

pregnancy. Furthermore, the incidence of microcephaly and brain lesions in fetuses developing in the presence of Zika virus in the amniotic fluid is not known.

In view of this uncertainty, it is highly questionable whether amniocentesis, which carries a 0.1–1% risk of miscarriage,<sup>2</sup> is at all useful in the asymptomatic fetus. A normal result might not bring reassurance, and the presence of Zika virus in the amniotic fluid might not necessarily be associated with fetal brain damage. Miscarriages related to amniocentesis and pregnancies' termination of asymptomatic fetuses might be much greater than the number of truly affected children. If counselled appropriately, many couples might decline the procedure, or at least wait until 21 weeks' gestation. Additionally, since asymptomatic blood donors can still be viraemic for Zika virus,<sup>5</sup> we also recommend transfusing pregnant women only with products tested negative for Zika virus when those are collected locally.

We declare no competing interests.

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## INTERGROWTH-21st very preterm size at birth reference charts

In 2014, the INTERGROWTH-21st Consortium published international standards for newborn baby size, based on neonates with no major complications or ultrasound evidence of fetal growth restriction (FGR), who were born to healthy mothers without FGR risk factors.<sup>1</sup> Despite our large sample size, very few neonates born at 33 weeks' gestation or earlier met these prescriptive inclusion criteria. While implementing these standards, we have received many requests for very preterm, size at birth charts for clinical practice and research.

Unsurprisingly, at these low gestational ages, most pregnancies have some risk factors, and prescriptive standards are difficult to construct. Therefore, we opted to generate very preterm reference charts to avoid previous methodological shortcomings.<sup>2</sup> We supplemented the original sample by including neonates from the same INTERGROWTH-21st population who, despite being born to mothers with some FGR risk factors (except smoking and severe obesity), did not have congenital malformations or ultrasound evidence of FGR before birth. We used the same statistical methods as for the Newborn Size Standards.<sup>1</sup> All other methods and ethics approvals have been described previously.<sup>3,4</sup>

408 neonates (214 boys, 194 girls) were included in the reference study population, after excluding 216 newborn babies because of maternal smoking, severe maternal obesity or morbidity, congenital

malformations, or ultrasound evidence of FGR, and 37 because of implausible anthropometric measurements or gestational age estimates. As expected, perinatal events (eg, higher pre-eclampsia, caesarean section, and neonatal mortality rates) for these very preterm babies differed from the Newborn Size Standards (appendix).<sup>1</sup>

The third, 10th, 50th, 90th, and 97th smoothed centile curves for weight, length, and head circumference at birth according to gestational age and sex, superimposed on the individual data, are shown in the appendix (actual centile values and corresponding equations are provided in the appendix and at the INTERGROWTH-21st website). Values for birthweight and head circumference at 33 weeks' gestation overlapped perfectly with the original Newborn Size Standards;<sup>1</sup> values for length were complementary at the median level, but less so at the extreme centiles because of the differently shaped curves in early and late pregnancy (figure).

We present very preterm reference charts for newborn baby size at birth using the same underlying population, methods, instruments, standardisation protocols, and statistical analyses as for the Newborn Size Standards,<sup>1</sup> which they complement well. They provide neonatologists with a single way to assess and screen newborn babies from 24 to 42 weeks' gestation. The head circumference charts are particularly important in view of the urgent need, in the midst of the Zika virus outbreak, to assess the head size of newborn babies with a set of standardised, gestational-age specific charts, to avoid over-reporting of cases of microcephaly across all affected regions.<sup>5</sup>

We thank the Bill & Melinda Gates Foundation for providing the INTERGROWTH-21st grant to the University of Oxford. We declare no competing interests.

