

# Which fetal biometry charts should be used? A large validation study in mainland China

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## Abstract

**Objective:** To assess the impact of applying published fetal growth references or standards in the Chinese mainland population and to compare their ability to predict newborns small- for- gestational- age (SGA). **Design:** Retrospective observational study. **Setting:** A tertiary hospital in Shenzhen, a Chinese city with the most immigrants. **Population:** All pregnant women (n=106,455) who booked for prenatal care with ultrasound measurements for fetal biometry between 2012 and 2019. **Methods:** A fractional polynomial regression model was applied to construct Shenzhen fetal growth chart ranges for HC, BPD, AC, and FL. The differences between Shenzhen charts and published charts were quantified by calculating the Z-score. **Main outcome measures:** The impact of applying these published charts was quantified by calculating the proportions of fetuses with biometric measurements below the 3rd centile of these charts. The sensitivity and area under the receiver operating curves of published charts to predict neonatal SGA (birthweight <10th centile) were assessed. **Results:** Following selection, 169,980 scans of fetal biometry contributed by 41,032 pregnancies with reliable gestational age were analyzed. When using Hadlock references (<3rd), the proportions of small heads and short femurs were as high as 8.9% and 6.6% in late gestation, respectively. The Intergrowth-21st standards matched those of our observed curves better than other charts. When using AC<10th centile, all of these references were poor at predicting neonatal SGA. **Conclusion:** Applying Hadlock references could possibly misclassify a large proportion of fetuses as SGA. Conversely, applying the Intergrowth-21st standard appears to be a safe option in mainland China.

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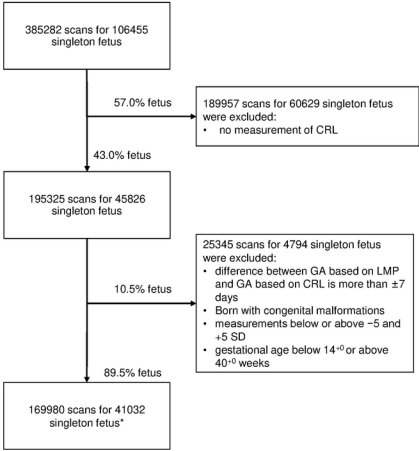


Figure 1

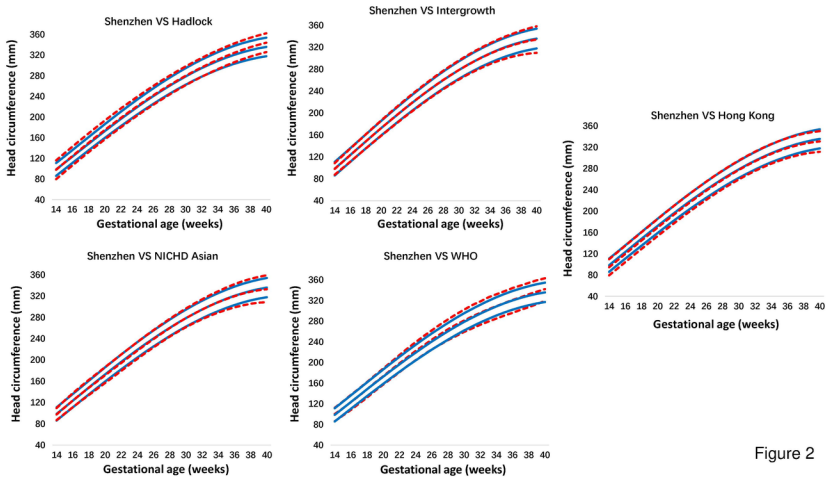


Figure 2

