

Late onset growth restriction preceding stillbirth in India: Hadlock vs GROW charts

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Objective

Appropriate growth charts are essential for fetal surveillance, to confirm that growth is proceeding normally and to identify pregnancies at risk. We compared the Hadlock fetal weight chart¹ and the GROW perinatal chart² (Fig 1) → in their ability to assess SGA related stillbirth risk in India.

1. Hadlock et al <https://doi.org/10.1148/radiology.181.1.1887021>
2. GROW Perinatal Chart. Perinatal Institute www.perinatal.org.uk/grow

Methods

- The cohort consisted of 67,808 births including 97 stillbirths, delivered from 32+ weeks in the Fernandez Hospital, a Tertiary Centre in Hyderabad, India, between 2015 and 2022.
- SGA was defined as less than 10th weight-for-gestational age centile at birth. For stillbirths we corrected gestational age by deducting 2 days as the estimated average 3rd trimester delay between fetal death and delivery.
- We applied two standards to determine SGA:
 1. the widely used Hadlock charts for ultrasound estimated fetal weight;
 2. the GROW fetal & neonatal standard, customised for ethnicity only, based on term birthweight from low risk, normal outcome Indian pregnancies, combined with a fetal proportionality curve (GROW-India).
- Relative risk (RR) and 95% confidence intervals (CI) were calculated to assess associations between SGA and stillbirth using the two standards.

