested that more television programmes dedicated to health should be aired.

Maternity staff 1: *TV is a really good source of information. But there are so many commercials on TV. Instead, useful information on newborn health or information for mothers and families would be good.*

Maternity staff 2: *Mothers really watch TV and get information from TV. In addition, family members would also see and get information.*

During a focus group discussion with mothers, television was described as the '*best method of communication*' across Mongolia because '*Even in the very remote areas, people have access to television*'. The National Broadcasting Channel was mentioned specifically as the best placement for health programming.

Mother 1: *When we have Korean soap operas, people know what time to turn the television on and to what station. If we have set programme times for health education programmes, then mothers would watch these programmes. They would know when to watch.*

Mother 2: *My mother calls me and tells me when a programme is on that I should watch. Otherwise I wouldn't know because there is not a set time for this programme.*

Mother 3: *Pregnant mothers might watch these programmes if there were fixed times since they have time. Mothers cannot browse various channels when we are at home doing something. We have TV on while we are busy in the home, so we do not search for programmes on the television, but if we know that something will be on at a certain time then we would watch it. We would be able to programme the TV properly and continue our work.*

In Khuvsgul, 44/45 respondents to the technology survey watched television and 43/45 in Nalaikh. These statistics were comparable to the number of primary caregivers who had a mobile phone for personal use. In both districts, all but one of the television viewers were married and cared for between one to ten children.

The most popular television channels include: Mongolian National Broadcasting (MNB), UBS, 25TV, TV5, TV9, SBN, NTV and ETV. The most commonly watched television programs were: the news, Korean soap operas, films and music programmes. The least popular programmes included the talk shows 'Guest time' and 'Let's develop Mongolia' and television advertisements in general. Televisions were commonly turned on throughout the day in the background to ongoing activities, and specific viewing occurred mostly in the evening time. For 70% of respondents, viewing durations were during concentrated periods of between three and five hours. The summary table of television viewing is presented in Appendix 7.

Radio

74.2% of the survey respondents did not listen to the radio: only 10/45 respondents in Khuvsgul and 13/45 respondents in Nalaikh listened to the radio. Of those who did listen to radio, 39% tuned in daily, whilst 61% only listened once or twice per week. The most frequently listened to programmes were the news and weather forecasts. Radio listening was most common in the morning and afternoon, and 70% of respondents listened for under one hour. In general, participants did not connect listening to the radio with receiving health related information. The summary table of radio listening practices is presented in Appendix 7.

Internet

61.8% of survey respondents did not use the internet. In Khuvsgul only 14/45 respondents used the internet and 19/45 in Nalaikh. The majority of users went online daily, usually in the afternoon, primarily to check their Facebook page, chat online or search for information. All websites reviewed were in Mongolian script. Internet usage was concentrated into periods of 30 minutes to two hours duration.

One first-time mother interviewed in Murun confirmed that she used the Internet to look up health-related information during pregnancy. She had purchased a Skytel modem for 100,000 Tugrik (58.33 USD) and paid 10,000 Tugrik (5.83 USD) a month for unlimited internet service. Topics she researched while pregnant included breathing exercises, vaginal cleaning treatments, and skin conditions. She emphasised her frequent frustration at not being able to find the answers she required. The summary table of internet use is presented in Appendix 7.

Khotgoid mother and child, Murun General Hospital (Khuvsgul Province)

Conclusion and recommendations

The formative research undertaken with caregivers and health professionals in Khuvsgul Province and Nalaikh District documented new empirical data on preventable child deaths from pneumonia, diarrhoea and newborn complications in Mongolia. The research identified barriers that prevented communities from adopting healthy behaviours and best practices for timely and appropriate care seeking, and the positive motivations and triggers that contribute to an enabling environment and support communities to seek care.

The evidence generated through this research should be operationalised and used to inform programme design and communication strategies as UNICEF supports Mongolia in their pledge, 'A Promise Renewed', to focus on under-served populations and end preventable child deaths. Key findings will be used as a platform for an in-country workshop to develop C4D strategy in 2014. In conclusion, five interrelated areas of intervention are highlighted and associated recommendations made.

1) Core areas for communication interventions

Key communication for development objectives for Mongolia intend that mothers of under-fives and other influential decision makers will know the danger signs of pneumonia and be able to seek timely care and support from appropriate healthcare providers. In their recently published study, Baigalmaa et al. (2010) suggest that primary caregivers could not identify at least two symptoms of pneumonia. This result was not verified in this research. In contrast, the majority of mothers in both Khuvsgul and Nalaikh were able to identify symptoms of pneumonia, although their ability to identify key danger signs and knowledge about pneumonia prevention was more limited.

With regards to diarrhoea, most caregivers in both target areas were also able to recognise the onset of diarrhoea and its progressing severity, but understanding of prevention was lacking and their daily practices included few preventative measures.

Baigalmaa et al. (2010) suggested that mothers practised early or abrupt weaning because of their perception that babies who were breastfed for too long were difficult to wean. In contrast, this research indicated that caregivers' knowledge about exclusive breastfeeding was relatively high, yet mothers supplemented or withdrew breast milk when they were concerned about their low levels of milk production. A number of health professionals suggested that mothers gave their children reindeer milk to stop diarrhoea, but caregivers themselves disputed this, indicating that they gave children reindeer (or cow) milk to supplement breastfeeding. It is unknown whether mothers did have low milk production, or if this was a socially perpetuated fear. Further research could shed light on this issue.

If medical intervention is required then it should be encouraged in a timely and appropriate manner. Evidence on the uncontrolled use of drugs by caregivers, particularly with regard to antibiotics, suggests that communication interventions should be developed to address this practice. In addition, policy-level advocacy (discussed below) is needed to prevent substandard and counterfeit IMCI drugs from entering circulation.

Based on this research, the following are core areas that communication interventions should target:

- In relation to pneumonia, it is recommended that communication interventions focus on issues of prevention and early warning signs. Related issues such as household pollution through burning solid fuels and personal smoking habits should also be incorporated. Integrated with strategies to improve community understanding of the links between pollution and health, remedial action would also need to include alternative options at the household level as long term solutions.

- It is recommended that communication interventions for diarrhoea focus primarily on issues of prevention. This will necessitate strategies to include key WASH messages, particularly hand-washing with soap at critical times, improved sanitation, and household water treatment and storage (HWTS) methods. The potential to use cleaned leaded gasoline containers should be explored. In addition, communication should target the widely held belief that children's faeces are cleaner than those of adults and therefore warrant less hygienic means of disposal.
- Socio-cultural practices regarding breastfeeding should also be addressed in diarrhoea-related communication. The strategy should encourage exclusive breastfeeding and adequate maternal nutrition and should purposively address the concerns mothers articulated about low milk production, including practical guidance about how to breastfeed.
- Among Mongolia's Muslim Kazakh communities, who may be bathing their infants too frequently in respect of Islamic practices, emphasis needs to be placed on delayed bathing practices, particularly for pre-term or low-birth weight children.
- With regards to biomedical intervention, two key messages should be developed. First, that caregivers should not self-medicate but rather should access professional health services; and secondly, that caregivers should administer the correct dose of medication.

2) Opportunities for the adoption and promotion of appropriate healthy practices and actions

Several opportunities to enable caregivers, communities and healthcare personnel to adopt and/or promote appropriate healthy practices and actions were identified.

A key opportunity that was not being maximised was the promotion of health education when caregivers interacted with health facilities, during ANC and at other times. As discussed in detail, the majority of caregivers felt that health education and positive dialogue with health professionals was lacking. Although health professionals suggested that caregivers did not attend health education sessions due to lack of interest or laziness, other respondents confirmed that timings precluded their attendance due to household and work commitments. Several participants suggested that incentives could be used to encourage community engagement, but careful consideration must be given to issues of sustainability if these were to be introduced.

Maternity waiting homes were also seen to provide a good opportunity to both adopt and promote health practices and action, but again were being underused in this regard. A report by the Ministry of Health and UNICEF (2000) concluded that at no other time in their adult life did women have as much free time and space to learn and adopt new practices as in the period immediately before giving birth. One mother, comparing her normal routine to that in the maternity waiting home commented, '*Here it is nice. You cook your food and eat, and receive some treatments if necessary, and then you lie on the bed and rest. It's good*'.

More creative opportunities were also identified, particularly in relation to the harder to access nomadic groups who lived remotely. Reindeer families would routinely come to *soum* centres to collect their monthly government allowances, and caregivers would often collect their children from boarding school to spend the weekend with family. On both these occasions, but particularly the collection of monthly allowances, opportunities for interaction and engagement should be developed.

In terms of suitable communication channels, both health professionals and caregivers discussed both printed and visual media as useful information-sharing methods. No participant listed the radio as suitable for health education, but the majority stressed the use of television, giving positive examples of health education programmes. Television usage data from the technology survey indicated that even the most rural families watched television, so it would be reasonable to expect good coverage and a high rate of return on investment to broadcast health information on television, although in a non-advertisement

format. Monitoring mechanisms should be established to determine the impact of such communication strategies on health behaviour over time.

The following key opportunities were identified to enable caregivers, communities and healthcare personnel to adopt and/or promote appropriate healthy practices and actions:

- Improving the quality and quantity of health education at health facilities should be immediately actioned. Associated IEC and BSCC materials should be developed and implemented in the target areas, and, most importantly, health professionals should receive training in communication and counselling skills. Similarly, *bagh feldshers* should receive additional training to facilitate communication activities at both a household and community level during their outreach sessions. These sessions should incorporate caregivers (mothers, fathers, grandmothers etc.) and the wider community and should be promoted as interactive, fun and engaging events.
- The timing of health education and communication sessions should be carefully tailored to the daily routine of the target audience. The lifestyle of the population is heavily seasonal, with the winter months being an obvious period to invest in additional communication activities.
- Accessing mothers and providing health education at maternity waiting homes should be a key component of any communication strategy.
- Several mothers recounted sharing information with other mothers, and discussing health issues as a collective. Informal discourse and experience sharing should be facilitated in both a community and hospital setting and at maternity waiting homes.
- Opportunities for interaction and engagement should be facilitated in relation to community activities, such as the monthly collection of allowances by Reindeer families, or parents coming to *soum* centres to visit their children. Sessions could be used constructively to promote healthy practices and actions, but also to gather information about the group and the health status of the community.
- Caregivers stressed that both print and visual media should complement and supplement face-to-face dialogue with health professionals.
- A final opportunity that must be highlighted is harnessing local healers. Healers have high levels of access to and social agency with communities and are important figures in local pathways of care. They should be empowered to both adopt and promote healthy behaviour and to refer patients in a timely and appropriate manner when necessary.

