Where there is no weighing scale

Manuscript Details

Manuscript number	WSIF_2016_182
Title	Where there is no weighing scale: newborn nourishment and care in Pakistani Punjab
Article type	Research Paper

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Manuscript region of origin	Europe
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A third of babies in South Asia are born low birthweight, more than in sub-Saharan Africa. This epidemiological enigma has been linked to gender and generational inequalities and to poor health and nutrition over the whole of women's lives. High rates of breastfeeding initiation are accompanied by high rates of colostrum avoidance, the giving of prelacteal feeds and early supplementation with formula or animal milks as well as other substances. Meanwhile, in Pakistan – despite the extensive presence of public community maternal and child health workers – very few babies are weighed at birth. This paper draws on an ethnographic study conducted in 2014-16 in rural and urban Punjab, to shed light on the interpretation, nourishment and care of newborns who are identified to be *kamzoor* (weak), and to comment on the extent to which carers' efforts are influenced by community health workers, who are charged with spreading modern biomedical knowledge and practices. *Kamzoori* is understood to be caused by maternal depletion and is managed very simply at home by augmenting breastfeeding and giving supplementary milks, and by keeping the baby warm and massaged. In cases where weak newborns do not recover weight, spiritual explanations are invoked and treated through a variety of home remedies/methods. There are often similarities between the interpretations of mothers, grandmothers, and health workers. The paper therefore considers health workers to be engaged in complex cultural translations.

Key words

Pakistan; newborns; low birthweight; breastfeeding; healing; community health workers

Introduction

Soraya is in her mid-20s and lives in a village in Punjab. Her first daughter was born at seven months. Soraya believed that the delivery had begun prematurely because she had worked prodigiously hard during the pregnancy. 'All my *jethanian* (husband's brothers' wives) have moved out into their own houses, so I was the only daughter-in-law left to do all the work'. She delivered the baby at a state hospital and she was very *kamzoor* (weak) at birth. Describing her daughter as a newborn, she told us, 'she looked like a little mouse', making a cupping gesture with her hands. When we asked about the birthweight, Soraya could not tell us. 'They don't weigh babies at the hospital', she said. The doctor who delivered her Soraya to give her formula milk, as well as breastfeed her, because she was so small that she would need extra nutrition. But the baby preferred to suck from the feeding bottle than from the nipple, and the breastfeeding did not take off. Her daughter is now nearly a year old. Soraya still has a feeling of wonder that this fragile creature managed to survive. 'My mother was thinking, "*yeh nahi bachnewali*, this one isn't going to make it". But she didn't say that in front of me at the time, in case it broke my heart', she told us with an opaque laugh.

Among the women we have interviewed, Soraya's story is unremarkable both in her daughter's low birthweight, in the alacrity with which her breastfeeding was compromised by the encouragement to supplement with other milks, and also because her baby was not weighed at birth. The weighing scale is a quintessential symbol of the normalization of infant nutrition by biomedical science, a tool that allows a newborn's body to be measured and positioned in an international growth curve. It is also a quintessential symbol of state authority. Writing about the Dani people in Irien Jaya in Indonesia, anthropologist Leslie Butt (1998) describes the weighing scale as a potent instrument of the state. Government record cards are ubiquitous reminders about the importance of weighing their infants, intimating to mothers that the health of their baby is a public affair. If the baby lags in the growth charts, careering towards the red line demarcating the limits of acceptable growth, they are berated by health workers for their inadequacy as mothers. Butt writes

in a vein of scholarship on reproduction that is critical of the intrusiveness of state health policies. But in our study, as Soraya's example suggests, the weighing scale was conspicuous by its absence.

Where there is no weighing scale, how do carers then reckon the health of a newborn? Where growth is not monitored, how do carers respond to the vulnerability of a weak baby? And to what extent are they influenced by the health services provided by the state?

Low birthweight, maternal undernutrition and neonatal feeding

Nearly third of babies in South Asia are born at what is classed as low birthweight, a statistic far greater than in sub-Saharan Africa, where – despite making lesser progress than South Asia in many of the wider determinants of infant nutrition – only 15% of babies are born less than 2500g (UNICEF and World Health Organization, 2004, p.8). The late Vulimiri Ramalingaswami *et al. (1996)* called this puzzle the 'Asian enigma'. In their classic enunciation of the problem, they suggested that the enigma revealed the extremity of gender inequalities in South Asia. Low birthweight indicates that the infant was malnourished in the womb and/or that the mother was malnourished during her own infancy, childhood, adolescence and/or pregnancy. The proportion of babies born with low birthweight therefore reflects the health condition of women over the whole of their young lives; 'the exceptionally high rates of malnutrition in South Asia are rooted deep in the soil of inequality between men and women' (p.11). Later, their hypothesis was confirmed by the International Food Policy Research Institute, who found that measures of women's low status are the biggest driver of the gap in child nutrition between South Asia and sub-Saharan Africa (Smith *et al.*, 2003).

In Pakistan, epidemiological surveys leave little doubt that this 'ignominy of low birthweight' (Bhutta, 2012) is driven by poor maternal health. National estimates of low birthweight are approximate, of course: in the latest Demographic and Health Survey, from 2012-13, only 12% of infants had been weighed at birth (Measure DHS, 2013, p.148). Nevertheless, according to the World Bank (2015), in 2010, some 32% of infants born in Pakistan were below 2500g. In relation to maternal health, the 2011 National Nutrition Survey showed that 18% of women of reproductive age

were underweight and half the pregnant women were anaemic (Government of Pakistan, 2011, p.28 and p.30). This bleak picture regarding the proximate influences on newborn and maternal health is matched by the wider picture of poverty, inequalities between urban and rural areas, provinces, religious communities, sects and castes, and gender and generational inequalities in virilocal family structures (Oppenheim-Mason, 1997; Winkvist and Akhtar, 2000; Towghi, 2007; Varley, 2008; Bhatti and Jeffery, 2012; Mumtaz *et al.*, 2014). Women's health-seeking depends typically on the cooperation of their affinal kin, embedding their recourse to healthcare, then, also within these gender and generational inequalities (Mumtaz and Salway, 2006). As Mumtaz and Salway (2009) have also shown, the power dynamics of women's marital homes may be softened by the textures of their relationships. It is not necessarily the case that the most 'autonomous' women are the ones most able to seek healthcare. It may rather be those who are the most 'central' – who work to make themselves indispensible to their in-laws – who are best supported to do so.

Surveys in Pakistan have found that breastfeeding initiation rates are high, especially in the least wealthy families. However, rates of colostrum avoidance are also high, as is the giving of prelacteal feeds during the first three days after birth and early supplementation with animal and formula milks and other substances (see inter alia Khan, 1991; Morisky *et al.*, 2002; Ali *et al.*, 2011; Hanif, 2011; Premani *et al.*, 2011; Ahmed *et al.*, 2014; Chaudhry *et al.*, 2014). Ninety two percent of children born in the two years previous to the Demographic and Health Survey had been breastfed at some stage, but only 18% were breastfed in the first hour after birth and only 58% were breastfed in the first day after birth. Meanwhile, 75% of babies were given something other than breastmilk to drink during the first three days of life (Measure DHS, 2013, p.169). The estimates from the 2011 National Nutrition Survey are somewhat higher, indicating that 40% initiated breastfeeding within an hour of birth (Government of Pakistan, 2011, p.46). Both these national surveys confirm that early breastfeeding is least common in Punjab, the province where we worked.