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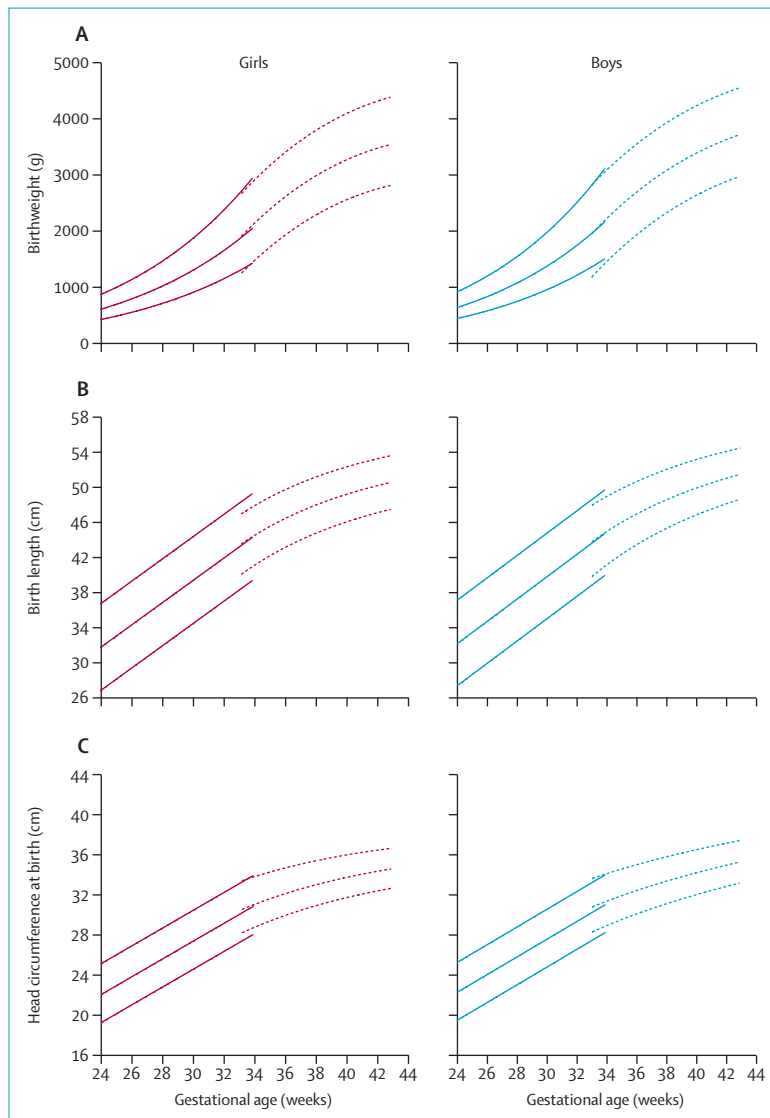


Published Online  
February 18, 2016

[http://dx.doi.org/10.1016/S0140-6736\(16\)00384-6](http://dx.doi.org/10.1016/S0140-6736(16)00384-6)

See Online for appendix

For more on INTERGROWTH-21st see <https://intergrowth21.tghn.org/>



**Figure: Centile curves for weight, length, and head circumference at birth**  
The 3rd, 50th and 97th centile curves for birthweight (A), birth length (B), and head circumference at birth (C) according to gestational age for newborns less than 33 weeks' gestation (solid lines) followed by the INTERGROWTH-21st Newborn Size Standards<sup>1</sup> (dashed lines).

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## The Hajj Health Requirements: time for a serious review?

More than 2 million Muslim pilgrims from around 180 countries congregate annually in Saudi Arabia for the Hajj religious mass gathering. This event can potentially affect global health security because of the possibility that infectious agents will spread beyond Saudi Arabia via returning pilgrims. The Hajj Health Requirements are a set of health conditions for individuals intending to do the Hajj pilgrimage aimed at preventing communicable diseases.<sup>1</sup> Historically, these illnesses were the largest cause of morbidity and mortality during the event, but non-communicable diseases are now the major burden. For instance, cardiovascular diseases now cause up to 64% of admissions to intensive care units and 46–66% of deaths among pilgrims during Hajj.<sup>2–4</sup>

Despite this shift in priority, the Hajj Health Requirements remain unchanged, focused only on communicable disease prevention with no measures to reduce the burden of non-communicable diseases. Pre-Hajj medical status and individual pilgrims' characteristics have a direct effect on morbidity, and both the pattern and outcome of hospital admission during Hajj.<sup>2,5</sup> Hence, we echo previous calls for pre-Hajj health screening for individuals<sup>2,4,5</sup> to select those deemed fit to undertake Hajj based on medically informed, evidence-based, and well formulated criteria. Such a health fitness test would screen pilgrims for risk factors, determine how well their chronic diseases are managed, and identify and exclude those with severe health conditions from undertaking the pilgrimage. Similar health screenings have been implemented in a number of countries, and have resulted in substantial reductions in rates of both hospital admission and mortality during Hajj.<sup>4,5</sup>