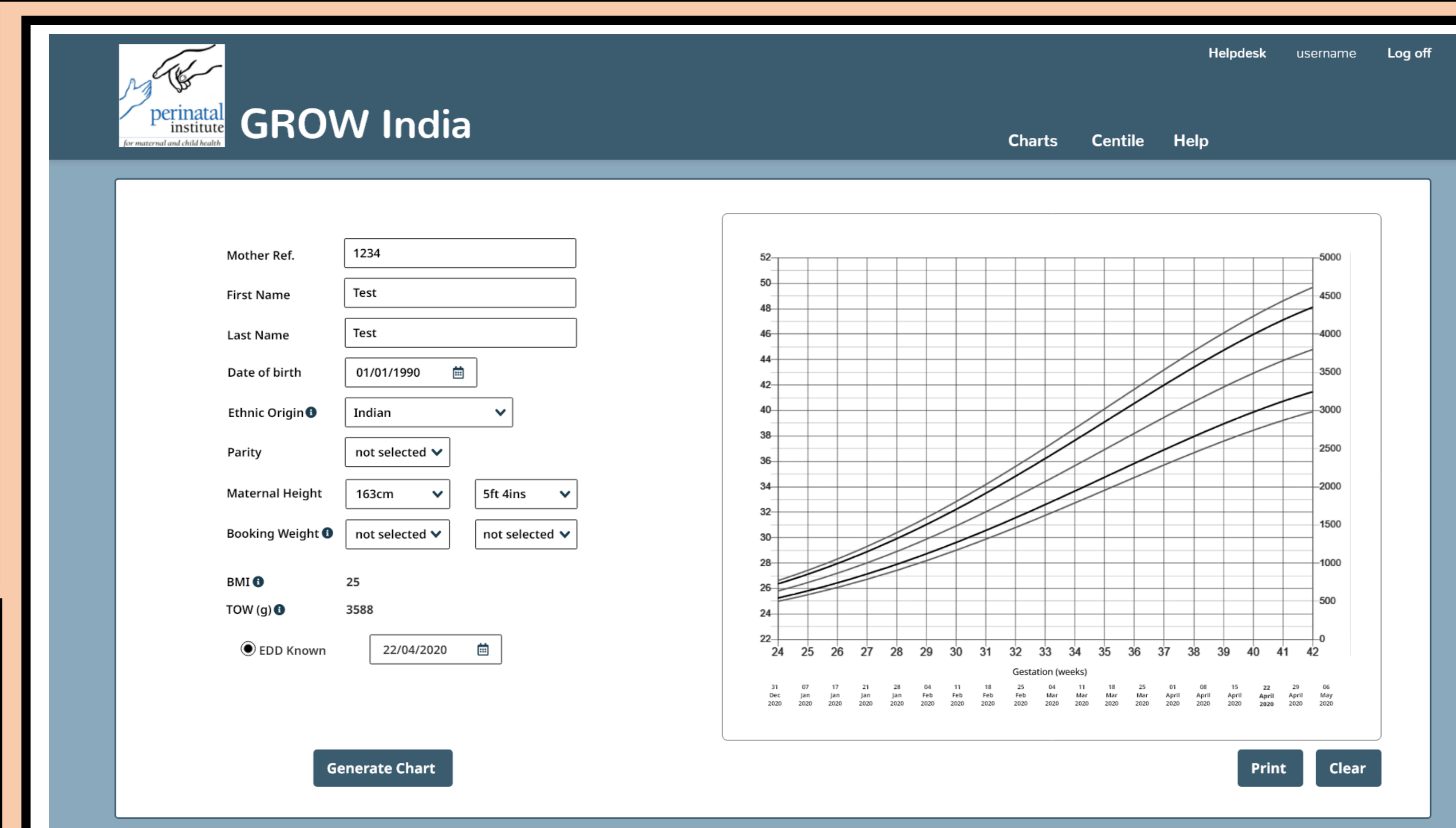
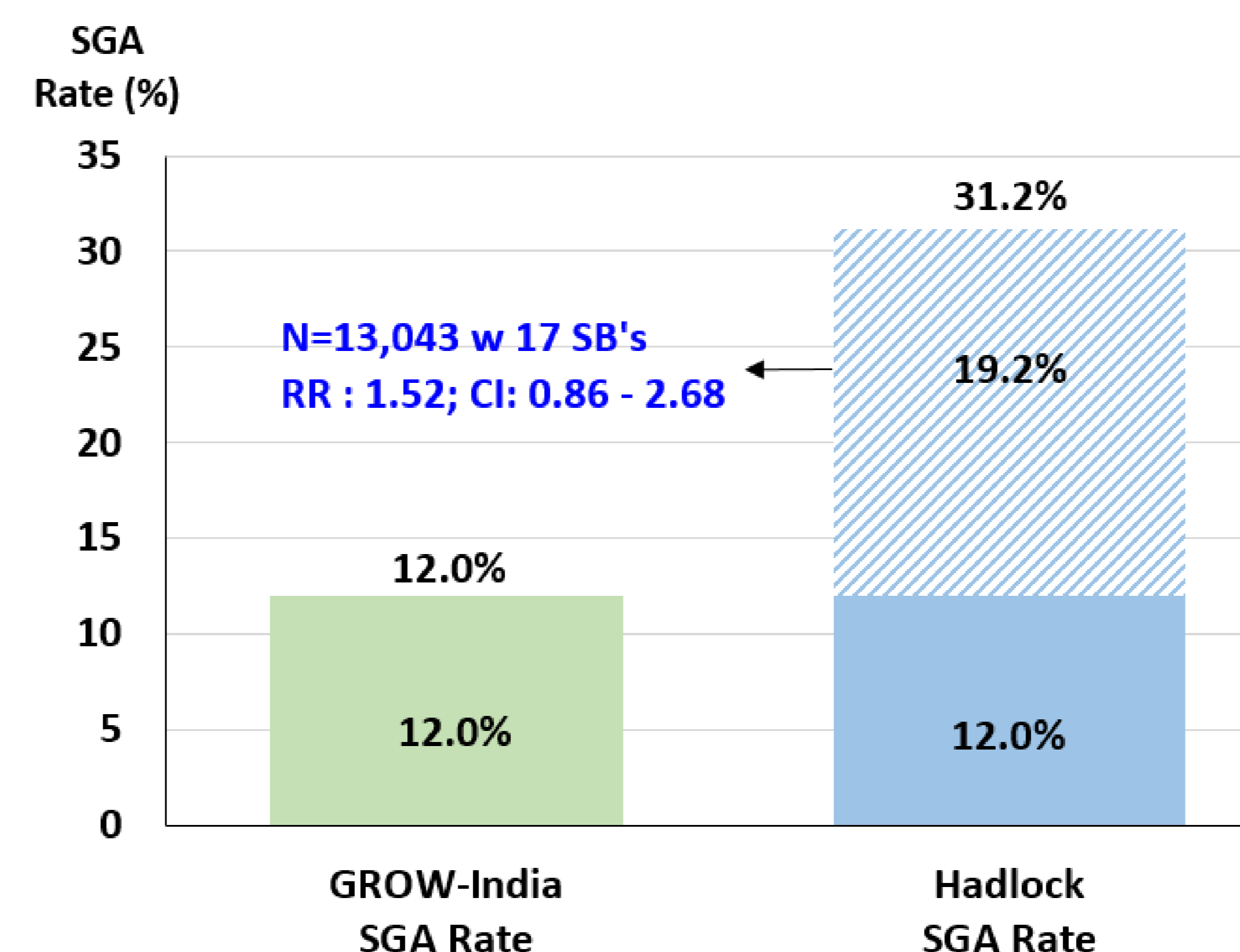


Fig 2 South Asian ≥32 week stillbirth & SGA rates by GROW India and Hadlock standards. N= 67,808; SB n=92



Results

- Hadlock classified 21,184 of births as SGA (31.2%) including 57 stillbirths (RR 3.14, CI 2.10-4.71).
- GROW India designated 8,141 births as SGA (12.0%) including 40 stillbirths (RR 5.74; CI 3.70-8.89).
- The 17 additional stillbirths occurred among the 13,043 deliveries that were SGA by Hadlock and not by GROW-India (Fig 2)
- The risk of stillbirth in this subgroup of pregnancies was RR 1.52 (CI 0.86 – 2.68), i.e. not increased compared to those non-SGA by either method.
- Thus 61.6% (13,043/21,184) of pregnancies designated as SGA by Hadlock only did not have an increased stillbirth risk.

Conclusions

Compared to a standard that is adjusted to the local population, the Hadlock growth chart leads to substantial overdiagnosis of SGA in Indian pregnancies that are not at increased risk of stillbirth.