There are relatively few sociological-anthropological studies to shed light on these infant feeding practices, although Dorothy Mull's (1991; 1992) detailed work on Karachi slums is an

important exception. Her studies indicate pervasive mistrust of the nutritional quality of mother's milk and fears of spiritual malevolence in the form of jealous *nazar* (evil eye) or a *saya* (shadow/spirit) cast by a ritually unclean woman. Anxieties about the susceptibility of breastmilk to the spoiling effects of a mother's exposure to excessive cold or heat, her dietary indiscretions, or a new pregnancy are further influencing factors. Mothers readily reported a spoiling or drying up of breastmilk. Mull also describes mothers seeking breastmilk testing from folk healers alongside what she calls 'pseudoscientific' testing, namely medically needless assessments from private pathology labs. Meanwhile, another study of Karachi slums, by Fikree *et al. (2005)*, explains the giving of *ghutti* (prelacteal feeds) in terms of mothers' preoccupation with cleaning out the newborn's abdomen or with encouraging newborns to urinate frequently and thereby dissipate the heat that is understood to be brought into them by childbirth. Similarly, they find that mothers avoid colostrum because they believe is foul milk that has been stagnant in the breasts for nine months.

This paper builds on these studies by exploring ethnomedical etiologies of neonatal nourishment and care. Secondly, we explore the extent to which these are being scrutinized by health workers, who have been charged by the state with trying to shift these views.

Maternal and child health workers

Pakistan has an extensive cadre of primary healthcare practitioners who have been given training by the government specifically to spread modern biomedical knowledge and practices concerning maternal and child health. The largest of these cadres of state health workers, the Lady Health Workers (LHWs), has been in operation since 1994, when it was established with the assistance of the World Health Organization in the policy ambience following the Alma Ata conference (Hafeez *et al.*, 2011). LHWs are women members of the community who must have at least eight years of formal education. They undergo 18 months of government training to provide a door-step service of more than twenty family planning, antenatal and child health services. Our examination of LHW training materials confirms our observations and conversations with LHWs, in that this training seems

designed to raise their awareness of biomedical science in order to enable them to filter out the 'good' aspects of traditional practices from the 'superstitious' and harmful, such as the taboo on colostrum and the giving of prelactal feeds (see e.g. UNICEF/*Mehekma-e-Sehat*, 2010, p.10, p.17 and p.28 for examples. There is a remarkable fit between the health promotion messages that the LHWs are charged with disseminating and the colonial discourse that Saha, in this issue, illuminates from turn-of-the-century India decrying how 'the unfortunate baby is given honey, sherbert, a concoction of ghur and spices, bazar milk, in fact anything but its mother's milk', p.TBC).

In theory, a LHW serves a population of 1000 people and extends these services through monthly home visits. In addition, her own residence is designated as a Health House where people can come as a first port of call for guidance or treatment. Each LHW is supposed to be supplied with basic items for her Health House and essential drugs to treat minor ailments, in addition to contraceptives, to be provided free to the population in her catchment area. The programme now operates in 60-70% of rural and urban slum populations, and there are more than 100,000 LWHs across Pakistan. Evaluations of the programme show that health indicators are significantly better than the national average, in the areas served by the LHWs. However, the evaluators identified serious weaknesses, most notably the irregular provision of drug supplies, delayed disbursement of remuneration and poor district health system referral support (see Hafeez, Mohamud et al., 2011, p.214; Khan, 2011, p.28). A qualitative study by Mumtaz *et al*. (2013) identifies systematic obstacles because of the mobility constraints upon LHWs, which limit the amount of home visiting they undertake, and caste-based village hierarchies which discourage LHWs from visiting beyond their own *biradaris* (extended families). The programme is also hampered by the deleterious effects of interwoven vertical campaigns, most notably since LHWs have been tasked with the polio eradication campaign, but also the malaria campaign, TB-Directly Observed Therapy Strategy, health emergency response activities and disease surveillance. LHWs' strong local access to women has made it tempting for health policy makers to delegate more and more responsibilities to LHWs, and interventions indicate that the LHW training programme can be effectively extended to absorb

additional skill sets to be integrated into their service (Bhutta *et al.*, 2011). However, LHWs complain of being overburdened and under-compensated for extra activities (Closser, 2015).

In addition to the LHW programme, Pakistan also has also from time to time trained and employed Traditional Birth Attendants – called *dai*s in Punjabi – to provide community-based maternal and child health activities. In Saha's paper, in this issue, she discusses colonial discourse about the 'dirty' and 'dangerous' *dai* who was blamed for the soaring maternal and infant mortality in 19th century India. The colonial 'civilizing missions' set up institutions to re-train *dai*s, but worried that they would 'very quickly revert to their old methods' (p.TBC). Towghi (2004) shows continuities in Pakistan, where *dai*s have been in the on-off employment of the government since the 1960s to provide first family planning, and then community maternal and child health services, only to be discontinued each time in a climate of scepticism about their level of modern health knowledge and skills. Currently, *dai*s are given government training to conduct community-based maternal and child health activities in collaboration with the LHWs, and the Government of Pakistan 'acknowledges that this cadre will continue to function for the foreseeable future' (Atwood *et al.*, 2010, p.viii and p.8). However, the scepticism about *dai*s endures. In 2006, therefore, Pakistan launched a new cadre of community-based midwives to try – amongst other aims – and attract antenatal mothers who would switch from paying a *dai* to paying a community midwife, and to foster cooperation with public health facilities for referrals. A qualitative evaluation by Mumtaz *et al. (2015)* indicates that the programme is failing on both counts, because the community midwives are clustered in well-provided areas where they enter direct competition with physicians, Lady Health Visitors – a class of more highly-trained community maternal and child health workers – and other government and private-sector midwives. The hostility of this competition is augmented by the fact that most public-sector providers also 'moonlight' in the private sector (p.254).

Our paper builds on understandings of Pakistan's community maternal and child health workers by showing how, in our research sites, they influence women's ideas and practices concerning their own health during pregnancy, and the nutrition and care of newborns.

Research setting and methods

This paper draws from an ethnographic study which was supported by the John Fell Foundation of the University of Oxford between 2014-16 under the working title *Modern Motherhood in Pakistan*. The research aims to understand what being a mother in contemporary Pakistan means and involves. We intended to examine diversity and change across generations of kin, as in earlier work we found that linear accounts of social change in the family are substantially complicated by the intergenerational mobility of practices, ideas and values between mothers and daughters (Pooley and Qureshi, 2016). Consequently, we have adopted an intergenerational approach incorporating, to date, interviews with 30 new mothers alongside interviews with their mothers and/or mothers-in-law. This allows us to explore motherhood as a lifelong relationship, one that does not diminish when children grow up and have their own families but may in fact be enhanced, particularly at intense transitional moments such as the birth of a new baby. In the postpartum, the nourishment and care of newborns emerged to be a prime concern of mothers and grandmothers.