3) The feasibility for introducing mHealth and other technologies

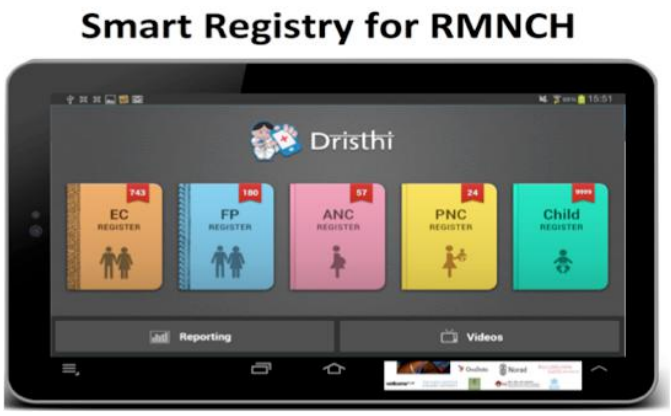
The social media landscapes of both Khuvsgul and Nalaikh were mapped in detail. Findings indicated that it should be feasible to introduce mHealth in Mongolia. A high percentage of caregivers had mobile phones that they used for calls and also text messages. Phone credit was widely available in both urban and *soum* centres and service providers indicated that women were the majority of the customer base purchasing mobile credit for themselves and their families.

Network coverage for cellular services was high in both urban and *soum* centres, although reception was severely reduced in more rural areas. Contacting people living in Taiga or those travelling with their families and herds outside of soum areas was not possible via mobile phone. The Mongolian phone company G mobile has developed a long range 'home' phone which is capable of making and receiving calls even in remote areas due to its portable antenna. However, this device cannot make nor receive text messages, and therefore has limited technological capabilities in terms of SMS-based mHealth.

It is difficult to assess how receptive people would initially be with regards to adopting a new and potentially disruptive technology and, in the abstract, it was challenging to determine the level of demand from caregivers or health professionals. With this caveat in mind, three points should be highlighted. First,

given the request by mothers that clinic appointments are made in advance, mHealth has obvious benefits and would likely be well received by participants. Secondly, the level of mistrust some caregivers described for the professional competency and integrity of health staff would need to be carefully managed and it would be important that all SMS messages be perceived as originating from a trusted source. If not, health advice may not be followed and could be detrimental to routine health practices. Thirdly, advances in SMS messaging should not negate the previously identified need for increased interpersonal communication between doctor and patient. Increasing the responsiveness of doctors to patients' needs during hospital/clinic consultations will only increase the value of SMS-based messages when face-to-face consultations are not possible due to distance.

In relation to the use of mHealth and other technologies by health personnel, it may be useful to consider the use of low cost tablet computers for *bagh feldshers*. There have been several promising health technology initiatives that have engaged community health workers by providing them with low-cost mobile devices to show instructional videos and other visual media to primary caregivers.



Some of the most promising mHealth applications that support community health workers not only deliver timely health education information, but also provide the capability to collate, track and monitor all routine RMNCH heath data, typically collected by 'mobile doctors'. Dristhi, the Smart Registry application system, has the potential to assist *bagh feldshers* and other community health workers with compiling current registers, collecting data and the timely reporting of health events. This technology, currently being developed by WHO (among others), offers a promising mHealth platform for maternal and child health. Dristhi eliminates paper-based records and works offline to link health information (that is both relevant and timely) and provide better reporting and monitoring of clients. Each of these factors represent particularly useful advancements for community-based interventions.

CommCareHQ is another positive mHealth option that could potentially increase the capacity of *bagh feldshers* in their outreach activities. This technology utilizes SMS for data collection with Java enabled mobile phones (ideal for areas with limited wireless or 3G access), and automated text or voice message alerts reminding caregivers of appointments or providing timely health information triggered by upcoming events (such as pregnancy due dates). CommCareHW serves as a job aid for a mobile workforce and captures large amounts of data for storage in an electronic repository, which again eliminates the need for cumbersome paper-based records.

In terms of the feasibility of introducing mHealth, a side of the equation not explored during the research was the technical capacity of the health system to support appropriate mHealth interventions. This would necessitate close collaboration with the telecom providers, at least initially, and for any intervention to be successful, appropriate resources and time must be allocated for design, implementation and ongoing monitoring and evaluation.

Given that many caregivers described having more than one phone in order to access preferable call and text rates, it would be critical to agree with service providers on a basic or standard option package to support mHealth. Beyond collaboration with corporates, it would also be vital to actively engage with government IT departments to gain further understanding of any current or potential eHealth and mHealth strategies employed. Equally important is the use of unique identification (ID) and health data standards (ie. computer protocols that allow health information to be extracted from one system and transported to another) to enable interoperability between systems. Unique IDs (such as National IDs) are important in tracking the same person across multiple health departments and/or other government services. In the

context of Mongolia, this would be particularly important for tracking migrant populations in order to streamline healthcare services regardless of the district caregivers reside in and/or are registered.

4) Engagement of the private sector

Three potential partners from the private sector were identified to enhance child survival activities at both national and local levels. Firstly, the dominant phone companies Unitel and Mobicom. They were the largest mobile service providers in Mongolia, the most well established and boasted the widest coverage. As partners, they could also provide valuable promotional opportunities raising awareness of key health messages through positive marketing. Their partnership would also be required for the effective roll-out of any mHealth intervention. In the past, mHealth initiatives have also had success in engaging smaller and less-well known companies, as businesses that are invested in expanding their profiles may have more of a stake in helping to achieve mHealth goals and reaching a wider audience base (Mechael 2009). For that reason, Skytel and G mobile should also be seen as potential partners as they strive to increase their market share.

Aside from exploring partnerships with telcos to provide mHealth support (eg. SMS data services), it may also be valuable to engage with them to share call detail records (CDR) of subscribers in the target areas (although there may be potential date protection and other regulatory issues to consider). This would facilitate a better understanding of mobility patterns (useful for modelling the spread of disease or disaster affected populations), social interaction (the identification of geographical distribution of social connections in order to develop demographic profiles by age and sex to identify behavioural patterns) and economic activities (estimating average household incomes of anonymous subscribers). CDRs are automatically generated by mobile network carriers and capture telecom details such as latitude, longitude, duration of call, number originating the call, number called and name (encrypted for privacy).

In terms of partnering with a national media organisation, the National Broadcasting Channel was specifically mentioned as the best placement for health programming by multiple caregivers. In order to reach the largest number of primary caregivers, health programming should be routinely aired at a set time and date so that planned (rather than opportunistic) viewing can be arranged. Respondents to the technology survey indicated families were mostly likely to watch television together in the evening, and suggested that this would be the best time for general health orientated screenings, thereby benefitting fathers, grandmothers and other close relatives in addition to the primary caregiver. A number of mothers suggested during interview that they have the television on during the day in the background, but would be likely to watch a specific health programme related to their needs whilst they completed certain household chores. Given this, it would be important to develop a medium- to long-term plan with a broadcaster to strategise on when to air target messages.

The third potential partnership identified was with private pharmacists. As discussed in relation to Nalaikh, pharmacists were trusted sources of health information and often frontline providers of medicines, both prescribed and over-the-counter. They benefitted from an established network and coverage that afforded them reach at the community level. Engaging with pharmacists would provide a unique opportunity to enhance a multitude of child survival activities.

5) Key advocacy issues

Using the UNICEF questionnaire (see Appendix 5) as a base, representatives from the Ministry of Health, National Centre for Maternal and Child Health, and National Centre for Communicable Diseases were asked to provide their views on key advocacy issues through which to elevate the priority of and resources for reducing childhood morbidity and mortality due to pneumonia, diarrhoeal disease and newborn complications. Their responses were clustered around five main themes.

Policy and strategy: Policies should be evidence-based and resulting strategies clearly communicated to the public to ensure their necessary engagement. Overall, child health was not a government priority as reflected in the low level of direct funding, and raising the awareness of child health initiatives would mainstream their importance in political discussion (see below). Cross-sector policies should also be developed, for example, environmental policies that have an impact on health and wellbeing should be more prominent.

Planning, management and coordination: Collaboration and effective communication were not always evident. Integrated programming was called for with improved coordination between sectors. Results-based planning and ongoing project management were seen to be essential if outcomes were to have leverage and create sustained momentum.

Human resources: It was emphasised that Mongolia's human resources for health are struggling to support an over-burdened health system, partly because graduates are reluctant to work in rural provinces. Stakeholders recommended that the quality of education provided by the Health Sciences University and other medical colleges needed to improve, with increased opportunity for practical as well as theoretical training. At the time of the research there were five medical colleges in Mongolia, described by stakeholders as being of poor quality and in need of greater oversight. Health specialists were urgently required, and midwives were regarded as a cadre in need of particular strengthening and support as they were responsible for all births at *soum* hospitals. The possibility of introducing more attractive incentives was raised, but again issues of sustainability were cautioned. It was clear to the research team, however, that developing human resources for health and health workforce planning and distribution should be priority areas. Health workers require continual professional development, refresher training and on-the-job supervision, components that appear lacking in Mongolia.

