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Dear Stephen,

Many thanks for your e-mails dated 7th and 15th November, 2016 asking the Maternity Network to look at correspondence received from Mr John Eldred and Councillor Rebecca Hanson.

A network group comprising Stephen Sturgiss, Anne Holt and Vicki Smith, supported by myself and Suzanne Thompson met recently to discuss the content of their correspondence, including the 3 papers referenced in the document from Mr Eldred. Subsequently we have also looked at a further article (Grzybowski et al, 2011) arising from details contained in the Australian meta-study (reference 2 in Councillor Hanson's paper).

During the course of our deliberations we felt it was not going to be appropriate to comment on the arithmetic calculations in the correspondence because we feel certain aspects of the evidence not mentioned lead us to consider that, on balance, there is not a strong enough link between travel times and outcomes.

The papers from Councillor Rebecca Hanson and John Eldred include a series of statements in relation to an increased incidence of adverse outcomes amongst women who live far away from consultant-led obstetric care.

In addition, a series of calculations have been used to describe a theoretical increase in the numbers of neonatal deaths if WCH were not to have 'obstetric services'. These calculations are based on the notion that 'for every 15 extra minutes women have to travel the neonatal mortality rate increases by 15%'.

We examined in detail the statements in Councillor Hanson's paper – and have analysed each comment in relation to the reference from which it has been taken. We also looked in particular at the '15 minute' statement – as this is the key assumption within the theoretical modelling (in relation to neonatal deaths). This statement needs to be statistically valid in order for the rest of the conclusions to be credible.

This analysis of the references is written in the order they appear in Councillor Hansen's document – and under the same sub-headings. The three papers referenced in John Eldred's correspondence are included.

What is happening in Europe?

The first publication referred to in the 'Key Findings' section of this paper is the 'Dutch study on travel time in labour' (page 2 – reference 3). In fact, the reference is to a review paper from the Public Health Wales Observatory (PHWO), in which there is a conclusion (page 4) that:

'This research evidence review did not find conclusive evidence to support a causal link between increasing distance, or the time, required to travel from mother's residence to maternity services and adverse birth outcomes. All the studies finding any evidence of such an association were limited by their inability to account for important contributory factors and confounders (e.g. referral to specialist maternity units) and their reliance on a number of unsupported assumptions (e.g. women are at home at the onset of labour).'

This PHWO review paper refers to the findings of the 'Dutch study' (on page 10), but as we've already mentioned in a previous email (and as acknowledged in other papers on the subject), the Dutch system of maternity care involves women staying at home until they are confirmed to be in labour. This is not a feature of the UK (or other) system(s) of maternity care, in which women present to hospital when they suspect that they might be in labour

Neonatal deaths: an extra 1.4 each year

The paper from Councillor Hanson refers to page 43 of an 'Australian meta-study', from which it appears that the Councillor has taken the statement that 'for every 15 extra minutes women have to travel the neonatal mortality rate increases by 15%'.
This paper is another review of the subject, and includes the following statements in their conclusions about the association between distance to care and outcomes:

'Distance to Care: Key Points

- 1. For BC women, neonatal mortality is three times more likely for births in which the women had to travel four or more hours to services;*
- 2. For BC women who have to travel more than 1 hour, induction is 1.3 times more likely due to travel logistics;*
- 3. International evidence shows that increasing numbers of women travelling longer distances to care is creating greater resource usage to compensate for greater rates of morbidity;*
- 4. An unequivocal relationship exists between distance and outcomes: as distance goes up, so do negative outcomes.'*

This meta-review draws these conclusions from several publications, relatively few of which have analysed the numbers of stillbirths and / or neonatal mortality in relation to distance from place of birth and / or the nearest maternity unit. The findings from each of the studies looking at perinatal mortality rates are summarised below:

Gryzbowski et al (2011)

This is a study of pregnancy outcomes for women carrying a singleton baby in rural Canada. The authors noted that:

'For those few women who had to travel the longest distance (greater than 4 hours to care), neonatal mortality was three times more likely (OR=3.17, 95% CI 1.45-6.95) (Grzybowki, Stoll and Kornelsen 2011)'

However, the study group also found that the perinatal mortality rates for women living either 60-120 minutes or 120-240 minutes from a specialist centre (5 and 6 per 1000 births, respectively) were very similar to those for women living within an hour of specialist services (6 per 1000). Hence, the findings from this study do not support the argument that the proposed reconfiguration of services in Cumbria would be associated with a greater number of perinatal deaths.