We have been working in two sites in Punjab: two neighbouring villages, and a working class urban neighbourhood to the south-east of Lahore. The sites are connected by a main road. In one of the villages, landowning families have profited from selling off their land for recent peri-urban development, and there is a sizeable cluster of two-storey brick houses in the central Muslim colony which are furnished with UPS electricity storage facilities, generators and air-conditioners to relieve the intense heat of the summer months. Such households boast gas cooking facilities, fridges, washing machines and other labour-saving appliances. A domestic servant might be employed to further lighten the household women's workload. In most of the Muslim houses in both villages, however, the hum of the ceiling fans is stilled six to eight hours a day because of electricity shortages. Food and milk rapidly turns bad in the fridge, use of electrical appliances is limited by electricity load-shedding, and cooking on gas cylinders is rationed because of the cost. Women wash clothes by hand and sweat to cook over fire stoves fed with wood. Houses in the Christian colonies of both villages –

subjugated by their status as a religious minority and by their lower caste origins – are worse furnished, making for a more arduous workload for women. In the urban community, conditions largely resemble those in the less wealthy Muslim houses in the villages. A minority of the mothers we interviewed in the wealthier houses in the villages, and in the urban community, were educated to BA level, but only one had done any professional work. Referring to the lack of opportunities to use one's qualifications, and the tendency for parents to get their daughters married before they had a chance to work, a mother in the wealthier village quipped, 'do you know what BA means? *Bekar aurat* (useless woman)'. Most of the mothers identified themselves as *kam parhi* (less educated, up to about 8th grade) or *an-parh* (uneducated, or up to 5th grade).

In the wealthier village, the Basic Health Unit was upgraded by a national NGO in the 1990s, with project funding from the German government. For nearly thirty years, the village has two Lady Health Visitors, and now also a gynaecologist-obstetrician, paid for by the NGO in addition to the LHWs in the pay of the government. The NGO has provided training to three *dai*s, and there is also a community midwife. In the other village, the NGO has only worked for two years, and their outreach is less extensive. There is a Basic Health Unit located inconveniently out in the middle of a field, there are the Health Houses of the Lady Health Workers, and there are two community midwives. There are a number of private biomedical health facilities on the main road leading back to Lahore, including two private hospitals. In the urban community, there is a wider range of public and private health facilities, and the state-funded community health services are less prominent.

In the villages, we have been following the community health workers, going with them on their visits, observing their consultations with pregnant and new mothers and carrying out interviews with some of their clients. We aimed for theoretical sampling, interviewing mothers from different wealth strata of the villages, religious communities and neighbourhood colonies. Recalling the findings of Mumtaz *et al.* (2013), however, the health workers themselves admitted that they were better connected with households from their own *biradari*s, and that in other households they had to work hard to get access. As Shazia, one of LHWs, explained, 'they only let us into their houses

when we have free medicines to offer them from the government. Otherwise they tell us "go away, leave us alone, we know how to have babies, we've all had huge families, we are *tajerbakaar auraten* (experienced women)"'. In the urban community, we worked with the help of a local grandmother who is well-connected through family, neighbourhood and employment networks.

The project was ethically reviewed by the University of Oxford Central Research Ethics Committee and approved on the understanding that women give their verbal permission to take part in the project after hearing an explanation of its aims and objectives, may withdraw from the study at any time, that we will protect participants' identities carefully, and that we remain vigilant to anticipating any harms that might befall participants from taking part in the research. Thankfully, we have not yet had to face dilemmas about how to intervene to avert the possibility of acute neonatal harm or imminent death, as happened to Scheper-Hughes (1992) in her momentous work on child health in the North-East of Brazil. But in anticipation of such a crisis, we have familiarized ourselves with the secondary and tertiary health services in the environs.

Interpretations of weakness in the newborn

Women distinguished between the weight of a newborn, and their health per se. Weight was something abstract, something that could only be established by a biomedical health practitioner using a weighing instrument. A grandmother in Lahore told us 'you hear about that happening in big hospitals. They tell you in pounds don't they, that "the baby was 10 pounds", but in all my years, I have never seen anything like that happening myself'. Only two of the 30 mothers reported that their newborn was weighed at birth, one in a government hospital in Lahore and the other at the health unit in the village. This did not seem to matter very much, though, because they – like the grandmothers we spoke to, the LHWs and the *dai*s and midwives – were confident about their ability to judge the health of a newborn without measuring it in a scale. The typical responses we received to questions about weighing went like this. 'How was the weight of the baby when he or she was born?'. '*Sehatmand* (healthy)' or '*kamzoor* (weak)', they told us, gesturing with their hands. 'Was he

or she weighed at birth?'. 'No', most of them replied. 'So how did you know the *sehat* (health) of the baby?'. 'Because you can tell if a baby is *sehatmand* just by looking at it!' they told us, laughing at our obvious question. The *sehat* of a baby could easily be told by observing, feeling and holding the baby. It was an experiential and sensuous judgement rather than a quantitative statement like weight. It is significant here that the term *sehat* covers the broad connotations of the English health, but also more narrowly connotes fatness. The antonym of *sehatmand* is *kamzoor*.

Primarily, the mothers in our study attributed weakness in the newborn to dietary inadequacy and to the burden of domestic work on women during their pregnancies. Indeed, women saw it as almost indexical of the care given to antenatal mothers. Saadia was a very thin woman from an outlying household in the wealthier village. She had two daughters under the age of two. Both of her daughters had been born at full term like 'little mice', she told us. 'Have you seen me? I am nothing but dry bones. How can a mother who is so *kamzoor* feed a baby inside her womb?'. Saadia was the wife of a truck driver who gave most of his earnings to his parents and handed her only Rs200 a month for her to run the household, US$2, a pittance by any standard. She lived in a joint family and complained of hostile relationships with her mother-in-law and sister-in-laws, who made her do their share of the housework throughout her pregnancies.

Women were cognizant that pregnancy is an unusual state that requires a woman's diet to be increased. They held that antenatal mothers needed to eat more food in order to increase the *khoon* (blood) inside them and thereby ward off *kamzoori*. 'It's the mother's diet that makes the baby. If the mother eats well then *us ka khoon bharta hai*, it makes her blood increase, and then the baby grows to be *sehatmand*. If the mother doesn't eat well then the baby will be weak', explained another mother in the first village. The depletion of blood led to a state of insufficiency which was dangerous for the health of the woman and for the development of the baby. Whilst the Urdu term for anaemia is *khoon ki kammi*, literally a lack of blood, we believe that women were not talking here about the disease anemia but a more local condition of insufficient blood or force.

