Sweden wins over England in child health championship

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Sweden lost its World Cup quarter final to England in summer 2018, but it has certainly met its goals for infant survival. Child mortality is almost twice as high in England as Sweden, according to a study by Zylbersztejn *et al*[1] that covered 2003–2012. This is a little difficult to understand given the many similarities between the two countries and the fact that Sweden essentially copied the model for the UK National Health Service. However, several reasons could explain the difference.

In the 18th and 19th centuries, Sweden was a poorer country than, for example, France and England, and it had very high infant mortality rates. In 1845 the Swedish government appointed Fredrik Theodor Berg (1806–1887) as the first professor of paediatrics in Sweden, and possibly the world, at the Karolinska Institutet in Stockholm. He stated prophetically that "the health of the nation is related to the survival of infants."

Crucial political reforms led to decreasing infant mortality in Sweden during the 20th century.[2] Antenatal and children's clinics were established and poor mothers could receive child benefits from the 1930s. Sweden's economy was boosted after the Second World War, partly because the country had remained neutral. The Swedish government also introduced social reforms and considerable improvements in housing for families with children. Most of the poverty and the small midwifery units like Nonnatus House in the British television series Call The Midwife disappeared in Sweden. Meanwhile, the UK was still recovering from the ravages of war, and about one-third of families with children were still very poor.[3]

Home births became nearly non-existent in Sweden; all deliveries took place at lying-in clinics with linked paediatric services and children's clinics opened all over the country. During the 1960s and 1970s, a lot of paediatricians were trained so that most children could have direct access to this specialism. Sweden's infant mortality rate became one of the lowest in the world, alongside Iceland, Finland, Japan and Singapore.

The Zylbersztejn *et al* study comprised nearly four million singleton births from England and just over one million births in Sweden, which represented about 65% and 99.8% of the live births, respectively, during the study period.[1] The highest mortality rates, and the main differences between England and Sweden, were at 2–27 days of age, when 77% of the excess risk of death in England seemed to be due to birth characteristics, and to a lesser extent to socioeconomic factors (3%). During the first year after the neonatal period, birth characteristics explained 68% of the difference, while socioeconomic factors explained 11%. The latest government mortality rates for England and Wales (2016) identified the main risks as socioeconomic factors, the mother's country of birth, the mother's age at delivery and the child's birth weight.[4]

The main difference in birth characteristics reported by Zylbersztejn *et al* was the higher prevalence of premature singleton births in England (5.5%) than in Sweden (3.6), defined as a birth weight below 2500 g, before 37 weeks of gestation or small for gestational age.

One important explanation could be that there were four times more teenage mothers in England than in Sweden, possibly due to a more liberal attitude to teenage abortions in Sweden, which provides special polyclinics for teenage terminations. Sexual education and information on contraception are also well organised in Sweden.

Furthermore, nearly all pregnant women in Sweden attend antenatal clinics run by midwives and gynaecologists. It is possible that patients with complicated pregnancies are identified earlier in Sweden and referred to specialist centres, and that the country has fewer organisational and professional boundaries than in England. This may particularly disadvantage women from ethnic minority groups, especially if they do not speak English. In Sweden the service of interpretation is well established for persons not speaking Swedish. The need to break down boundaries in England was identified by the National Maternity Review for England, published in February 2016. This contains wide-ranging proposals to make maternity care safer, reduce mortality, and give women greater control and more choice.[5]

Other factors identified by Zylbersztejn *et al*[1] were that smoking during pregnancy was much less common in Sweden than in England (6.5% vs 12%, 2010), although there are some worries that the popular use of oral tobacco, or snus, in Sweden may have similar negative effects. Obesity is also more common among pregnant women in England.

Deliveries remain very centralised in Sweden and most take place in hospitals with children's clinics. Women with challenging pregnancies, or those who could give birth to extremely preterm infants, are referred to university hospitals, where they can stay for long periods until delivery. Nearly all preterm infants born before the 28th gestational week are delivered at the eight university hospitals with neonatal intensive care units. It is possible that this centralisation has been better implicated in Sweden than in the UK.

Zylbersztejn *et al*[1] also reported that deaths due to congenital malformations were more common in England than Sweden (43 vs 29/100 000 singleton live births). This could partially be due to the higher smoking and obesity rates in England. The treatment of congenital malformations is more centralised in Sweden, with just two centres for paediatric cardiac surgery and four paediatric surgical clinics, which will be merged to two in a few years time.

More infants are breast fed in Sweden and all children attend special child healthcare centres several times during infancy and then at least once a year until school age, with reminders for parents and home visits from nurses if necessary. Expectant mothers also receive advice on a healthy lifestyle during pregnancy, on breast feeding and on safe sleeping positions for their new baby.[6] There is a strong historical tradition in Sweden that people trust and listen to the authorities.

Sweden lost out when it came to the World Cup, but it is still one of the leading countries when it comes to child health championships. However, there are some concerns that it may not be able to maintain that position. There is a shortage of paediatric nurses, and sick babies often have to be transported to other centres, sometimes even abroad. In addition, stillbirths seem to be higher in Sweden than other Nordic countries. Although the

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survival of extremely preterm infants is higher in Sweden than in England and Wales, the prevalence of severe disabilities among these infants appears to be similar[7] and about 20% develop autistic spectrum disorders.[8]

The reasons for child mortality are both complex and multifactorial, and Sweden clearly needs to keep its eye on the ball to achieve its goals and maintain its winning performance in this area.

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