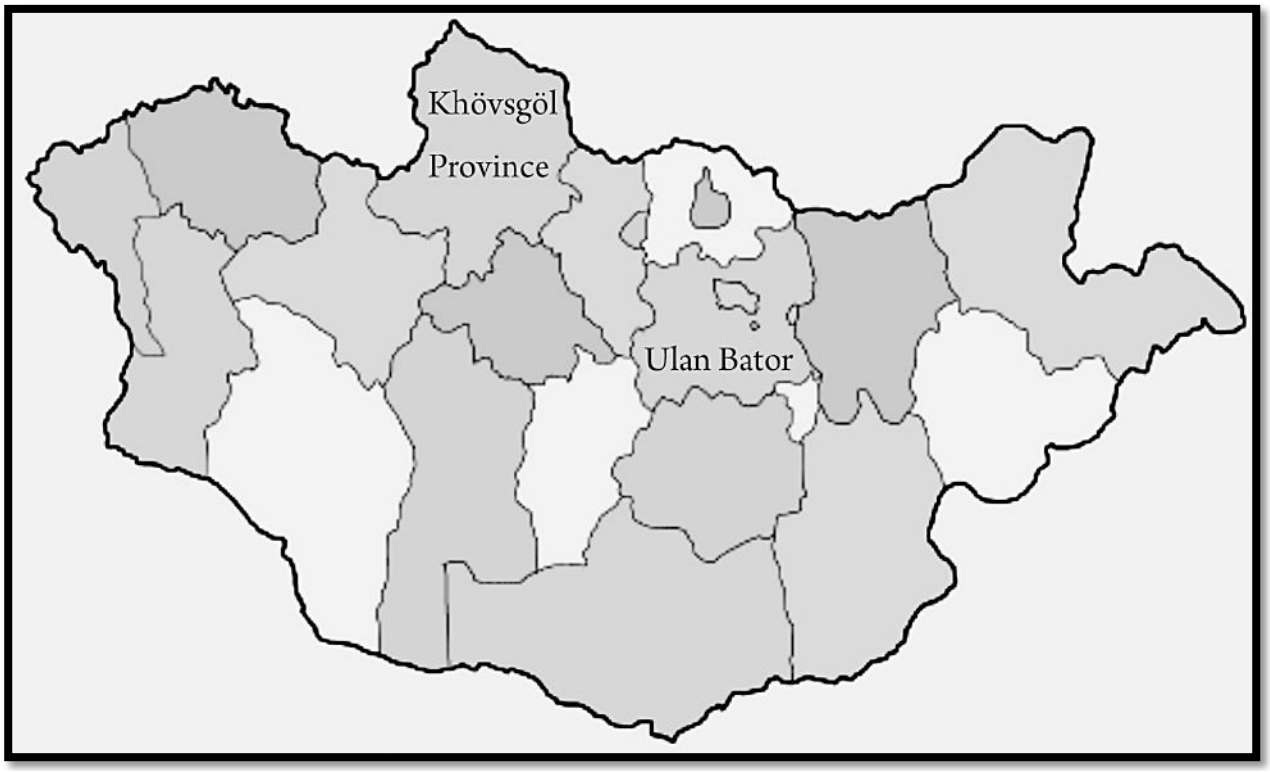
Supply chain management: UNICEF and WHO are already focusing on supply chain management, but representatives stressed that ongoing assistance is needed. The Ministry of Health does not have its own drug storage facility, even for emergency drug stockpiling, and depends on private companies for drug distribution. Governmental budgets for healthcare should be needs-based in order to meet demand, particularly for essential drugs including ORS, zinc and antibiotics, and cold chain management needs to be improved.

Political advocacy: Representatives urged advocacy to be targeted at politicians and policymakers more broadly, to secure increased political support for preventable child deaths. It was felt that political leaders lacked a good grasp of key issues and that they interpreted health issues in isolation, seeing them as being the remit of the health sector alone. It was suggested that key actors be taken to *soum* hospitals to meet with rural doctors and *bagh feldshers*, particularly during seasonal epidemics and times of high workloads. Individual advocates could then champion the need for increased resources to tackle child death.

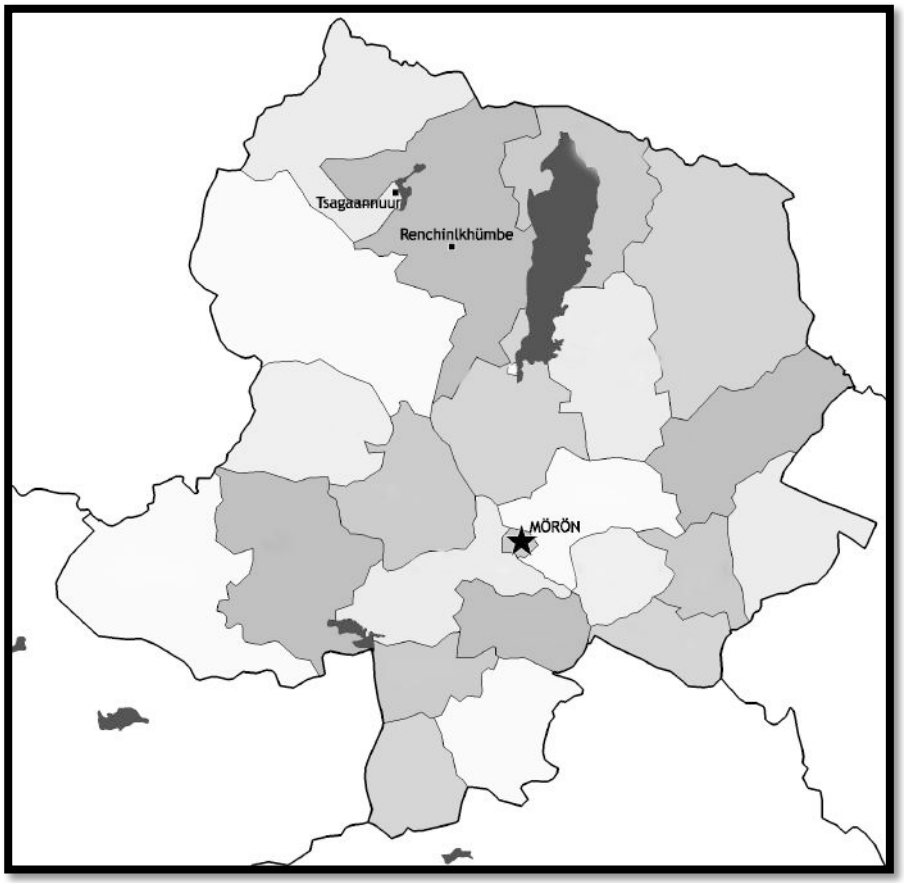
Although not discussed during the stakeholders workshop, three additional issues for targeted political advocacy were raised by UNICEF staff during the research: drug procurement, registration of migrants (and students), and a nationwide ban on the use of leaded gasoline. The first two issues have been discussed in detail above. In relation to leaded gasoline, Mongolia is one of only 17 countries in the world where its sale is legalised, yet UNICEF studies have demonstrated the detrimental effects of leaded gasoline and solid fuels in relation to upper respiratory health (UNICEF 2012b). Mongolia's leaders should be supported to effect a ban on the use of leaded gasoline in recognition of its risk to health.

Child under five years of age, Ulaan-Uul *soum* (Khuvsgul Province)

Appendix 1 – Maps of field sites



Mongolia



Khuvsgul Province

Appendix 2 – Schedule of fieldwork

Date	Activity
29 September	Arrive in Mongolia
30 September	Briefing with MoH/UNICEF-Mongolia
1 October	Fly to Khuvsgul Fieldwork Day 1 Khuvsgul (Murun)
2 October	Drive to Tsagaannuur Fieldwork Day 2 Khuvsgul (Tsagaannuur)
3 October	Fieldwork Day 3 Khuvsgul (Tsagaannuur)
4 October	Drive to Renchinlkhümbe / Fieldwork Day 4 Khuvsgul (Renchinlkhümbe) Drive to Murun
5 October	Fieldwork Day 5 Khuvsgul (Murun)
6 October	Fieldwork Day 6 Khuvsgul (Murun) Fly to Ulaanbaatar
7 October	Drive to Nalaikh / Fieldwork Day 1 Nalaikh Drive to Ulaanbaatar
8 October	Drive to Nalaikh / Fieldwork Day 2 Nalaikh Drive to Ulaanbaatar
9 October	Drive to Nalaikh / Fieldwork Day 3 Nalaikh Drive to Ulaanbaatar
10 October	Preparation for de-briefing
11 October	Roundtable workshop with MoH & UNICEF
12 October	Depart Mongolia

Appendix 3 – Research tools

Selection of research tools.

Topic guide

Pneumonia, diarrhoea and newborn complications (P, D and NC)
Language used to describe illness/newborn complications
Local theories of causation
Recognition of illness
Preventative measures/prevention strategies
Perception of risk/danger

Care and treatment-seeking behaviour for P, D and NC (including timing and frequency)
Response to illness/newborn complications
Previous experiences (case study)
Treatment strategies/treatment sought (including gender; eg. role of husband)

Modes of healthcare (including perception of service quality)
Biomedical/local/traditional
Relations with healthcare providers (historical, contemporary)
Non-medical impact of seeking different modes of healthcare

Location of healthcare
Distance
Time/Season
Terrain/Traffic
Transport/Access

Household and community
Socio-cultural norms (encourage, discourage behaviour)
Household (priorities and negotiation)
Social relationships, decision-making continuum and agency to act (including gender)
Role of religious and spiritual beliefs, and local custom

Financial
Costs (direct and indirect, eg. time poverty)

Level of (biomedical) knowledge
Health education exposure
Information about services available (demand side)

Local solutions

Behaviour and change
Divergence between theory and practice (eg. know what should do, but doesn't – why?)
Triggers and processes of change in health beliefs and practices (eg. positive deviants identified?)

Technology
Access to mobile phone (including gender)

Interview framework

Primary caregivers with newborns and/or child(ren) under five years experiencing or having recently experienced pneumonia, diarrhoea and/or newborn complications

- Age
- Relationship to child
- Marital status
- Number of children in care
- Age of children
- Gender of children

Do children go to school
Did carer go to school
Does family (paternal, maternal) live near
Religion
Employment
General income range

Q1

What are the main child health problems in your community? Pregnancy and birth related problems?
Do many young children (under 5) die in this area? Delivering mothers and newborns?
What do they die from?

Q2

What do you call pneumonia in your community? What does pneumonia do?
What causes pneumonia and what are the symptoms? Short or long duration?
How do you prevent pneumonia and do you do this?

What do you call diarrhoea in your community? What does diarrhoea do?
What causes diarrhoea and what are the symptoms? Short or long duration?
How do you prevent diarrhoea and do you do this?
Where does your family get water from? Do you drink it directly from the source?
Where does your family (adults and children) go to the toilet? (If in the bush, do you leave it?)
Is it more appropriate to leave child faeces in the open or discard? Why?
Does your family wash their hands? With water only? With soap? When (before dinner, after toilet)?

What are common complications that can result from birth?
What causes complications and what are the symptoms/danger signs?
How do you prevent complications and do you do this?

Why do you think your child's pneumonia/diarrhoea/birth complications started when it did?