During the early stage of pregnancy, the *kache macheene* (raw/unfirm months), women said it was prudent to reduce one's workload so as to not dislodge the baby by excessive movement. By contrast, during the final months, it was good to do heavy chores and be as active as possible, to bring on a timely delivery. Women, and also the health workers, attributed weakness in a newborn to the uncompromising demands of husbands and in-laws who insisted on making a woman work hard throughout their pregnancy. 'Obviously, if she's going to be doing heavy housework for her in-laws during the pregnancy, then whatever diet she takes, it isn't going to be enough for her and the baby', lectured Salma, a Lady Health Visitor in the wealthier village. 'They [the in-laws] need to think, it's the baby's health that's going to suffer'. Complicating this story of blame-worthy in-laws, however, our observations indicate that the assistance with domestic chores extended to a pregnant woman is very much influenced by the quality of her relationships with her husband and her in-laws. Sana, a mother in Lahore, explained the differences between her and her sister:

> My in-laws are very good to me, they really looked after me. During the pregnancy there were certain smells that I couldn't bear. When I used to cook onions it used to make me sick, so my mother-in-law used to do the cooking. My father-in-law stopped bringing certain things into the house, like *methi* (fenugreek leaves) and *ojri* (intestines) even though he is partial to those [both rather pungent foods]. If you compare with my sister, her in-laws are not good with her. Her mother-in-law prefers her *jethani* (older sister-in-law) who is also pregnant these days. They get my sister to do all the cooking and they make her wash their clothes by hand. But isn't my sister pregnant too?

Sana's sister was currently staying at their mother's house because she had become exhausted by the cooking, cleaning and hand-washing in her marital home. By contrast, Sana had not returned to her mother's home even during the *chilla* (40 days postpartum rest) when it was traditionally entitled to her. Because her mother-in-law had been good to her during her pregnancy, she felt that

she ought to pay her back by not deserting her. We can see here that when women work relentlessly throughout their pregnancy, it may not be simply because of uncompromising in-laws, but because they want to remain 'central' in their marital homes (Mumtaz and Salway, 2009).

In wealthier households, and in cases in which women enjoyed good relationships with their in-laws, women reported increasing their intake of milk, meat and fruit during pregnancy. In poorer households, and in cases where women were not well-regarded or prioritized in their marital homes, women reported doing nothing to increase their dietary intake except eating a larger amount of chapatti with their routine meals. 'I couldn't afford anything but *sukhi roti* (dry chapatti)', said a mother in Lahore of her latest pregnancy. A mother in a poorer household in the first village told us her husband had encouraged her to drink a glass of milk every night before bed, but only until the ultrasound test diagnosed that she was carrying a baby girl. After this, his support diminished. Her sister-in-law, who was listening in on the interview, laughed that this was her story too.

Community health workers encouraged women to prioritize their diet, increase their food intake and eat *taaqat ki cheezen* (fortifying foods) during pregnancy. But they did so carefully, tailoring their advice to the women's domestic situations. In the Christian colonies and poorer outlying households of the villages, for example, they advised women to eat twice their normal number of chapattis rather than telling them to eat unaffordable items such as meat or fruit. Significantly, community health workers did not talk to women about their diet using biomedical nutritional concepts such as the macro- and micronutrient groups, but using food categorizations that are more locally resonant. Mothers and grandmothers talked about food categorizations entailing contrasting *taseer* (properties/effects) of hot and cold, and other contrasting categories such as dry and oily, and soft and hard. These popular ideas are reflected in humoural medical systems such as Unani Greco-Islamic medicine and Ayurveda (Lewis and Young, 1992). These are also shared by health workers themselves. For example, our efforts to talk with a midwife in the first village about fibre suggested that the concept of dietary fibre, though covered in the training she had been given from the government, had not resonated with her. When after an interview we asked

whether fibre might be beneficial for a toddler who was suffering from constipation, she thought the examples we gave – brown rice and bread – would exacerbate constipation because they are *sukht* (hard) and difficult to digest. We routinely observed Lady Health Workers, *dai*s and community midwives telling women to limit their consumption of heating foods such as chicken or fish until the very end of their pregnancies, because in the early stages, an excess of heat could result in the mother producing such a large volume of blood that she could miscarry.

Nourishment and care

A newborn presenting as *kamzoor* (weak) was a cause for concern but, as suggested by the case of Soraya with which we began, it was not an unusual state of affairs. The most common course described for managing the vulnerability of a small baby was to simply feed it more frequently, with breast and other milks. During the winter months, it was also important to keep weak newborns warm by wrapping them up in clothes or swaddling them, and by massaging their bodies all over with finely sieved wheat flour. Mothers of weak newborns were supposed to keep themselves warm too, so that their coolness would not be transmitted through their breastmilk.

Across the 30 mothers, breastfeeding was the main form of initial nutrition for all but five of the newborns. In the five cases where mothers did not start out breastfeeding, in three cases this was because the baby had been delivered by caesarean section and the mothers were feeling too *kamzoor* or encountered severe abdominal pains when they tried to hold the child. In two of those three cases, the mothers persevered and switched the baby from the bottle onto the breast within the first month. In Soraya's case, as we saw, it was because her daughter preferred the bottle. In the fifth case, it was the mother's fourth child, her second son after two daughters. She had successfully breastfed the older children, but her baby son's suckling caused her excruciating pain in the nipple. In her regrets that 'I tried, but sadly I couldn't breastfeed him, even though he is only my second son' is a suggestion that she might not have persevered so hard if he had been a girl.

Half the mothers breastfed immediately after birth, a higher prevalence of colostrum feeding than what is shown for Punjab by the National Nutrition Survey (Government of Pakistan, 2011) and the Demographic and Health Survey (Measure DHS, 2013). The other half the mothers did not feed their newborns breastmilk until the third day. In contrast with Mull (1991; 1992), Fikree *et al*. (2005) and the other qualitative studies discussed in the introduction, this was not because of mothers' expressed beliefs about the foul, unclean or polluted quality of *bauli* (colostrum). They described *bauli* as *pila dudh* (yellow milk) and recognized that, as one mother in Lahore recounted,

> The older women in the family, they do say that the *bauli* milk is *gundi cheez*, a dirty thing, it isn't right for babies and you should not give it. But nowadays doctors will tell you to feed breastmilk to the newborn babies from the very beginning.

