RESULTS: Overall, 1288 women with thalassemia traits (348 of α thal-1 trait, 424 of β thal trait and 516 of HbE trait) and 1305 women in the control group were recruited. Maternal age, BMI and parity were similar between two groups. The hematocrit level at the 1st trimester in the thalassemia trait group was significantly lower than that in the control group (34.8±3.4% VS 36.9±3.0%; p<0.001). Table 1; the risk of pregnancy induced hypertension (PIH) and Apgar score < 7 at 1 minute were significantly higher in the thalassemia trait group compared to the control group (6.9% VS 4.7%, p=0.018 and 4.1% VS 2.5%, p=0.02). A subgroup was also analyzed between each thalassemia trait (Table 2), showing that the numbers of maternal anemia in the 1st and 3rd trimester were higher in all thalassemia traits compared to the normal group (p<0.001). β thal trait and HbE trait increased the risk of PIH with relative risk (RR) = 1.67 and 1.66, respectively. Additionally, the rate of neonates with Apgar score < 7 at 1 minute was significantly higher in the HbE trait; RR = 2.06. There was no significant difference in other maternal and neonatal outcomes.

CONCLUSION: Thalassemia traits significantly increase the risk of hypertensive disorders in pregnancy and low Apgar score at 1 minute. Physiologic change during pregnancy may worsen the severity of anemia in pregnant women affected by thalassemia traits.

Table 1: Pregnancy outcomes of thalassemia traits and control groups

	Thalassemia traits group (n=1288)	Control group (n=1305)	p-value*
Hematocrit level at the 1st trimester	**34.8±3.4**	**36.9±3.0**	**<0.001**
Anemia at the 1st trimester; n(%)	**377 (29.3%)**	**119 (9.1%)**	**<0.001**
Anemia at the 3rd trimester; n(%)	**428 (33.2%)**	**156 (12.0%)**	**<0.001**
Gestational age at delivery (weeks);	38.3±1.6	38.3±1.5	0.469
Stillbirth; n(%)	3 (0.2%)	0 (0.0%)	0.122
Birth weight (grams);	3048.0±443.4	3069.3±451.6	0.309
Preterm birth; n(%)	106 (8.2%)	91 (7.0%)	0.236
SGA; n(%)	111 (8.6%)	105 (8.0%)	0.619
LBW**; n(%)	56 (4.7%)	69 (5.7%)	0.314
Apgar Score < 7 at 1 minute; n(%)	**53 (4.1%)**	**32 (2.5%)**	**0.020**
NICU admission; n(%)	13 (1.0%)	11 (0.8%)	0.687

*p-value: calculated by chi-square test for categorical data and t-test for continuous data

**LBW; analyzed for alive term newborn only (1179 in thalassemia traits and 1214 in control group)

PPH: postpartum hemorrhage, PIH: pregnancy induced hypertension, GDM: gestational diabetes mellitus, SGA: small for gestational age, LBW: low birth weight, NICU: neonatal intensive care unit

Table 2: Subgroup analysis of significantly different variables among thalassemia trait groups

	Control (n=1305)	Alpha thal-1 trait (n=348)	Beta thal trait (n=424)	HbE trait (n=516)	p-value*
Hematocrit level at the 1st trimester;	36.9±3.0	35.1±3.3	33.4±3.2	35.7±3.2	< 0.001
Anemia at the 1st trimester; n(%)	119 (9.1%)	89 (25.6%)	199 (46.9%)	89 (17.2%)	< 0.001
RR (95% CI)	**1**	**2.80 (2.19-3.59)****	**5.15 (4.22-6.28)****	**1.89 (1.47-2.44)****	
Anemia at the 3rd trimester; n(%)	156 (12.0%)	92 (26.4%)	206 (48.6%)	130 (25.2%)	< 0.001
RR (95% CI)	**1**	**2.21 (1.76-2.78)****	**4.06 (3.41-4.85)****	**2.11 (1.71-2.60)****	
PIH; n(%)	61 (4.7%)	16 (4.6%)	33 (7.8%)	40 (7.8%)	0.018
RR (95% CI)	**1**	0.98 (0.59-1.71)	**1.67 (1.11-2.51)****	**1.66 (1.13-2.44)****	
Apgar Score < 7 at 1 minute; n(%)	32 (2.5%)	13 (3.7%)	14 (3.3%)	26 (5.1%)	0.020
RR (95% CI)	**1**	1.52 (0.81-2.87)	1.35 (0.73-2.51)	**2.06 (1.24-3.43)****	