Paranjothy et al, 2014

It's certainly the case that this (Welsh) study showed a statistically significant increase in the risk of both early and late neonatal death with every 15-minute increase in travel time to the *place of birth*. This study appears to have been the source of the claim that that 'for every 15 extra minutes women have to travel the neonatal mortality rate increases by 15%'

The authors, however, suggested that this finding was unsurprising as the most vulnerable babies are likely to be transferred to the nearest tertiary centre. For example, a preterm neonate or a baby with a congenital anomaly at term will be transferred to a tertiary centre for birth.

Of interest, and in the same paper, there was no statistically significant association between intrapartum stillbirth, early or late NND and travel time to the *nearest hospital*. In fact, the odds ratios for such outcomes were very close to 1

The authors concluded that '*reconfiguration of maternity and neonatal services may have little impact on birth outcomes, provided there are appropriate neonatal transfer services in place*'

Combier et al, 2013

In a study from the Burgundy region of France, the authors reported that FHR abnormalities, meconium-staining of the amniotic fluid, hospitalisation of mothers, and out-of-hospital deliveries were significantly more common in mothers who lived further away from maternity units, but none of the women who lived more than 46 minutes away from the hospital gave birth out-of-hospital.

Stillbirths and perinatal deaths were more frequent in mothers with longer travel times, but the differences between the mothers living closest to and furthest away from the maternity units weren't statistically significant.

The author's acknowledge the contradictory findings in the evidence base – and (in fact) quoted 2 studies from Cumbria that apparently found no associations between perinatal mortality rates and travel time to the nearest maternity ward.

Pilkington et al, 2014

In another large study from France, longer distances to a maternity unit had no impact on stillbirths or neonatal deaths when adjusted for confounding variables such as social risk factors

There was a significant increase in the numbers of neonatal deaths in out-of-hospital births, but these were said to be very rare

Seriously ill babies

The statements in this section of the paper - relating to a potential increase in the numbers of babies admitted to neonatal intensive care - are taken from the article by Grzybowski et al (2011), in which the authors reported that:

'Newborns from catchments 2 to 4 hours, and 1 to 2 hours from services generated rates of 179 and 100 NICU 3 days per thousand births, respectively, compared to 42 days for newborns from catchments served by specialists'

The relevance of these findings, however, to the potential reconfiguration of services in Cumbria is questionable. The authors acknowledged difficulties in properly controlling for the potentially confounding effects of ethnicity and socio-economic status. Moreover, there are fundamental differences between the healthcare systems in Canada and those in the UK.

Better Births

It is noted that within Better Births (p90) a proactive approach to addressing issues relating to remoteness and rurality is offered.

'Remote and rural areas can introduce innovative working practices such as:

- Robust triage and transferring the care of women with more serious complications at an appropriate time in the pregnancy to a more specialised unit
- Defining which types of women should be advised to give birth at which units across the local maternity system
- Providing transport facilities for women needing to travel to more specialist units and enhanced transfer services for women or their babies experiencing unexpected serious complications
- Making use of technology, e.g., consultations by video link between the centre and smaller unit.'

Summary

Overall, we do not feel that there is sufficient evidence in the papers referenced to justify a conclusion that increased travel times to the nearest maternity unit (at less than 4 hours distance) are associated with an increased risk of either stillbirth and / or neonatal death. Hence, we could find no justification in the references contained within the paper from

Mr Eldred and Councillor Hanson for the theoretical modelling of increased neonatal mortality rates according to stepwise 15-minute increments in travel times to the nearest unit.

There is evidence within the references quoted that longer travel times might be associated with an increased incidence of interventions such as inductions of labour and / or hospitalisation, as might be expected when clinicians and parents might be taking decisions with the intention of minimising potential problems caused by longer travel times

The evidence that longer travel times might lead to an increase in the numbers of out-of-hospital births is consistent across several studies, and is plausible. It is, therefore, particularly reassuring that even if out-of-hospital births are more frequent, overall perinatal mortality rates in these studies – when controlled for confounding factors – aren't significantly affected by longer travel times (at < 4 hours from the nearest unit).

Detailed consideration of infrastructure issues such as transfer arrangements and accommodation near Cumberland Infirmary, Carlisle would help mitigate any potential increased risks.

Yours sincerely



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Associate Director

cc Stephen Sturgiss, NUTH
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