Many of the mothers echoed word-for-word the notion that the first milk is like a vaccination for newborns, the very phrase used in the LHWs training manual (UNICEF/*Mehekma-e-Sehat*, 2010, p.28). '*Bauli* milk is very good for newborn babies' health, it is like a *hifaazti teeka* (vaccination) for the baby', said a mother in the first village. 'They say that colostrum makes the baby healthy and strong, I gave it to all my children', said another. This idea was thus widely repeated by mothers. Yet, only half of the women we interviewed had actually breastfed their babies during the first three days. The reason they cited, sometimes with a baffled expression, was because '*dudh tha bhi nahi*, there was no milk there, so how could I feed it'. This is perhaps a conclusion that women draw from their own experience of their lactating bodies (see Saha, this issue, p.TBC, on Indian colonial literature debating whether milk is present in the breasts after childbirth, and some medical practitioners' conviction that both the child and the mother were 'irritated by empty breastfeeding'). In these mothers' experience, their breastmilk only arrived on the third day when '*dudh bhari ho jata hai*, the breasts become heavy' aided by the consumption of heating postpartum foods such as *yakhni* (a meat stock) and *pinjiri* (a sweetmeat packed with dried nuts). Amongst those who had

breastfed immediately after delivery, there were some who described having done it almost experimentally. ‘I tried to feed him and the milk *was* there, so then I kept on feeding him’, said a mother in the first village. ‘You know mother’s milk starts coming only two or three days after the delivery, but we started feeding her earlier’, said a grandmother in the second village. In consultations with new mothers, the community health workers accepted women’s diagnosis that there was no milk until the third day. For example, in an interview with Parveen, a mother from the Christian colony in the first village, a community midwife was present. We asked Parveen about the initial breastfeed. She said she had started breastfeeding on the third day. When we asked what she had fed her son before then, the midwife interrupted and said that ‘before then you don’t have any milk, so what are you supposed to feed?’. Afterwards, we asked the midwife what she had meant about there being no milk; what about colostrum? She replied ‘that’s just between educated people like you and me. That’s not what we talk about with women like her’. This is perhaps the case, but equally, perhaps the biomedical dogma about colostrum did not resonate with her.

All but one of the mothers reported giving their babies a *ghutti* (prelacteal feed) in the first few days, most often a spoonful of honey or sugar. It was described as a welcome or a blessing for the child and not as a purge for the stomach. To clean the baby’s stomach women gave *chu-arqa*, a transparent liquid available in neighbourhood grocery stores or kiosks which is a mixture of four herbal extracts, and a homemade infusion made from seeds of the *ambaltas* (golden shower) tree. In the cases where mothers did not give breastmilk until two or three days after the birth, the wealthier families gave formula milk whilst the less wealthy gave *chu-arqa*, in larger quantities than as a purgative, to fill the baby’s stomach. The community health workers told us that there was no need to purge the abdomen, but were quite unconcerned with the practice of giving *ghutti*. Indeed, one of the midwives who had recently had a baby also told us about feeding her *ghutti*.

A common problem resulting in the feeding of something other than breastmilk in the first weeks after the birth was insatiable crying by the baby. When all attempts at soothing the baby’s stomach by massage and by eliminating gassy foods from the mothers’ diet did not pacify the baby,

mothers and grandmothers interpreted this crying as a sign of milk insufficiency. Another problem reported was when the baby spontaneously stopped drinking breastmilk. These conditions resulted in supplementation by alternative milks, most frequently formula milk in wealthy households and buffalo or cow milk in poorer households. Women reported that the doctors in the clinics and hospitals where they delivered the babies recommended brands of formula milk and sometimes also gave them a box to take home. In the case of one family in the first village, who had their own cows, the mother told us that a doctor at a clinic had told her to supplement her breastmilk with cows' milk because '*Lactogen 1 theek hai*, *lekin apni gai hai to us ka dudh pilain*, formula milk is fine but if you have a cow yourself, then you should feed him its milk'. This suggests a valuation of dairy milk for its strength and nutritive qualities and also its freshness, in comparison with dried powdered milk. Mothers also told us about the problems of dried milks, that it was 'heavy' for babies' stomachs, made their stomachs go bad or made them constipated, or caused them to *phool jana* (put on a watery weight that was not real health). In cases of milk insufficiency or of the baby suddenly refusing the breast, the most common explanation that women offered was that a jealous family member or neighbour had cast *nazar* (the evil eye) and dried up their milk or turned the baby against its mother's breast. The health workers, meanwhile, were quick to link these problems to maternal depletion. '*Agar tum kuch khati peeti nahi ho to tum dudh kaise banaogi*, if you don't eat or drink anything yourself then how are you going to make milk', admonished a *dai* in the second village during a consultation with a new mother who had been giving her baby formula milk to stop her insatiable crying. There were *totke* (home remedies/methods) to increase milk supply. These involved eating more in general, and also consuming galactogogues, such as drinking more milk or *lassi* (buttermilk) – milk being the superfood of the lactating mother; cumin; and foods with a heating *taseer*, such as butter, egg, chicken, *kaleji* (liver) and *pipra* (lung). The health workers also recommended women to drink more milk and eat these foods, encouraging them not to supplement with other milks until they had tried these *totke* but accepting that there were limits to what mothers could sustain. 'Many mothers are too tired to breastfeed', observed one of the midwives.

Frequent feeding by breast and other milks was held to produce a *sehatmand* baby, and women had the conviction that a weak newborn would normally recover and grow to a normal rate within the *chilla* (40 days postpartum). '*Agar dudh peeyega to us ki sehat khud ba khud theek ho jayegi*, as long as he drinks milk then his weight will recover'. With regard to producing a *sehatmand* baby, it is noteworthy that massage was mentioned a significant form of nourishment too. Mothers and grandmothers told us that a weak baby should be massaged with ghee infused with the essence of almond – a very heating substance – or in one case wheat grains, and that this causes weight gain as the oils are absorbed by the body (see also Reissland and Burghart, 1987). One grandmother told us that the mother should massage her own head with this almondy ghee too, because she would get *taaqat* (strength) from it. This was then a nutritive practice in its own right.

Failure to thrive

If a newborn failed to thrive, the mother's milk came under suspicion. The first port of advice in such cases were the grandmothers, who were concerned with whether the mother's milk 'suited' the child or not, and whether their milk might be *kaura* (bitter) or even *zehrila* (poisonous). There was a widespread domestic *totka* (home remedy/method) to test the quality of the mother's milk. This involved asking the mother to express a small amount of breastmilk onto the floor and then taking an ant and placing it in the pool of milk. If the ant crossed the milk, it was fine, but if it died, it was *kaura* or *zehrila*. In one case, a mother in the second village was taken by her mother-in-law for the kind of formal 'pseudoscientific' breastmilk testing that Mull (1992) documents in Karachi. We were unable to ascertain what the laboratory technicians at the hospital had tested the milk for. For the family, the important thing was simply that it had proved that 'there weren't any problems with her milk'. Whilst Balsamo *et al. (1992)* describe doctors in Italian hospitals in the 1980s routinely sending mother's milk for nutritional analysis, the sample reports that Mull offers in her paper tested for the presence of 'blood', 'pus' - perhaps fat droplets or white blood cells, both normal in breastmilk – and 'germs', perhaps from a contaminated test-tube (p.1286-7). A more fulsome study of this

phenomenon is needed, perhaps alongside consideration of postcolonial theory on mimesis enacting ‘a parody of the original’, whilst also engaging ‘legitimating signs’ (Langford, 1999, p.33).

