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Abstracts

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Population-based vs customised fetal weight standards for the identification of maternal BMI-related stillbirth risk

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Objective: High maternal body mass index (BMI) is associated with increased stillbirth risk, yet it is also claimed to be protective of SGA.[1] We wanted to examine this association using population-based and customised charts for fetal growth used in the UK.

Method: The cohort consisted of 2,554,665 British-European pregnancies delivered in NHS hospitals from 2015 to 2025. Stillbirth rates (24+ weeks) and SGA rates (<10th centile) at birth were calculated in five maternal BMI groups. Population charts were the Fetal Medicine Foundation (FMF)[2] and the revised Intergrowth-21st (IG21)[3] standards. The Gestation Related Optimal Growth (GROW) standard[4] was customised for maternal height, weight, parity and ethnic origin. Trend of SGA rates were compared with stillbirth rates across the BMI groups using Clogg's Z test.

Results: The average stillbirth rate was 3.80 and had a U shaped distribution across the five BMI categories (Figure 1). SGA rates varied widely for the two population based charts (at BMI 18.5–25.0: FMF = 19.0, IG21 = 8.6%). Both population standards had a high SGA rate at low BMI, and a downward trend with increasing BMI, contrary to the stillbirth rate, which increased with obesity ($p < 0.05$). In contrast, SGA rates according to GROW followed the stillbirth rate across BMI groups.

Conclusion: Customised charts identify an association between increasing maternal BMI and risk of SGA associated stillbirth risk. Consistent with previous findings,[5] these population charts in current use hide the increased SGA rate in high BMI mothers, and therefore may miss growth restriction associated stillbirth risk.

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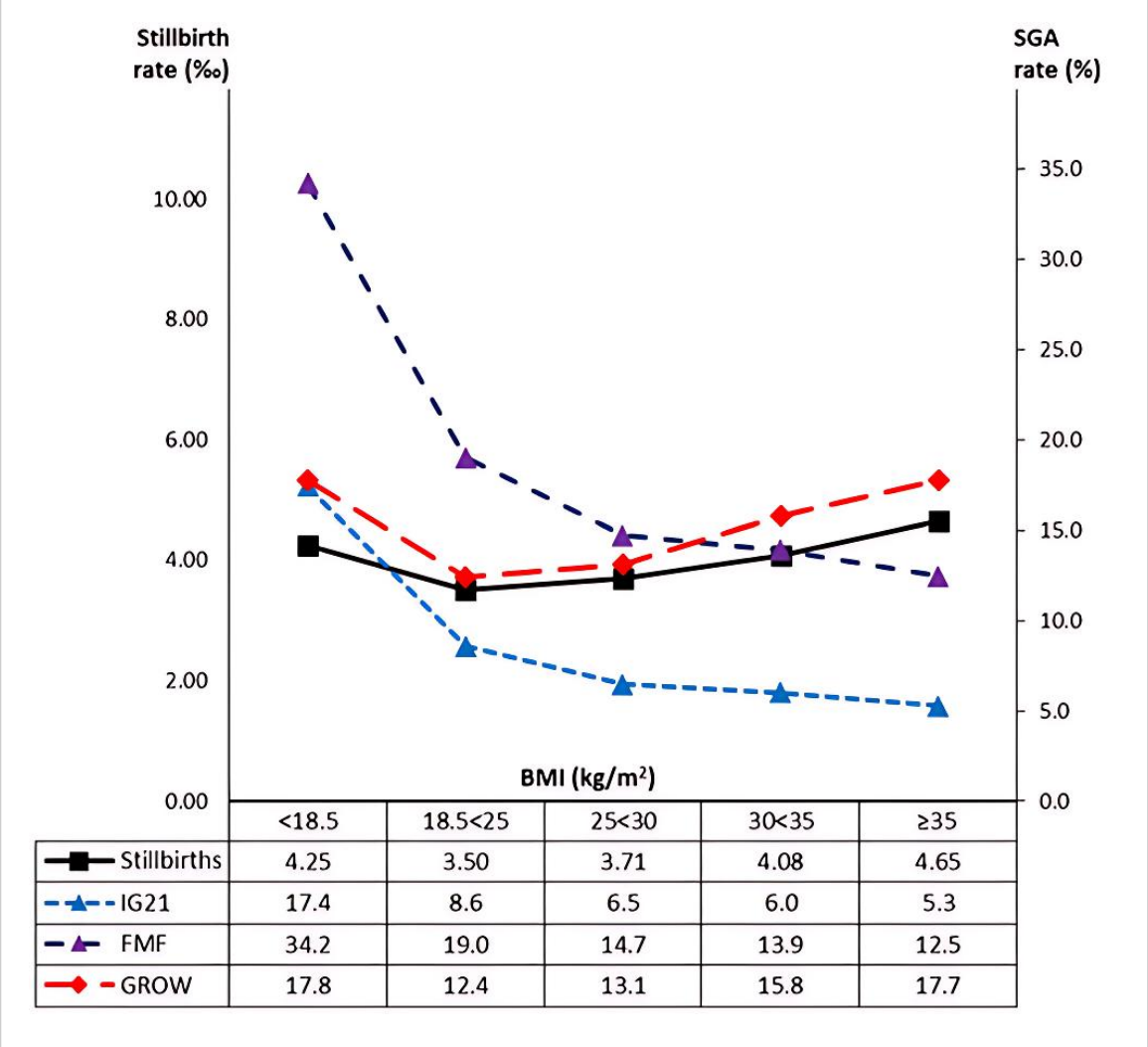

	<18.5	18.5<25	25<30	30<35	≥35
Stillbirths	4.25	3.50	3.71	4.08	4.65
IG21	17.4	8.6	6.5	6.0	5.3
FMF	34.2	19.0	14.7	13.9	12.5
GROW	17.8	12.4	13.1	15.8	17.7

Figure 1