Q3

For child illness, do you use traditional medicine/home remedies?
What for? How do you prepare? Where do you get the herbs? Who showed you how to use them?
What are the hoped for results from this treatment?
Does your family use a traditional doctor/spiritual healer for child illness?
What are the hoped for results from this treatment? Do you have to pay? How much?
For birth assistance, do you use traditional birth attendants/midwives/relatives?
What are the hoped for results from this treatment? Do you have to pay? How much? How do you contact when close to delivery? Where does delivery take place? Does anyone else assist?

Do you sometimes go to the health centre for child illness? Antenatal (pregnancy) care/birth assistance?
What are the hoped for results from this treatment?
How far is the health centre from your place? How do you get there?
What cost is incurred to visit the health centre and obtain medicine/care?
What is your opinion about the quality of the services provided by health centre? Do you have to wait?
Do you sometimes use the chemist for child illness? Pregnancy or birth related medicine?
Why do you use the chemist (instead of the health centre?)
How far is the chemist from your place? How do you get there?
What cost is incurred to visit the chemist and obtain medicine?

Q4
When a child is ill, who do you tell? If you are experiencing pregnancy complications, who do you tell?
In the past (1, 3, 6 months) did you talk to anyone about child's illness/birth? With whom?
What kind of help does your husband / family provide to you when a child is ill? What kind of help does your husband / family provide to you when you are preparing for birth?
Who makes the decision to treat the child? Seek birth assistance?
Do you feel capable of taking care of your child when ill/yourself when pregnant and preparing for birth?

Q5
What cultural beliefs influence child illness/birth and treatment seeking in your community?

Q6
How often is your child ill? How often have you experienced complications related to birth?
How often do you get treatment for your child? Seek assistance for pregnancy complications/birth?
When did you last visit the health centre because of child illness? For birth assistance? (Elicit narrative)

Q7
Of the two child illnesses and birth complications, which is the most dangerous for children in your opinion?
What do you fear most about this illness/complication?
Of the two child illnesses and birth complications, which are you most likely to visit a health centre for?

Q8
Where do you get your information about child illness/birth preparedness?
What child survival information, education and communication activities are targeted at mothers?
What measures should be taken to improve the community's knowledge about child illness/birth preparedness?

Q9
What are the main challenges your family faces in going to the health centre or accessing treatment for child illness? Accessing antenatal care or birth assistance?
What are the reasons that some families do not take their child for treatment if they are ill? Pregnant women do not visit healthcare facility for antenatal care and birth assistance?
Does the cost of accessing treatment sometimes prevent you taking the child/yourself?
Does lack of time in daily routine for accessing treatment sometimes prevent you taking the child/yourself?

Q10
What are the solutions to these challenges / barriers?
What can be done to improve the health of children/mothers in this area?

Q12
Do you have a mobile phone for your personal use?
Does any member of your family have a mobile phone? Who is most often in possession of the phone?
Have you ever made/received a health related phone call or text?

Focus group framework

Mothers / fathers with newborns and/or child(ren) under five years experiencing or having recently experienced pneumonia, diarrhoea and/or newborn complications

Q1

What are the main child health problems in your community? Pregnancy and birth related problems?
Do many young children (under 5) die in this area? Delivering mothers and newborns?
What do they die from?

Q2

What causes pneumonia what are the symptoms? What does pneumonia do?
How do you prevent pneumonia and do you do this?

What causes diarrhoea and what are the symptoms? What does diarrhoea do?
How do you prevent diarrhoea and do you do this?

What causes birth complications and what are the symptoms/danger signs? What does this do?
How do you prevent birth complications and do you do this?

Q3

For child illness, do you/your wife use traditional medicine / home remedies? What are the hoped for results from this treatment?
Does your family use a traditional doctor / spiritual healer for child illness? What are the hoped for results from this treatment?

For birth assistance, do you/your wife use traditional birth attendants/ midwives/ relatives? What are the hoped for results from this treatment?

Do you/ your family sometimes go to the health centre for child illness? Antenatal (pregnancy) care/ birth assistance? What are the hoped for results from this treatment?
How far is the health centre from your place?
What is your opinion about the quality of the services provided by the health centre?

Do you sometimes use the chemist for child illness? Pregnancy or birth related medicine?
Why would you use the chemist (instead of the health centre?)

Q4

What kind of help does your family provide/do you provide your wife when a child is ill? During pregnancy and birth?

Q5

What cultural beliefs influence child illness/birth and treatment seeking in your community?

Q6

What role should mothers/fathers play to prevent children getting pneumonia, diarrhoea and experiencing newborn complications?

What role should mothers/fathers play to ensure children and delivering mothers access treatment quickly and easily?
What role should mothers/fathers play to create awareness about childhood illness/birth preparedness?
Who makes the decision to seek treatment for child illness? Birth assistance?
Do you feel you are/your wife is capable of taking care of child when ill? Of yourself/herself during pregnancy and birth?

Where do you get information about child illness/birth preparedness?
Are there any child survival information, education and communication activities targeted at mothers/fathers?
What measures should be taken to improve mothers'/fathers' knowledge about child illness/birth preparedness?

Q7
What are the main challenges your family faces in going to the health centre or accessing treatment for child illness? Accessing antenatal care and birth assistance?
What are the reasons that some families not take their child for treatment if they are ill? Pregnant mother for antenatal care and birth assistance?
Does the cost of accessing treatment sometimes prevent taking the child/mother?
Does lack of time in daily routine for accessing treatment sometimes prevent taking the child/mother?

Q8
What are the solutions to these challenges / barriers?
What can be done to improve the health of children and mothers in this area?

Q10
Do you have a mobile phone for your personal use?
Does any member of your family have a mobile phone? Who is most often in possession of the phone?

Focus group framework

Health professionals treating newborns and/or children under five years of age experiencing or having recently experienced pneumonia, diarrhoea and/or newborn complications

Q1

What are the main child health problems in your community? Pregnancy and birth related problems?
Do many young children (under 5) die in this area? Delivering mothers and newborns?
What do they die from?

Q2

What causes pneumonia what are the symptoms? What does pneumonia do?
How do you prevent pneumonia and do you do this?

What causes diarrhoea and what are the symptoms? What does diarrhoea do?
How do you prevent diarrhoea and do you do this?

What causes birth complications and what are the symptoms/danger signs? What does this do?
How do you prevent birth complications and do you do this?

Q3

Regarding delivery, what specific activities should health care workers do for the mother and newborn immediately after birth? Is there a specific order for these activities to be performed? Why?
When should the newborn be dried? Contact with mother initiated?
When should the cord be clamped and cut? How?
Should breastfeeding be initiated with a newborn? When?
What are some barriers that may prevent adopting these newborn practices?

Q4

For child illness, do some families use traditional medicine / home remedies? What are the hoped for results from this treatment?
Do some families use a traditional doctor / spiritual healer for child illness? What are the hoped for results from this treatment?

For birth assistance, do some families use traditional birth attendants/ midwives/ relatives? What are the hoped for results from this treatment?

Do some families go to the health centre for child illness? Antenatal (pregnancy) care/ birth assistance?
What are the hoped for results from this treatment?
What is your opinion about the quality of the services provided by the health centre?

Do some families use the chemist for child illness? Pregnancy or birth related medicine?
Why do they use the chemist (instead of the health centre?)

Q5

What kind of help do husbands / family provide to mothers when a child is ill? During pregnancy and birth?

Q6

What cultural beliefs influence child illness/birth and treatment seeking in this community?

Q7

Where do the community learn about child illness? Antenatal care and birth preparedness?
What child survival information, education and communication activities are targeted at mothers/fathers?
What measures should be taken to improve the community's knowledge about child illness? Antenatal care and birth preparedness?

Q8
What activities do health workers undertake in the community?
What challenges do health workers face doing their work in the community?
Do you get support from the health centre, the government, the community?
Do you feel capable of taking care of ill children/pregnant mothers given the current available resources?

Q9
What are the main challenges families in this community face in going to the health centre or accessing treatment for child illness? Accessing antenatal care or birth assistance?
What are the reasons that some families not take their child for treatment if they are ill? Pregnant mother for antenatal care or birth assistance?
Does the cost of accessing treatment sometimes prevent families from taking the child/mother?
Does lack of time in daily routine for accessing treatment sometimes prevent taking the child/mother?

Q10
What are the solutions to these challenges / barriers?
What can be done to improve the health of children and mothers in this area?

Q12
Do you have a mobile phone for your personal use?
Do you use this phone to communicate with families? With health care facility?

Technology survey
Primary caregivers of children under five years

Date:	Name of Interviewer:	Location & Group: Khuvsgul or Nalaikh/Ethnicity

- Age
- Relationship to child
- Marital status
- Number of children in care
- Age of children
- Gender of children

Do children go to school
Did carer go to school
Does family (paternal, maternal) live near
Religion
Employment
General income range

Other technology
1a. Do you listen to the radio?
b. How often? [Not at all, Less than once a week, Once a week, Every day]
c. What radio station(s) do you listen to most often?
d. What type of radio program do you like the most?
e. What types of radio program do you like the least?
f. When do you usually listen to the radio (Day, Time)?
g. On average, how many hours per day do you listen to the radio?

2a. Do you watch television?
b. How often? [Not at all, Less than once a week, Once a week, Every day]
c. What television channel(s) do you watch most often?
d. What type of TV program do you like the most?
e. What type of TV program do you like the least?
f. When do you usually watch TV (Day, Time)?
g. On average, how many hours per day do you watch television?

3a. Do you use a computer with Internet access?
b. How often? [Not at all, Less than once a week, Once a week, Every day]
c. For what purpose do you use the Internet?
d. When do you usually use the Internet (Day, Time)?
e. On average, how many hours per day do you use the Internet?

Mobile technology
4a. Do you have a mobile phone for your personal use? [If no, skip to Question 9]
b. How often is this phone charged/functional? [Not at all, Less than once a week, Once a week, Every day]
c. Does the phone currently have credit and able to make a call?

5a. Is this phone capable of sending and receiving phone calls?
b. Do you make or receive calls?
c. Who do you frequently call or receive calls from?

6a. Is this phone capable of sending and receiving text messages?
b. Can you read text messages from the phone?
c. Do you make or receive text messages?
d. Who do you frequently text or receive texts from?

7a. How is the network reception in your area? [No reception, Not very good, Good]
b. Can you make or receive a phone call using this phone from inside your home?

c. Is there another location where cell reception is good/better than within your home? Where?

8. What phone company provides service for this phone?

9. Could you list the persons who you are closest to who have a mobile phone and tell me how you are related to them [husband, mother-in-law, friend, etc.]? If your phone was out of order, under what circumstance would you go to these persons to borrow their phone?