As well as testing whether a woman’s breastmilk was *zehrila* or *kaura*, we also heard from four women that a biomedically-trained doctor had instructed them to cease breastfeeding because their milk did not ‘suit’ the baby. It seems that a number of health practitioners share the ethnomedical etiologies doubting the quality of mother’s milk. One of the Lady Health Visitors in the second village was scathingly critical, however. She drew on her own personal experience:

> I’ll give you my own example. I had lots of milk when my older daughter was born, it runs in the family, so did my sisters and so did my mother. But with the second one, because she was delivered by caesarean section, they stitched me up all wrong. My gut was connected to the uterus, it was very painful. I was in hospital for 20 days and on medication. That medication made my milk deplete. My daughter was very healthy when she was born, but because of the medication, she started to get *kamzoor*.
>
> My mother-in-law and my husband’s sister were talking amongst themselves about testing my milk. They are from a village too. I told them ‘an ant will die if we put it in water or in a buffalo’s milk, so why shouldn’t it die in my milk too. So will we die if we are drowned in liquid!’. They were shocked to hear me talking like that!

Another situation in which women might stop breastfeeding is if their weak newborn is diagnosed as having a *parchawan*, the Punjabi word for shadow or spirit. Some of the women said that *parchawan* could be caught from the wind or from walking beneath trees – like *jinn*, the race of beings made of smokeless fire, whose existence is mentioned in the Quran – whereas others said that a *parchawan* was cast by another woman or another child. This might be involuntary, through carelessness, or also a deliberate act of malice, as when a woman who is infertile or suffering *athra* – a spiritual illness characterized by repeated miscarriages or child deaths – tries to rid themselves of

their her own *parchawan* by passing it onto someone else. If a baby was born very *kamzoor*, it could indicate that a *parchawan* had fallen upon the mother whilst the baby was in her womb. If a baby was born *kamzoor* and then failed to recover its weight despite being breastfed frequently and kept safe from cold, that too could indicate the presence of a *parchawan*. In a final permutation, a baby born with a healthy weight could become *kamzoor* because of a *parchawan* cast upon him during the *chilla* (40 days postpartum, when both babies and mothers are permeable and vulnerable to the effects of spirits). In such an event, it might be suspected that the mother's milk itself was making the baby *kamzoor* and she would be instructed to cease breastfeeding the child.

There was a range of home remedies/methods to diagnose and counteract *parchawan*. These were extremely varied, reflecting differences of family tradition and the diverse migratory paths of the families who lived in the urban community. A rural-origin Muslim woman in Lahore described how one of her cousins in the village had been born extremely *kamzoor* and how his mother had taken a pumpkin and performed *dam-phook*, breathed words of scripture over the baby and the pumpkin, and then tied the pumpkin over his bed. '*Jaise jaise kuddoo sukhre ga vese vese bachha phul jaye ga*, as the pumpkin dries out the baby will fill out'. An aubergine could be used instead of the pumpkin. She told us another *totka* from her village, which was to place the baby in one side of a balance-beam scale, and place leather shoes in the other. Another method was to take the milk of a goat and put that in the nose of the child. Interestingly, these home methods resemble those recorded by Mull (1991) for the dreaded child disease *sukhey ki bimari*, the disease of dryness and thinness, which she discusses as a local diagnosis of marasmus. Mull documents similar interpretations of these healing rituals. In the case of the aubergine or the pumpkin, Mull says that as the vegetables dried up, their water was 'supposed to pass into the child' (p.180), suggesting a folk recognition of an association with dehydration. In the case of weighing of the child against leather shoes, '*jinn* are thought to be afraid of shoe leather, hence *taveez* are often encased in black leather for protection' (*ibid*.). In a more recent study, Qamar (2015) analyses the 'blessed vegetables ritual' in detail through classic Frazerian (1971) concepts of sympathetic magic.

Other home methods were invoked by a rural-origin Christian woman in Lahore, who told us about how one of her brothers had been born very *kamzoor* and how her mother had taken him to a shrine to consult there with an *alim*. The *alim* had performed a similar healing ritual with a pumpkin, but her brother did not recover in weight. Her mother therefore followed other method suggested by the *alim*, such as taking her son to another shrine and washing him in a muddy puddle at the shrine, leaving his dirty clothing there and putting him in new clothes to go home. A third method recalled by our informant was that her mother had caught live houseflies and fed them to her brother, a ritual mentioned by Mull meaning that the child 'had *sukhay ki bimari* but it also brought about a cure' (p.180). Our informant expressed ambivalence about these methods. She scoffed that

> How is that pumpkin going to have any effect on the baby? They say that if you hang it above the baby then it will dry up and the baby will grow. But if you take just an ordinary pumpkin and hang it in the top of the house, in the wind and the heat it will dry up.

But at the same time, she endorsed the idea that *parchawan* were distinct from illness.

> There was no point in taking my brother to a doctor because a doctor wouldn't be able to cure him. It wasn't an illness that he had, but a *parchawan*. My mother tried so many different *totke* to cure him but he just wouldn't put on weight. It was perhaps two or three years before he recovered his weight and we never knew which one of those *totke* had worked.

Some of the health workers, particularly the Lady Health Visitors, were vociferous in denouncing beliefs about *parchawan* as a dangerous etiology that might lead the mother and the baby down a slippery slope of *totke* that would weaken the baby further. Salma lectured,

> The problem is usually that a woman is anaemic and ill during pregnancy. She has a weak baby and then she doesn't make enough breastmilk. And then the old women in the house say that 'your milk is making the baby *kamzoor*' and they stop her from feeding her own milk. So then the baby gets even more *kamzoor*.

Yet we observed the Lady Health Workers and others quietly overlooking this part of women's health narratives, not challenging them or simply offering education messages about breastfeeding for healthy infant growth and antibiotics in case of illness. Some health workers seemed to genuinely appreciate the possible reality of spiritual affliction. For example, we discussed *athra*, the spiritual illness mentioned above, with midwife Samia and another Lady Health Visitor at the Basic Health Unit in the first village. Samia offered the observation that 'if the mother has *athra* her babies will turn blue and yellow after they die'. The Lady Health Visitor challenged Samia and said 'that's not *athra*, that's birth asphyxia'. Samia knew about birth asphyxia, but insisted 'no, you're saying it's like a *dam-ghutta* (suffocated) baby but it's not that, it's something different. After the baby dies, then it turns blue and yellow and that's how you know that the mother has *athra*'. Her views were therefore not very different from those of the women she worked with.

Discussion

The women in our study interpreted low birthweight first and foremost as the product of maternal depletion. They have a folk version of Ramalingaswami *et al*.'s 'Asian enigma', and understand low birthweight in terms of their powerlessness. Our findings indicate intriguing departures here with Dorothy Mull's (1991) work on marasmus or *sukhay ki bimari* in the Karachi slums, which we mentioned above. In Mull's study, only three of her 150 informants saw any link between marasmus and lack of food or diarrhoea. Rather, the mediation of a *saya* (spirit/shadow) was cited as the primary cause of the condition. In our study, by contrast, the effects of a *parchawan* (spirit/shadow) were suspected not only if a baby was born very *kamzoor*, but also if it failed to recover through

normal domestic management. Women distinguished between weak newborns who had a *parchawan*, and weak newborns who were *vese kamzoor* (weak for other reasons).