*p-value: calculated by chi-square test for categorical data and ANOVA for continuous data

**statistically significant

RR: relative risk, 95% CI: 95% confidence interval, PIH: pregnancy induced hypertension

490 Maternal mortality at a referral hospital in south western uganda: a 5 year descriptive analysis

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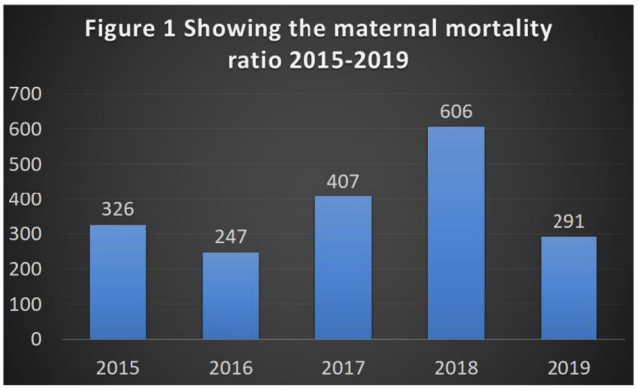
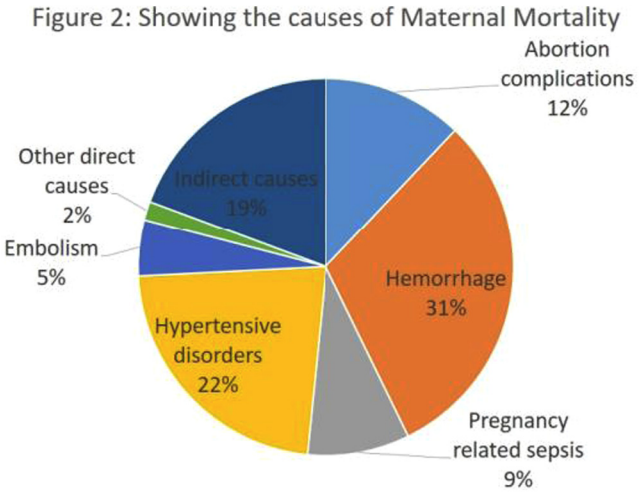
OBJECTIVE: To determine trends in the rates and causes of maternal mortality and describe clinical features among maternal deaths at the Mbarara Regional Referral Hospital (MRRH) in South-Western, Uganda.

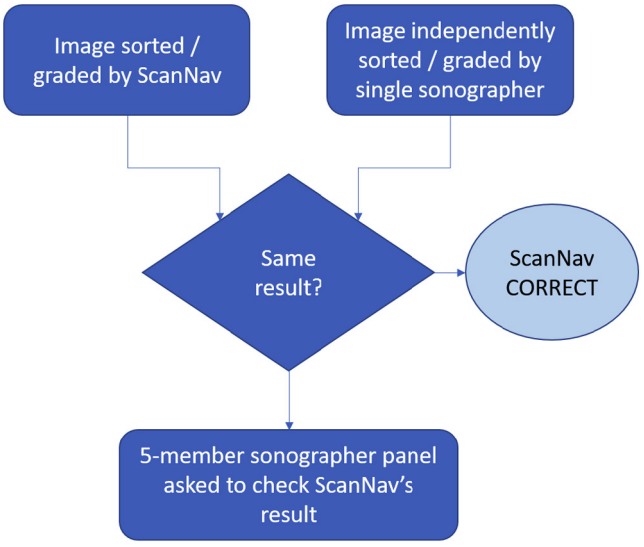
STUDY DESIGN: We performed a review of maternal deaths at MRRH between 2015-2019 with data extracted from prospective audits conducted within 24 hours of a maternal death using Uganda Ministry of Health standardized forms. Data included demographics, antenatal, intrapartum and postpartum care processes, cause and timing of death, and health system factors such as referral pathways. To assess completeness of data, we compared the number of audits available with departmental monthly maternity statistics reports. Maternal mortality ratio (MMR) was computed using data on live births from monthly reports. Descriptive statistics were presented using means and medians for continuous variables and proportions used for categorical variables.