Name*	**Relationship**	**Borrow phone?**
a_____	_____	**f** Never Emergency Occasionally Anytime
b_____	_____	**g** Never Emergency Occasionally Anytime
c_____	_____	**h** Never Emergency Occasionally Anytime
d_____	_____	**i** Never Emergency Occasionally Anytime
e_____	_____	**j** Never Emergency Occasionally Anytime

10. Please describe the relationship ties between persons listed above. Note: The grid will only be filled completely if interviewee listed 5 names. [**VC** = very close; **C** = close; **S** = strangers]

	Relationship 9b	Relationship 9c	Relationship 9d	Relationship 9e
Relationship 9a				
Relationship 9b				
Relationship 9c				
Relationship 9d				

*Only record initials or first name. Names will not be used in data analysis or the final report.

Appendix 4 – Consent forms

English language version

UNICEF / Anthrologica

Formative research on reducing preventable child deaths from pneumonia, diarrhoea, and newborn complications in Mongolia and Timor Leste

Background to the study

Pneumonia and newborn complications are the leading causes of child death in Mongolia, whilst diarrhoea, pneumonia and newborn conditions cause the highest number of child deaths in Timor Leste. UNICEF is supporting the countries to develop integrated programming strategies to focus on the three priority issues in an interrelated fashion. UNICEF has therefore commissioned Anthrologica to conduct formative research to inform programme design and communication for development strategies on reducing preventable child deaths from pneumonia, diarrhoea and newborn complications in Mongolia and Timor Leste.

Objective of the study

The objective of this study is to learn from care givers in Mongolia and Timor Leste. We are interested in:

- Your perceptions and experiences of pneumonia, diarrhoea and newborn complications
- Your treatment-seeking behaviour for pneumonia, diarrhoea and newborn complications
- The barriers, difficulties and challenges you face in accessing treatment for these illnesses
- Your ideas about solutions to these challenges, ways in which the barriers can be overcome, and what would need to happen for better and more timely access to treatment for these illnesses.

Interview/Focus Groups

For this purpose, we would like to talk to you about matters relating to pneumonia, diarrhoea, and newborn complications in children. The informal interview/focus groups will last for approximately one hour. You have the right to withdraw from the discussion at any time without reason.

We will ensure that your information, opinions and experiences are kept confidential and will only be used for the purpose of the study outlined. We will not use your name. You may ask any questions related to the study and we will answer these questions to your satisfaction.

During our discussion we will make an audio recording for our records. This will be destroyed at the end of the study. We may also take a number of photographs of you. These will be used for the purpose of the current study and may be included in academic publications and other material for UNICEF and Anthrologica. If your photograph is published, you shall not be identified by name and the usual confidential process shall be followed.

In regard to collecting information for this study we would greatly appreciate your help and therefore seek your consent and cooperation.

INFORMED CONSENT

I have been informed in detail about the purpose and nature of this study.
I have received satisfactory answers to all my questions relating to this study.
I have decided that I will participate willingly and can withdraw at any time for any reason.
I give my informed consent to participate in this study and have my photograph taken as part of the study.

_____	_____	_____
Name of Participant	**Signature**	**Date**
_____	_____	_____
Name of Witness	**Signature**	**Date**

As a witness of this letter, I ensure that I have the above information has been accurately conveyed to the participant. I also ensure that they have decided to participate in this study freely and willingly.

Mongolian language version

НҮБХС/ Антрологика

Монгол Улс ба Тимор Леште Улсад уушигны хатгалгаа, суулгалт ба нярайн хүндрэлээс шалтгаалсан урьдчилан сэргийлэх боломжтой эндэгдлийг бууруулах тухай форматив судалгаа

Ерөнхий мэдээлэл

Уушигны хатгалгаа ба нярайн хүндрэл нь Монгол улсад хүүхдийн эндэгдлийн тэргүүлэх шалтгаан болоод байгаа бол Тимор Леште Улсад суулгалт, уушигны хатгалгаа ба нярайн үеийн асуудлууд хүүхдийн эндэгдлийн гол шалтгаан болж байна. НҮБХС улс орнуудад тэргүүлэх гурван чиглэлийн асуудлыг хоорондоо уялдаатай байдлаар анхаарах нэгдсэн хөтөлбөрийн стратегиудыг боловсруулах чиглэлээр дэмжлэг үзүүлж байгаа. Иймээс НҮБХС нь Антрологика-д Монгол Улсад ба Тимор Леште Улсад хүүхдийн урьдчилан сэргийлэх боломжтой эндэгдлийн шалтгаан болсон уушигны хатгалгаа, суулгалт, нярайн хүндрэлийг бууруулахад чиглэсэн хөтөлбөрийн дизайн, харилцааны стратеги боловсруулахад ашиглах мэдээллийг олгох форматив судалгаа хийх захиалгыг өгсөн болно.

Судалгааны зорилт

Энэхүү судалгааны зорилт нь Монгол Улсад ба Тимор Леште Улсад хүүхдийг асран халамжлагч нараас суралцахад оршино. Бидний сонирхож байгаа зүйлс:

- Уушигны хатгалгаа, суулгат, нярайн хүндрэлийн талаар таны ойлголт, туршлага
- Уушигны хатгалгаа, суулгалт, нярайн хүндрэлийн үеэр ямар тусламж, үйлчилгээ авахыг хичээдэг вэ
- Эдгээр өвчний эмчилгээ авахад ямар саад бэрхшээл, хүндрэл танд тулгардаг вэ
- Эдгээр асуудлыг шийдвэрлэхийн тулд таны бодлоор яасан нь дээр вэ, яаж даван туулах вэ, эдгээр өвчний эмчилгээг сайжруулах, цаг тухайд нь авах боломжийг бүрдүүлэхийн тулд яавал зохистой вэ.

Ярилцлага/Бүлгийн ярилцлага

Дээрх зорилгын хүрээнд бид тантай хүүхдийн уушигны хатгалгаа, суулгалт, нярайн хүндрэлийн талаар ярилцах гэсэн юм. Албан бус ярилцага/бүлгийн ярилцлага нэг цаг орчим үргэлжилнэ. Та ямар ч шалтгаан дурдахгүйгээр дуртай үедээ энэ ярилцлагыг орхиод явах эрхтэй.

Таны мэдээлэл, санал бодол, туршлагын нууцыг хадгалах бөгөөд зөвхөн дээр дурдсан судалгааны зорилгоор ашиглана гэдгийг бид батлан дааж байна. Таны нэрийг ашиглахгүй. Судалгаатай холбоотой ямар ч асуулт та тавьж болно. Бид таны сэтгэлийг ханатал тэдгээр асуултад хариулна.

Бидний ярилцлагын үеэр баримтжуулах зорилгоор бид аудио бичлэг хийж магадгүй. Үүнийг судалгааны эцэст устгана. Таны зургийг авч магадгүй. Эдгээрийг өнөөгийн судалгааны зорилгоор ашиглах ба НҮБХС, Антрологика-гийн эрдэм шинжилгээний нийтлэл ба бусад материалд оруулж магадгүй. Хэрэв таны зургийг нийтлэхээр бол таны нэрийг бичихгүй, нууцыг хадгалах дүрмийг баримтална.

Энэхүү судалгааны мэдээллийг цуглуулахад үзүүлж байгаа таны тусламжид гүнээ талархаж, таны зөвшөөрөл, хамтын ажиллагааг хүсэж байна.

ТАНИУЛСАН ЗӨВШӨӨРӨЛ

Энэхүү судалгааны зорилго, мөн чанарын талаар би дэлгэрэнгүй мэдээлэл авсан.
Энэхүү судалгаатай холбоотой бүх асуултад сэтгэл ханамжтай хариу авсан.
Би өөрийн сонголтоор оролцохоор шийдвэрлэсэн бөгөөд ямар ч шалтгаанаар хэзээ ч гарч болно.
Энэхүү судалгаанд оролцох, зургаа татуулах танисан зөвшөөрлийг олгож байна.

_____	_____	_____
Оролцогчийн нэр	**Гарын үсэг**	**Огноо**
_____	_____	_____
Гэрчийн нэр	**Гарын үсэг**	**Огноо**

Энэхүү хуудсанд гэрчилсэн би дээрх мэдээлэл үнэн зөвөөр оролцогчид хүрсэн гэдгийг баталж байна. Тэд судалгаанд өөрсдийн сонголтоор эрх чөлөөтэй оролцохоор шийдсэнийг баталж байна.

Appendix 5 – UNICEF questionnaire

A) Review the list of key Pneumonia and Diarrhoea prevention and control and newborn care interventions and decide if the interventions are included in the child and child health related strategies or policies or strategic plans by putting a tick in the corresponding space and write the name of the specific document.