Our participants did connect weakness in a newborn to a want of food. As a result, they attempted to cure the infant by feeding them more frequently, massaging them and keeping them warm. We did not yet observe macro patterns distinguishing between the efforts made to nourish and care for girls and boys, but there are hints of differential treatment, which would be expected from the literature (e.g. Winkvist and Akhtar, 2000). Further study is needed on manifestations of son preference. In keeping with Mull (1992), we saw that breastfeeding was a precarious process for many women. It did not necessarily kick-in automatically, but could be threatened by caesarean sections or by insufficient priming of the postpartum maternal body with heating foods and galactogogues. Many found their babies crying insatiably and understood themselves to be making insufficient milk. Formula milk was frequently drawn upon in wealthier households and it was also recommended by some health professionals who attended deliveries. In poorer households, mothers supplemented their breastmilk with cow or buffalo milk, as it was already available in the household without incurring further costs. In a context where fresh dairy milk is valued, this was sometimes recommended by health professionals too. Women doubted not only the quantity, but also the quality of their milk. It is disturbing that many biomedically-trained professionals, as well as what Mull calls 'pseudoscientific' practitioners, compound women's insecurity about their milk and discourage them from breastfeeding. Further study is needed on 'pseudoscientific' breastmilk testing, as well as to understand the circumstances, local diagnostic categories and therapeutic recourse that lead some women to cease breastfeeding their babies altogether.

According to our findings, low birthweight is not an informational problem. It is a problem of poverty and gender inequalities within households and extended families. We found that community health workers are shoring women up in their search for recognition in their marital homes, encouraging women's mothers-in-law and sisters-in-law to care for them, give them respite, nourish them well and, where possible, give them something for *taaqat* (strength). They recognize that

breastfeeding is taxing and that mothers are frequently already depleted. They are working carefully to translate the universal messages of modern nutritional science into the impoverished contexts in which they work, as when they recommend women to double their consumption of chapatti even if they cannot afford meat, fruit and milk. This contrasts dramatically with the advice that Gillespie, in this issue, documents from community health workers in Highland Peru, who 'fail to recognize that diet is shaped by scarcity rather than ignorance or tradition' (p.TBC).

Community health workers have been telling mothers that colostrum is like a vaccination for the baby, and some are forthright and opinionated in countering what they identify as dangerous ethnomedical etiologies about spiritual affliction. Yet very frequently, we saw that the services provided by community health workers are integrative of local ethnomedical knowledge. Mull (1992) noted this very critically in the context of breastmilk testing, and Varley (2007) is also critical of biomedically-trained practitioners' diagnoses of milk insufficiency in northern Pakistan (p.196). But equally, comparing our findings with other examples of reproductive governmentality, such as that offered by Gillespie in this issue, we ought to appreciate the social closeness between health workers and their communities, which is clearly a very important part of the sensitive rapport they are able to build with the women they are intended to serve. Their work in cultural translation reflects, as Stacey Pigg (2001) put it in the context of local health workers in Nepal, not 'different knowledge systems bumping into each other, or supplanting one another' – as envisaged by the authors of LHW training manuals – but the 'already syncretic, hybrid, polyglot conditions with which most people contend' (p.483). Recalling LHW Shazia's comment that 'women only let us into their houses when we have free medicines to offer them from the government', Pakistan's maternal and child health services seem to be threatened more by chronic under-resourcing than by practitioners' lack of modern knowledge or skills, although this continues to be emphasized in health policies (see e.g. Atwood, Fullerton et al., 2010). In the meanwhile, where there is no weighing scale, the management of newborn nourishment and care is governed by the everyday space of what has long been transmitted across generations of kin – including in the health workers' own families.

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Wednesday 29th June 2016

Dear Editors,

We are extremely grateful to the peer reviewers for their searching critical comments on the previous draft. Their comments were profound, and we have completely rewritten the findings sections drawing from our recent and ongoing ethnographic study in Pakistani Punjab, rather than the cross-country data from focus groups on which we drew on in the previous draft. This means that our manuscript now focuses very tightly on Punjab, rather than speculating about the differences between provinces - speculations which reviewer 2 was in any case critical of. In so doing we are able to provide a differentiated analysis of the situation in Punjab, allowing us to draw out the different layers of analysis that reviewer 2 pointed us towards. The ethnographic data has the other important virtue of being able to illustrate what community health workers actually do and say in their interactions with women clients, rather than relying on what they say they do in interviews.

Our detailed revisions are as follows:

Reviewer 1 gave no critical comments or questions; we thank the reviewer for their supportive read.

Reviewer 2 gave incredibly constructive criticisms; we are deeply indebted to him/her.

1. The article's latter half in particular, the article's proposed, interwoven focus on newborn nourishment is neglected in favour of a focus on the cultural practices associated with newborn care.
   This is no longer the case. In the previous submission, there were three pages (p.13-16 of the previous draft) of descriptions of birthing and postnatal bathing and cord-cutting practices, which are no longer here. As a result, we focus much more tightly on newborn nourishment.

2. The article to ultimately provide a more general – and sometimes too generalized – overview of the many dynamic, diverse and complex practices that constitute maternal and newborn care practices across Pakistan. This reviewer asks the author/s to consider speaking more directly to the ways that health practices and indicators are contingent on local culture contexts, medical resources and political systems. For example, how are care practices and health outcomes influenced by the role played by class, ethnicity or sect, and the intersection of these same factors with localized beliefs, healing traditions and spiritual therapies?
   This was a searing comment that led us to completely re-think the paper and attempt to engage with our newer ethnographic materials rather than those of the older, focus-group based study. The re-draft is focussed tightly on the situation in the two field sites in Punjab, one rural and one urban, which allows us to consider how local health practices are embedded within culture, medical resources, socio-economic and political hierarchies. For example, in our introduction to our field sites on p.8-10 we explain the wealth stratifications in the rural and urban sites and the subjugation of minority Christian families and households vis a vis their Muslim majority

neighbours. Our findings, p.10-22, nonetheless demonstrate that there are greater differences across wealth strata than between the two religious communities. We also explain the differential recourse that different biradaris have to the community health workers and resources accessed through them, depending on whether the health worker is from their own biradari.

3. What of the comparative robustness or weakness of local, regional and provincial health systems and community health worker networks, and the consequent impacts of health systems on patient populations and health indicators?
   Because of this searching comment, we have completely rewritten the introductory section on maternal and child health workers, see p.5-7, so as to lay out very clearly the limited functionality of these programs; e.g. the LHW programme, although offering some benefits, is marred by the irregular provision of drug supplies, delayed disbursement of remuneration and poor district health system referral support; the TBA programme is marred by inconsistency; and the community midwives programme is marred by inequities in its roll-out which concentrate them in areas where they enter competition with many other public and private providers.

4. More emphasis could have been paid to national-level surveys, such as the 2011 National Nutrition Survey (https://www.humanitarianresponse.info/system/files/documents/files/59_National%20Nutrition%20Survey-2011.pdf), and organizational reports concerned with maternal health and childbirth practices, neonatal and infant malnutrition, and the Lady Health Worker Programme.
   We have drawn more from the National Nutrition Survey, referring to not only its data on maternal undernutrition, as in the previous draft, but now also referring to its data on breastfeeding colostrum, see p.3-4. We have also drawn on organizational reports concerned with the LHW programme, e.g. Hafeez et al. 2011 and Khan 2011.