RESULTS: There were 44,592 livebirths and 164 maternal deaths between 2015 and 2019, with a ~ 8918 births/year and MMR 375 per 100,000 live births. MMR ranged from 247 in 2016 to 606 in 2018 as in figure 1. Audit forms were completed for 124/164 (76%) of cases. Causes of death are presented in Figure 2. Most women were <30 years (62%), multiparous (76%) and were referred from another health facility (71%). Most (35%) of the women experienced delay one. The majority (83%) were unstable or critical on arrival: 52% had an abnormal vital sign, 25% were unconscious and 7% were dead on arrival. Most deaths (41%) occurred within 24 hours of admission.

CONCLUSION: Facility-based MMR is high at this tertiary referral hospital. Leading causes of maternal death are consistent with global patterns, though unlike patterns in many low-income countries indirect causes are also common. Given the large proportion of referrals, clinical status on arrival and short time frame prior to death quality improvement strategies are needed to target referral pathways and immediate critical care and stabilization of women to make progress to reducing facility-based maternal mortality.







# Sonographers agree with ScanNav	ScanNav
0	INCORRECT
1	INCORRECT
2	CORRECT
3	CORRECT
4	CORRECT
5	CORRECT

491 ScanNav® audit: an AI-powered screening assistant for fetal anatomical ultrasound

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OBJECTIVE: To develop and evaluate a real-time Artificial Intelligence (AI) based system to automatically keep track of acquired images; and check that the images conform to imaging protocol standards, in essence, replacing a human peer reviewer.

STUDY DESIGN: We developed an AI system (ScanNav) which automatically (1) checks the completeness of the imaging record during fetal anomaly screening, ensuring all 19 required fetal views are recorded; and (2) assesses the quality of these images (in this case according to the guidelines of ISUOG). First, AI algorithms were trained on images manually evaluated by a pool of experienced sonologists and using state-of-the-art deep learning technology. The resulting algorithm was then assessed on a separate testing set; it was deemed correct if 2 or more (from a panel of 5) independent sonologists agreed with its decision. Due to the lack of expert agreement for "marginal" images, it was deemed appropriate to include as agreement such a 2:3 panel split.

RESULTS: The system was developed on 479,322 anonymised images from 48,161 routine mid-trimester scans. Agreement between ScanNav and the sonologist panel was performed on an independent set of 38,840 images (4,284 scans). For scan completeness the mean (standard deviation) of agreement between ScanNav and the sonologists was 93.5% (±5.6%); for image quality it was 92.2% (±4.7%). The system processes 11 frames per second on a PC with an RTX4000 GPU.

CONCLUSION: A real-time AI system was developed and extensively evaluated to automatically assess completeness and quality-check fetal ultrasound images against guidelines. Acting as a peer-reviewer it performs as well as an experienced sonologist. Within clinical practice such a system could ensure imaging records of scans are complete and conforming to a well-defined protocol. By improving the confidence of trainee and less experienced sonologists, the system has the potential to help the expansion of the sonologist workforce, while it can support expert sonologists by improving workflow.

492 Ursodeoxycholic acid and perinatal outcomes in intrahepatic cholestasis of pregnancy: an individual patient data meta-analysis

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OBJECTIVE: Ursodeoxycholic acid (UDCA) is a commonly used pharmacological treatment for intrahepatic cholestasis of pregnancy (ICP), yet the largest clinical trial of its use detected minimal benefit for a composite perinatal outcome (stillbirth, preterm birth and neonatal unit admission), and evidence for perinatal benefit was not concluded in the 2020 Cochrane review. We aimed to determine whether UDCA affects adverse fetal and maternal outcomes for singleton pregnancies using an individual patient data meta-analysis of participants of randomized controlled trials (RCTs).

STUDY DESIGN: Following a systematic review of the literature, authors were invited to submit individual patient data. We performed a fixed-effects meta-analysis using multilevel modelling, adjusting for bile acid concentration at randomization and parity. Analyses were performed in STATA version 16.0; this was part of a study registered in PROSPERO: CRD42019131495.

RESULTS: Data were provided for 755 women from four RCTs, of whom 388 (51%) took UDCA. UDCA treatment was not associated with a difference in stillbirth (adjusted odds ratio 0.40, 95% confidence interval 0.04 to 4.68, p=0.469). However, UDCA was associated with a reduced composite of stillbirth and preterm birth (aOR