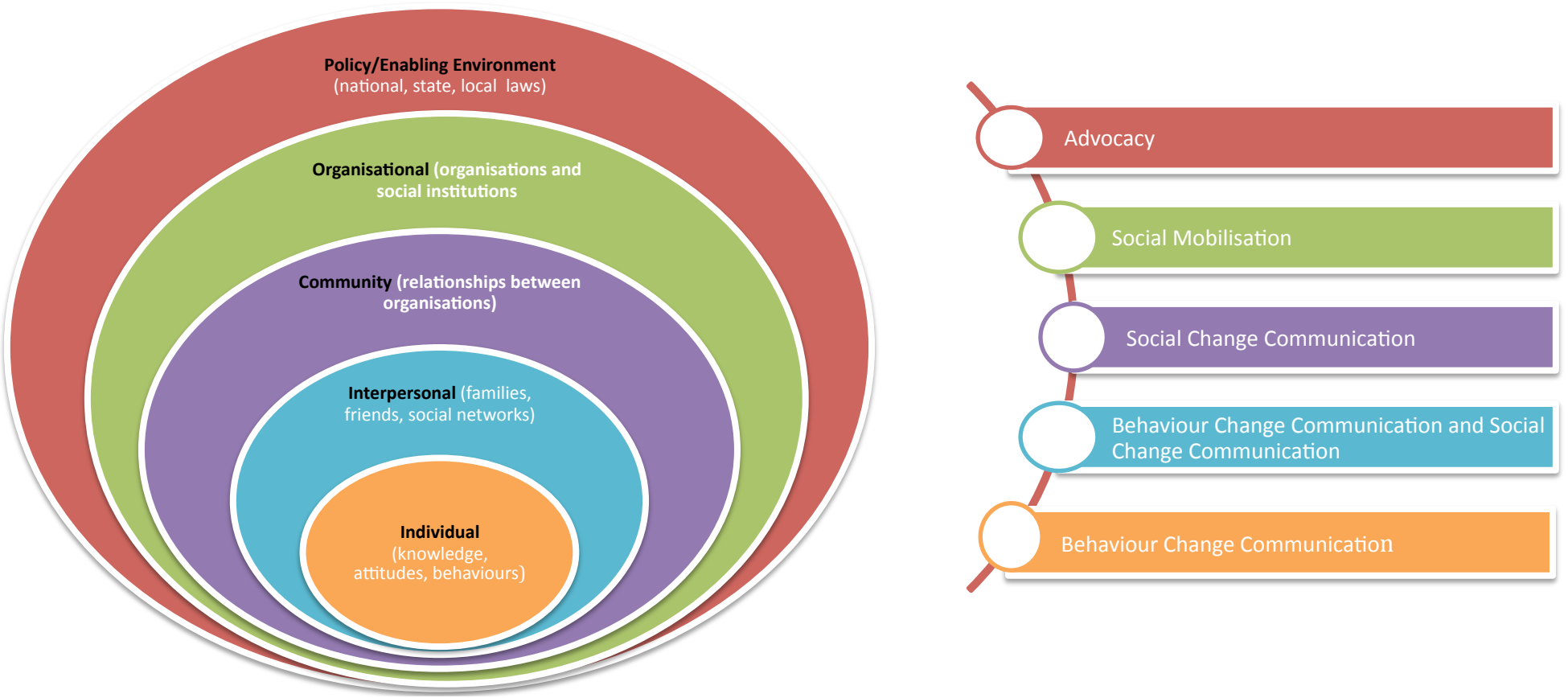
		Maternal and Child Survival strategy /plan	Immunization strategy/cMYP	Nutrition strategy/policy	Malaria strategy	WASH strategy
Interventions to Protect						
1	Exclusive breastfeeding for 6 months					
2	Adequate Nutrition					
3	Treatment & safe storage of household water					
4	Promotion of hand-washing with soap					
5	Community-wide sanitation promotion					
6	Reduce indoor air pollution					
Interventions to Prevent						
7	Measles vaccine					
8	Pertussis vaccine					
9	Spn vaccine					
10	Hib vaccine					
11	Rotavirus vaccine					
12	Prevention of HIV in children					
13	Co-trimoxazole prophylaxis for HIV-infected & exposed children					
14	Vitamin A supplementation of children					
Interventions to Treat						
15	Improved care seeking and demand generation within communities					
16	Health facility case management for pneumonia and diarrhoea					
17	Increasing access to appropriate care through CCM					
18	Oral rehydration therapy (Low Osmolarity ORS)					
19	Zinc treatment to children with diarrhoea					
20	Birth preparedness					

21	Skilled attendance at birth					
22	Improved care of maternal complications					
23	Improved care seeking for newborn complications					
24	Improved essential newborn care					
25	Improved care of sick newborns					

B) What are the key interventions where more action is needed? Highlight specific problems faced by communities and health service providers under the broad following headings.

Activity Area	Problems
Policy/strategy	- Map areas with UNICEF/MoH colleagues which do not have a supporting policy. - Ask for reasons why it is pending? - What are potential barriers and facilitators?
Planning, management and coordination	- Pneumonia, diarrhoea and newborn care involve many areas of intervention (immunization, skilled birth attendance, essential newborn care, breast feeding, hand hygiene, safe drinking water and good sanitation and reduced levels of air pollution). - How different players are brought together for a concerted response at the moment? - How can coordination be improved?
Human resources	- What are the key human resource gaps (numbers and competencies) and the key issues and possible solutions in relation to: - Immunization - IMCI - Health promotion at community level - Skilled attendance at delivery
Supply Chain Management	- In relation to the following, are there any stock outs for key essential supplies? Are supplies adequate? Are there any distribution/logistic issues? What are the solutions? - Vaccines - ORS - Zinc - Antibiotics - Soap for hand-washing - Running water - Toilet facilities
Advocacy	- How can high-level political commitment be ensured to address these 3 preventable causes of child deaths in your country? - What are the political leaders thinking about these problems? - To whom do they listen? - What will be the right time to highlight the issue? - What is more acceptable way of communicating the message to them? - A policy brief, an individual meeting, a presentation, a political gathering?

Appendix 6 – Social Ecological Model



The social ecological model and corresponding C4D approaches.

(Shefner-Rogers 2013)

Appendix 7 – Technology survey findings

Mobile phone use

Location	Ethnicity	Age	Relationship	Education	Income	Monthly credit?	Calls made/received?	Texts made/received?	Service
Tsagaannuur	Tsaatan	42	Mother	High School	130,000	15,000	Mother, Sister	Sister	Mobicom
Tsagaannuur	Darkhad	39	Mother	University	800,000	15,000	Husband	Sister, Brother	Mobicom
Tsagaannuur	Khalkh	30	Mother	University	800,000	30,000	Husband	Sister, Brother	Unitel
Tsagaannuur	Khalkh	34	Mother	High School	560,000	20,000	Mother	Cannot/Do not text	Mobicom
Tsagaannuur	Khalkh	31	Mother	High School	1,000,000	15,000	Sister	Sister	Unitel
Tsagaannuur	Khalkh	24	Mother	University	350,000	5,000	Husband	Mother	Unitel
Tsagaannuur	Khalkh	29	Mother	High School	500,000	10,000	Brother	Sister	Mobicom, Unitel
Tsagaannuur	Khalkh	30	Father	University	1,000,000	15,000	Father, Mother	Wife	Mobicom, Unitel
Tsagaannuur	Darkhad	15	Sister	High School	800,000	5,000	Friend	Friend	Mobicom
Tsagaannuur	Darkhad	31	Mother	High School	0	15,000	Brother	Husband	Mobicom
Tsagaannuur	Darkhad	28	Mother	University	300,000	20,000	Mother	Friend	Mobicom
Tsagaannuur	Darkhad	23	Mother	High School	280,000	15,000	Sisters	Friend	Mobicom
Tsagaannuur	Darkhad	27	Mother	University	400,000	25,000	Father	Friend	Mobicom, Unitel
Tsagaannuur	Darkhad	30	Mother	High School	500,000	5,000	Husband	Husband	Mobicom, Unitel
Tsagaannuur	Darkhad	24	Mother	University	500,000	10,000	Mother	Friend	Mobicom, Unitel
Tsagaannuur	Darkhad	27	Mother	University	420,000	15,000	Husband	Husband	Mobicom
Renchinlkhümbe	Darkhad	53	Grandmother	No	180,000	15,000	Daughter	Cannot/Do not text	Unitel
Renchinlkhümbe	Darkhad	45	Grandfather	University	100,000	15,000	Daughter	Cannot/Do not text	Unitel
Renchinlkhümbe	Darkhad	55	Grandmother	High School	183,000	5,000	Daughter	Cannot/Do not text	Unitel
Renchinlkhümbe	Darkhad	27	Mother	High School	700,000	Unknown	Husband	classmate's parents	Mobicom, Unitel
Renchinlkhümbe	Darkhad	28	Mother	High School	230,000	30,000	Husband	Friend	Unitel
Renchinlkhümbe	Darkhad	38	Mother	High School	0	15,000	Mother	Friend	Unitel
Renchinlkhümbe	Darkhad	26	Mother	No	900,000	20,000	Husband	Husband	Mobicom
Mörön	Khalkh	37	Mother	High School	40,000	15,000	Mother	Husband	Mobicom
Mörön	Khalkh	24	Mother	High School	20,000	15,000	Mother	Husband	Unitel
Mörön	Khalkh	23	Mother	University	1,000,000	Unknown	Husband	Husband	Mobicom
Mörön	Khalkh	55	Grandmother	High School	500,000	Unknown	Daughter	Cannot/Do not text	G mobile
Mörön	Khotgoid	31	Mother	No	0	15,000	Mother	Cannot/Do not text	G mobile
Mörön	Darkhad	25	Mother	High School	200,000	10,000	Sister	Friend	Mobicom
Mörön	Khalkh	20	Mother	High School	700,000	Unknown	Mother	Friend	Unitel
Mörön	Khalkh	28	Mother	High School	600,000	25,000	Colleagues	Friend	Mobicom, Unitel
Mörön	Sartuul	28	Mother	High School	0	Unknown	Husband	Husband	Mobicom
Mörön	Khalkh	31	Mother	High School	800,000	20,000	Husband	Husband	Mobicom
Mörön	Khalkh	27	Mother	University	500,000	25,000	Husband	Husband	Unitel
Mörön	Khalkh	25	Mother	University	1,500,000	Unknown	Husband	Husband	Unitel
Mörön	Khalkh	22	Mother	University	500,000	20,000	Husband	Husband	Unitel
Mörön	Khalkh	27	Mother	University	2,000,000	40,000	Doctor	Friend	Mobicom
Mörön	Khalkh	33	Mother	High School	60,000	Unknown	Husband	Cannot/Do not text	Unitel
Mörön	Khalkh	24	Mother	High School	40,000	Unknown	Mother	Bank	G mobile
Mörön	Khalkh	42	Grandmother	High School	0	15,000	Daughter	Cannot/Do not text	G mobile
Mörön	Khalkh	32	Mother	High School	20,000	Unknown	Husband	Sister	G mobile
Naliakh	Khalkh	23	Mother	High School	600,000	20,000	Husband	Husband	Skytel
Naliakh	Khalkh	50	Grandmother	High School	600,000	15,000	Daughter	Cannot/Do not text	Unitel
Naliakh	Kazakh	31	Mother	High School	280,000	35,000	Husband	Husband	Unitel
Naliakh	Khalkh	31	Mother	University	1,000,000	20,000	Husband	Colleagues	Unitel
Naliakh	Khalkh	27	Mother	University	600,000	15,000	Husband	Brother	Unitel
Naliakh	Kazakh	27	Mother	University	1,000,000	55,000	colleagues	Husband	Unitel
Naliakh	Khalkh	19	Mother	High School	800,000	20,000	Husband	Friend	Unitel
Naliakh	Kazakh	35	Mother	University	1,500,000	35,000	Husband	Husband	Unitel
Naliakh	Khalkh	27	Mother	High School	800,000	18,000	Mother	Sister	Unitel
Naliakh	Khalkh	29	Mother	High School	100,000	15,000	Husband	Sister	Mobicom
Naliakh	Kazakh	28	Mother	High School	500,000	15,000	Husband	Cannot/Do not text	Unitel
Naliakh	Khalkh	26	father	University	1,000,000	25,000	Colleagues	Wife	Unitel
Naliakh	Khalkh	22	Mother	High School	500,000	16,000	Husband	Husband	Mobicom
Naliakh	Kazakh	24	Mother	University	1,000,000	20,000	Husband	Husband	Mobicom
Naliakh	Khalkh	38	Mother	University	500,000	15,000	Husband	Friend	Skytel
Naliakh	Khalkh	27	Father	University	600,000	30,000	Wife	Wife	Unitel
Naliakh	Khalkh	35	Mother	University	1,000,000	30,000	Husband	Father	Unitel, G mobile
Naliakh	Khalkh	26	Mother	University	900,000	25,000	Mother	Husband	Unitel
Naliakh	Khalkh	25	Father	High School	500,000	20,000	Wife	Wife	Unitel
Naliakh	Khalkh	23	Mother	High School	700,000	10,000	Mother	Friend	Unitel
Naliakh	Sartuul	23	Mother	University	500,000	15,000	Husband	Mother	Unitel
Naliakh	Khalkh	26	Mother	High School	250,000	15,000	Husband	Brother	Unitel
Naliakh	Khalkh	33	Mother	High School	80,000	8,000	Husband	Husband	Unitel
Naliakh	Khalkh	45	Grandmother	High School	1,000,000	20,000	Children	Cannot/Do not text	Unitel
Naliakh	Khalkh	40	Mother	High School	500,000	8,000	Husband	Husband	Mobicom
Naliakh	Myangad	42	Father	High School	2,000,000	10,000	Husband	Cannot/Do not text	Skytel
Naliakh	Kazakh	24	Mother	High School	800,000	20,000	Husband	Cannot/Do not text	Mobicom
Naliakh	Kazakh	26	Mother	High School	1,000,000	10,000	Husband	Husband	Unitel
Naliakh	Khalkh	26	Father	University	1,500,000	35,000	Wife	Colleagues	Mobicom
Naliakh	Khalkh	27	Mother	High School	800,000	8,000	Husband	Husband	Mobicom
Naliakh	Khalkh	38	Mother	High School	800,000	15,000	Husband	Cannot/Do not text	Unitel