5. The author/s infer that mothers are primarily responsible to recognize and act on neonatal 'weakness' and malnutrition, which is problematic inasmuch as poorer women are often poorly positioned to socially and economically act on their concerns for their infants. For this reason, analysis of the contribution of gender inequality, inequity and constraints on women's health-decision making agency and social mobility, especially as it relates to issues of health and service use, could enrich the author/s' analysis.
   This was a very valuable suggestion. We have now built in an explicit discussion of women's health-seeking and its dependence on the cooperation of family members, using Mumtaz and Salway 2006 and 2009, see discussions on p.4. In the findings we have also highlighted the relational aspects of the treatment of pregnant women and their babies, see p.10-13.

6. With regard to their analysis of the newborn's spiritual and social status, the author/s are cautioned that liminality (vulnerability, weakness) and impurity are not analogous; in many instances, while active dietary and ritual efforts are undertaken to rid infants of the impurities of its mother's body and the childbirth process in particular, this does not mean that infants in and of themselves are considered to be 'impure' (*na pak*).
   We thank the reviewer for this observation. This comment is no longer relevant, in the revised paper, because we have taken out the aforementioned discussion of birthing practices.

7. The author/s' descriptions of spiritual healing techniques also require further contextualization and analysis.
   The spiritual healing techniques discussed in the previous draft are retained in the new version, see p.18-22. We have provided further contextualization and analysis by drawing from Dorothy Mull's 1991 study of sukhay ki bimari and from Qamar 2015 on sokhra in Punjab.

8. Are any study-specific or national statistics available which help confirm the study's observations, or confirm the significance of LHWs' outreach across the four provinces?)
   As it is no longer a cross-province study, this comment is no longer relevant.

9. More might be said regarding the deleterious effects of interwoven vertical campaigns, such as when LHWs are tasked with participating in regular polio eradication campaigns, for the success of national and provincial nutritional interventions and community-based strategies.
   In our ethnographic study we have not yet encountered rumours about polio eradication as a veil for western conspiracies, unlike the comments we documented in the previous draft to be common in KP and Balochistan. As a result, we have taken out much of the discussion of the political controversies over the polio campaign. But, following the new thread of our discussion of the LHW programme we have retained the description of the deleterious effects of interwoven vertical campaigns, as it demonstrates the over-burden on the LHWs as well as the ways in which health policy makers have delegated more and more tasks to them simply because they are so extensive within Pakistan and are supposed to have good access in their communities, p.6-7.

10. For this reason, a concise introduction to the politics of (mis)trust bound up with state-provided care, and the interventions provided by international agencies like Save the Children, would be welcomed.
    This is no longer relevant, see our response to point 9 above. But this is a point well taken!

11. The article could also be strengthened if the author/s took care to clearly introduce their study's rationale.
    The methodological points raised by the reviewer are no longer relevant as we are not drawing on those focus group materials. However, we have taken up their instruction to clearly introduce the study and its rationale by giving a detailed description of the wider research aims, as well as why we end up focussing on nourishment in the immediate postpartum, see p.8.

12. The author/s may also wish to include a footnote that explicitly details the ethics review process, and the strategies adopted by the study and/or investigators to reduce ethical risks or challenges. For instance, during active studies of acute malnutrition, investigators are not distant from their participants and may be expected in certain instances to intervene and avert the possibility of acute neonatal harm or imminent death (see Scheper-Hughes).
    We have added a paragraph on research ethics, p.9-10, drawing on Scheper-Hughes, and thank the reviewer for this very useful suggestion.

13. What more could be said regarding the districts in which the study took place, and the mothers, family members and healthcare providers who inhabit it?
    We have provided an introduction to the ethnographic setting on p.8-9 and this gives a vivid introduction to the household context of the mothers, their family members and the healthcare providers who populate the villages and the urban site.

14. What of the functionality and outreach of existing allopathic healthcare systems?
    This has been incorporated into the introduction to the ethnographic setting on p.8-9.

15. Could the author/s clarify what constitutes 'pseudoscientific''?
    This term comes from Dorothy Mull 1992. We have given a full gloss of what she means by this term on p.5 and p.18-19.

16. To what degree were the medical services provided by physicians and LHWs integrative of ethno-medical etiologies, diagnostic categories and therapeutic recourse (such as is suggested by the physician's remark that jaundice could be 'spread' via breast-milk)?
This is centred up-front in the new version of the paper, mentioned in the abstract on p.1, in the introduction to the LHWs programme on p.6 and throughout the ethnography on p.10-22. It is also discussed very centrally in the discussion/conclusion on p.24, referring to Pigg 2001.

17. In which ways have the state, transnational and national organizations and/or NGOs been present (or absent), and what role have they played in improving (or worsening) local nutritional practices and food security?
In the introduction to Pakistan's community maternal and child health workers on p.5-7 we have explicitly discussed the dovetailing roles of the state and the transnational public health apparatus in setting up these schemes, and in the introduction to the field site on p.9 we explain that the villages are served by a national NGO, initially with German government funding. We have explicitly problematized the 'on-off' nature of this support on p.7.

18. In this reviewer's opinion, one glaring analytical omission concerns the role played by infants' gender in determining their nutritional intake, the care provided to them, and the probability of medical or ethnomedical recourse should 'weakness' or illness occur.
We are grateful to the reviewer for pointing us in this direction. We have given ethnographic examples of differentiated care to the pregnant mother depending on the sex of the fetus on p.13, and of nutritional care to the baby on p.14, and returned to this issue in the discussion/conclusion on p.23 saying that there's a need for more research on this issue.

19. Finally, the article would be improved if the author/s were able to provide a succinct set of recommendations suitable for organizations and agencies working across Pakistan.
As this research is not designed to evaluate Pakistan's community maternal and child health programmes exhaustively, it would not be suitable to offer recommendations at this stage. However what we can say, on the basis of our study to date, is that 'Pakistan's maternal and child health services seem to be threatened more by chronic under-resourcing than by practitioners' lack of modern knowledge or skills, although this continues to be emphasized in health policies', as we do on p.24, in one of the very last sentences in the paper.

We hope that the editors will consider us to have engaged very seriously with the reviewers' searching criticisms and that the revised draft is substantially improved as a result.

Yours sincerely,

Where there is no weighing scale: newborn nourishment and care in Pakistani Punjab

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Acknowledgements
This research was funded by the John Fell Foundation of the University of Oxford. We are extremely grateful to the anonymous NGO staff who initially introduced us to health workers in the two villages, and to Bibi Anwar in Lahore. Riffat Farooq, Asifa Parveen, Spenta Kakalia and Elizabeth Rahman offered formative comments on the direction of this research. Last of all, we are deeply grateful to the anonymous reviewers from *WSIF*, who encouraged us to delve deeper into our fieldnotes and hopefully, to improve this beyond measure.