Naliakh	Khalkh	47	Grandmother	High School	800,000	20,000	Children	Cannot/Do not text	Mobicom
Naliakh	Khalkh	24	Mother	High School	900,000	10,000	Husband	Husband	Mobicom
Naliakh	Uriankhai	53	Grandmother	High School	430,000	5,000	Children	Cannot/Do not text	Unitel
Naliakh	Khalkh	43	Mother	High School	900,000	15,000	Children	Colleagues	Mobicom
Naliakh	Khalkh	25	Mother	High School	450,000	15,000	Husband	Husband	Unitel
Naliakh	Kazakh	43	Mother	High School	1,000,000	15,000	Children	Cannot/Do not text	Mobicom
Naliakh	Kazakh	40	Mother	High School	300,000	10,000	Daughter	Cannot/Do not text	Unitel
Naliakh	Khalkh	24	Mother	University	450,000	10,000	Husband	Husband	Mobicom
Naliakh	Khalkh	22	Mother	High School	500,000	15,000	Husband	Husband	Mobicom
Naliakh	Torguud	32	Mother	High School	800,000	15,000	Husband	Cannot/Do not text	Unitel
Naliakh	Khalkh	32	Mother	University	1,000,000	25,000	Mother	Cannot/Do not text	Unitel
Naliakh	Khalkh	31	Mother	University	800,000	20,000	Husband	Cannot/Do not text	Unitel

Television viewing practices

Location	Ethnicity	Age	Relationship	Education	Income	How often?	Favorite program?	Time of Day?	Hours watched?
Tsagaannuur	Tsaatan	42	Mother	High School	130,000	Everyday	MNB	Evening	1-2 hour
Tsagaannuur	Darkhad	39	Mother	University	800,000	Everyday	All	Evening	1-2 hour
Tsagaannuur	Khalkh	30	Mother	University	800,000	Everyday	MNB, UBS	Daytime	3-4 hour
Tsagaannuur	Khalkh	34	Mother	High School	560,000	Everyday	MNB, Movie Box	Evening	2-3 hour
Tsagaannuur	Khalkh	25	Mother	High School	500,000	Everyday	All	Evening	5-6 hour
Tsagaannuur	Khalkh	31	Mother	High School	1,000,000	Everyday	MNB	Evening	4 hour
Tsagaannuur	Khalkh	24	Mother	University	350,000	Everyday	MNB, 25, TV9	Daytime	5-6 hour
Tsagaannuur	Khalkh	29	Mother	High School	500,000	Everyday	MNB, TV9	Evening	6-7 hour
Tsagaannuur	Khalkh	30	Father	University	1,000,000	Everyday	All	Evening	3-4 hour
Tsagaannuur	Darkhad	15	Sister	High School	800,000	Everyday	MNB	Evening	2 hour
Tsagaannuur	Darkhad	31	Mother	High School	0	Everyday	Mongol TV	Evening	2 hour
Tsagaannuur	Darkhad	28	Mother	University	300,000	Everyday	MNB, TV9	Evening	4 hour
Tsagaannuur	Darkhad	23	Mother	High School	280,000	Everyday	All	Daytime	10 hour
Tsagaannuur	Darkhad	27	Mother	University	400,000	Everyday	MNB, UBS	Evening	1-2 hour
Tsagaannuur	Darkhad	30	Mother	High School	500,000	Everyday	MNB	Evening	3 hour
Tsagaannuur	Darkhad	24	Mother	University	500,000	Everyday	All	Evening	1-2 hour
Tsagaannuur	Darkhad	27	Mother	University	420,000	Everyday	MNB, UBS, Mongol TV	Evening	2 hour
Renchinlkhümbe	Darkhad	53	Grandmother	No	180,000	Everyday	All	Daytime	8-10 hour
Renchinlkhümbe	Darkhad	45	Grandfather	University	100,000	Everyday	MNB, Movie Box, 25	Evening	1 hour
Renchinlkhümbe	Darkhad	55	Grandmother	High School	183,000	Everyday	All	Evening	2 hour
Renchinlkhümbe	Darkhad	27	Mother	High School	700,000	Everyday	MNB	Evening	2-3 hour
Renchinlkhümbe	Darkhad	28	Mother	High School	230,000	Everyday	MNB, TV5	Evening	4-5 hour
Renchinlkhümbe	Darkhad	38	Mother	High School	0	Everyday	All	Evening	1-3 hour
Renchinlkhümbe	Darkhad	26	Mother	No	900,000	Everyday	MNB	Daytime	4-5 hour
Renchinlkhümbe	Darkhad	23	Mother	No	80,000	Everyday	MNB, TV9	Evening	3-4 hour
Mörön	Khalkh	37	Mother	High School	40,000	Everyday	MNB, TV9	Daytime	2 hour
Mörön	Khalkh	24	Mother	High School	20,000	Everyday	TV9	Daytime	8 hour
Mörön	Khalkh	23	Mother	University	1,000,000	Everyday	Mongol TV	Evening	3-4 hour
Mörön	Khalkh	55	Grandmother	High School	500,000	Everyday	MNB, TV5, TV8, TV9	Evening	2-3 hour
Mörön	Khotgoid	31	Mother	No	0	Everyday	All	Free time	3-4 hour
Mörön	Darkhad	25	Mother	High School	200,000	Everyday	25	Evening	2-3 hour
Mörön	Khalkh	20	Mother	High School	700,000	Everyday	UBS	Free time	5-7 hour
Mörön	Khalkh	26	Mother	High School	20,000	Everyday	MNB	Evening	1 hour
Mörön	Khalkh	28	Mother	High School	600,000	Everyday	All	Evening	1-3 hour
Mörön	Sartuul	28	Mother	High School	0	Everyday	All	Free time	4-5 hour
Mörön	Khalkh	31	Mother	High School	800,000	Everyday	All	Evening	3-4 hour
Mörön	Khalkh	27	Mother	University	500,000	Everyday	MNB	Evening	3-4 hour
Mörön	Khalkh	25	Mother	University	1,500,000	Everyday	All	Evening	3 hour
Mörön	Khalkh	22	Mother	University	500,000	Once a week	All	Evening	2-3 hour
Mörön	Khalkh	27	Mother	University	2,000,000	Everyday	MongolTV	Evening	4 hour
Mörön	Khalkh	33	Mother	High School	60,000	Everyday	MNB	Evening	1-2 hour
Mörön	Khalkh	24	Mother	High School	40,000	Everyday	All	Evening	3-4 hour
Mörön	Khalkh	42	Grandmother	High School	0	Everyday	MNB	Evening	1 hour
Mörön	Khalkh	32	Mother	High School	20,000	Everyday	MNB, TV5, TV8, TV9	Evening	4-5 hour
Naliakh	Khalkh	23	Mother	High School	600,000	Everyday	ETV, TV8, TV5, SBN	Evening	3-4 hour
Naliakh	Khalkh	50	Grandmother	High School	600,000	Everyday	All	Daytime	6-8 hour
Naliakh	Kazakh	31	Mother	High School	280,000	Everyday	TV5, Education TV	Daytime	2-3 hour
Naliakh	Khalkh	31	Mother	University	1,000,000	Everyday	All	Evening	5-6 hour
Naliakh	Khalkh	27	Mother	University	600,000	Everyday	Mongol TV, NTV	Evening	4-5 hour
Naliakh	Kazakh	27	Mother	University	1,000,000	Once a week	MNB, Education TV	Evening	1-2 hour
Naliakh	Khalkh	19	Mother	High School	800,000	Everyday	MNB	Daytime	3 hour
Naliakh	Kazakh	35	Mother	University	1,500,000	Everyday	MNB, 25	Evening	3 hour
Naliakh	Khalkh	27	Mother	High School	800,000	Everyday	All	Evening	2-3 hour
Naliakh	Khalkh	29	Mother	High School	100,000	Everyday	MNB	Evening	3-4 hour
Naliakh	Kazakh	28	Mother	High School	500,000	Everyday	MNB	Evening	3-4 hour
Naliakh	Khalkh	26	Father	University	1,000,000	Everyday	MNB	Evening	5 hour
Naliakh	Khalkh	22	Mother	High School	500,000	Everyday	TV5	Daytime	Free time
Naliakh	Khalkh	59	Grandmother	High School	145,000	Everyday	All	Evening	2-3 hour
Naliakh	Kazakh	24	Mother	University	1,000,000	Everyday	All	Evening	2 hour
Naliakh	Khalkh	27	Father	University	600,000	Once a week	All	Evening	1-2 hour
Naliakh	Khalkh	35	Mother	University	1,000,000	Everyday	All	Evening	2-3 hour
Naliakh	Khalkh	26	Mother	University	900,000	Everyday	MNB	Evening	4- 5 hour
Naliakh	Khalkh	25	Father	High School	500,000	Everyday	MNB	Evening	3-4 hour
Naliakh	Khalkh	23	mother	High School	700,000	Everyday	TV5, 25	All day	12 hour
Naliakh	Sartuul	23	Mother	University	500,000	Everyday	UBS, TV5	All day	5-6 hour
Naliakh	Khalkh	26	Mother	High School	250,000	Everyday	TV5	Free time	2-3 hour
Naliakh	Khalkh	33	Mother	High School	80,000	Everyday	Mongol TV, TV8	Evening	1-2 hour
Naliakh	Khalkh	45	Grandmother	High School	1,000,000	Everyday	TV9	Daytime	5-6 hour
Naliakh	Khalkh	40	Mother	High School	500,000	Everyday	MNB	Daytime	4 hour
Naliakh	Myangad	42	Father	High School	2,000,000	Everyday	MNB	Evening	2-3 hour
Naliakh	Kazakh	24	Mother	High School	800,000	Everyday	TV5	Evening	5-6 hour
Naliakh	Kazakh	26	Mother	High School	1,000,000	Everyday	TV5	Evening	5-11 hour

Naliakh	Khalkh	26	Father	University	1,500,000	Everyday	MNB, Mongol TV	Morning, Evening	1-2 hour
Naliakh	Khalkh	27	Mother	High School	800,000	Everyday	All	Evening	5-6 hour
Naliakh	Khalkh	38	Mother	High School	800,000	Everyday	MNB	Morning, Evening	2 hour
Naliakh	Khalkh	47	Grandmother	High School	800,000	Everyday	TV5, TV9	Evening	4-5 hour
Naliakh	Khalkh	24	Mother	High School	900,000	Everyday	UBS, MNB	Evening	8 hour
Naliakh	Uriankhai	53	Grandmother	High School	430,000	Everyday	All	Evening	2-3 hour
Naliakh	Khalkh	43	Mother	High School	900,000	Everyday	Mongol TV, TV9, NTV	Evening	2-3 hour
Naliakh	Khalkh	25	Mother	High School	450,000	Everyday	TV8, TV5	Daytime	3-4 hour
Naliakh	Kazakh	43	Mother	High School	1,000,000	Everyday	UBS, Mongol TV	Evening	3-4 hour
Naliakh	Kazakh	40	Mother	High School	300,000	Everyday	All	Evening	2 hour
Naliakh	Khalkh	24	Mother	University	450,000	Everyday	All	Evening	4-5 hour
Naliakh	Khalkh	22	Mother	High School	500,000	Everyday	TV5	Daytime	6-8 hour
Naliakh	Torguud	32	Mother	High School	800,000	Everyday	MNB, C1	Evening	3 hour
Naliakh	Khalkh	32	Mother	University	1,000,000	Everyday	SBN, 25, TV9	Evening	2 hour
Naliakh	Khalkh	31	Mother	University	800,000	Once a week	TV5, UBS	Evening	1 hour

Radio practices

Location	Ethnicity	Age	Relationship to child	Education level	Monthly income	How often?	Favorite station?	Time of day?	Average hours listened?
Tsagaannuur	Tsaatan	42	Mother	Secondary	130,000	Everyday	Only one available	7-8pm	1-2 hour
Tsagaannuur	Khalkh	24	Mother	University	350,000	Once a week	Only one available	Daytime	2 hour
Tsagaannuur	Darkhad	28	Mother	University	300,000	Everyday	Only one available	Morning	1-2 hour
Renchinlkhümbe	Darkhad	53	Grandmother	No	180,000	Everyday	Only one available	Morning	1-2 hour
Renchinlkhümbe	Darkhad	23	Mother	No	80,000	Everyday	Only one available	Daytime	3 hour
Mörön	Khalkh	23	Mother	University	1,000,000	Once a week	FM 98.1	Evening	1 hour
Mörön	Khalkh	55	Grandmother	Secondary	500,000	Everyday	National Radio	When driving	3-4 hour
Mörön	Khotgoid	31	Mother	No	0	Once a week	National Radio	Evening	1 hour
Mörön	Khalkh	20	Mother	Secondary	700,000	Less than once a week	National Radio	Daytime	1 hour
Mörön	Khalkh	26	Mother	Secondary	20,000	Less than once a week	National Radio	Morning	2 hour
Naliakh	Khalkh	50	Grandmother	Secondary	600,000	Less than once a week	National Radio	Daytime	1 hour
Naliakh	Khalkh	22	Mother	Secondary	500000	Not at all	National Radio	Morning	30 minutes
Naliakh	Khalkh	38	Mother	University	500,000	Everyday	FM 104.5	Daytime	2 hour
Naliakh	Khalkh	26	Mother	University	900,000	Less than once a week	FM 104.5	Evening	1 hour
Naliakh	Khalkh	23	Mother	Secondary	700,000	Once a week	FM (non-specific)	During free time	30-40 minutes
Naliakh	Sartuul	23	Mother	University	500,000	Once a week	FM (non-specific)	Daytime	3-4 hour
Naliakh	Kazakh	24	Mother	Secondary	800,000	Once a week	FM (non-specific)	Daytime	2-3 hour
Naliakh	Kazakh	26	Mother	Secondary	1,000,000	Everyday	National Radio	Morning	1-2 hour
Naliakh	Khalkh	27	Mother	Secondary	800,000	Everyday	FM (non-specific)	Daytime	1-2 hour
Naliakh	Khalkh	24	Mother	Secondary	900,000	Less than once a week	National Radio	During free time	3-4 hour
Naliakh	Khalkh	43	Mother	Secondary	900,000	Everyday	FM (non-specific)	Daytime	2-3 hour
Naliakh	Khalkh	22	Mother	Secondary	500,000	Once a week	National Radio	Morning	1 hour
Naliakh	Torguud	32	Mother	Secondary	800,000	Once a week	National Radio	Morning	1 hour

Internet practices

Location	Ethnicity	Age	Relationship	Education	Income	How often?	Purpose?	Time of day?	Hours spent?
Tsagaannuur	Darkhad	39	Mother	University	800,000	Less than once a week	News	Daytime	1-2 hour
Tsagaannuur	Khalkh	25	Mother	high school	500,000	Less than once a week	News	Daytime	1-2 hour
Tsagaannuur	Khalkh	24	Mother	University	350,000	three time a week	News, Facebook	Morning	1 hour
Tsagaannuur	Darkhad	15	Sister	High School	800,000	Once a week	News, Facebook	Daytime	1 hour
Tsagaannuur	Darkhad	24	Mother	University	500,000	Once a week	Email, Facebook	Daytime	2 hour
Tsagaannuur	Darkhad	27	Mother	University	420,000	Less than once a week	News	Daytime	2 hour
Mörön	Khalkh	23	Mother	University	1,000,000	Everyday	News	Daytime	4-5 hour
Mörön	Khalkh	55	Grandmother	High School	500,000	Everyday	News, Email	Daytime	3 hour
Mörön	Khalkh	28	Mother	High School	600,000	Everyday	Work	Daytime	4-5 hour
Mörön	Khalkh	31	Mother	High School	800,000	Once a week	News	Daytime	30-40 minute
Mörön	Khalkh	27	Mother	University	500,000	Once a week	News	Evening	1 hour
Mörön	Khalkh	25	Mother	University	1,500,000	Less than once a week	News, Facebook	Evening	1 hour
Mörön	Khalkh	22	Mother	University	500,000	Everyday	Google, Facebook	Daytime	4-5 hour
Mörön	Khalkh	27	Mother	University	2,000,000	Everyday	Varies	Daytime	12 hour
Naliakh	Khalkh	23	Mother	High School	600,000	Once a week	News, Facebook	Daytime	2 hour
Naliakh	Kazakh	27	Mother	University	1,000,000	Everyday	News	Daytime	5-6 hour
Naliakh	Khalkh	19	Mother	High School	800,000	Everyday	News, Facebook	Daytime	2-3 hour
Naliakh	Kazakh	35	Mother	University	1,500,000	Everyday	Email	Evening	2 hour
Naliakh	Kazakh	24	Mother	University	1,000,000	Everyday	Chat	Daytime	20-30 minute
Naliakh	Khalkh	27	Father	University	600,000	Everyday	Varies	Daytime	2 hour
Naliakh	Khalkh	35	Mother	University	1,000,000	Less than once a week	News	Daytime	1 hour
Naliakh	Khalkh	26	Mother	University	900,000	Everyday	New, Music	Evening	2 hour
Naliakh	Khalkh	33	Mother	High School	80,000	Once a week	Banking	Daytime	30 minute
Naliakh	Myangad	42	Father	High School	2,000,000	Everyday	News	Daytime	1 hour
Naliakh	Khalkh	26	Father	University	1,500,000	Everyday	Email, Facebook	Morning	20-30 minute
Naliakh	Khalkh	27	Mother	High School	800,000	Once a week	Entertainment	Daytime	2-3 hour
Naliakh	Khalkh	38	Mother	High School	800,000	Once a week	News	Evening	2 hour
Naliakh	Khalkh	24	Mother	High School	900,000	Once a week	News	Evening	1-2 hour
Naliakh	Khalkh	43	Mother	High School	900,000	Less than once a week	Work	Daytime	1-2 hour
Naliakh	Khalkh	25	Mother	High School	450,000	Once a week	Chat	Daytime	1-2 hour
Naliakh	Khalkh	24	Mother	University	450,000	Once a week	News, Email	During free time	2 hour
Naliakh	Khalkh	32	Mother	University	1,000,000	Everyday	News, Chat	Evening	4 hour
Naliakh	Khalkh	31	Mother	University	800,000	Everyday	Work	Daytime	6 hour

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