

T21032 Anthropometric Indices and Comparative Analysis SEP22

Mothusi_PhD

29 October, 2022

Contents

1	Overview of Report	2
1.1	Birth dataset descriptors	2
1.2	Month18 Dataset	7
1.3	Maternal-Anthro Dataset	15
2	Additional investigations	22
2.1	Compare child growth measures between HIV exposure	22
2.2	Compare child growth measures between IUGR	25
2.3	Compare child growth measures between breastfeeding practices	28
2.4	Grouped child growth investigation	42

1 Overview of Report

We are working with 3 different datasets:

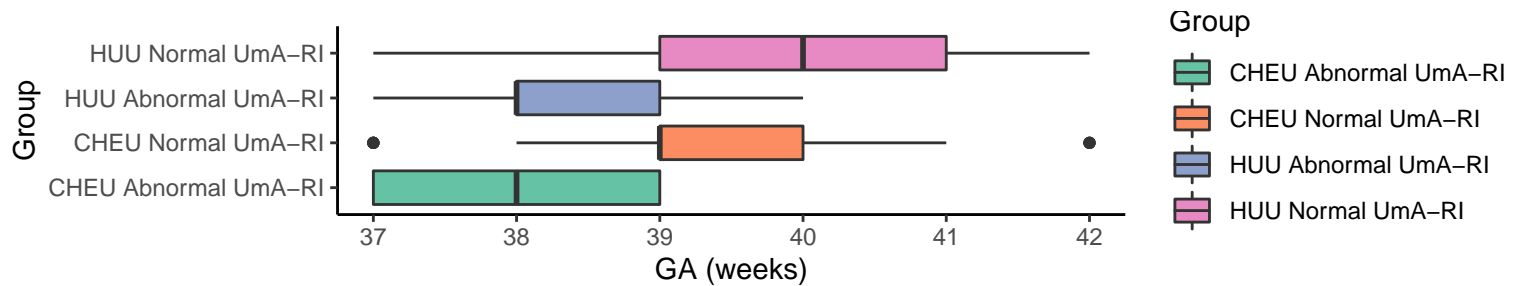
- The 'Birth' dataset which contains 271 Observations and 16 variables
- The 'Month18' dataset which contains 271 Observations and 22 variables
- The 'Maternal-Anthro' dataset which contains 266 Observations and 12 variables

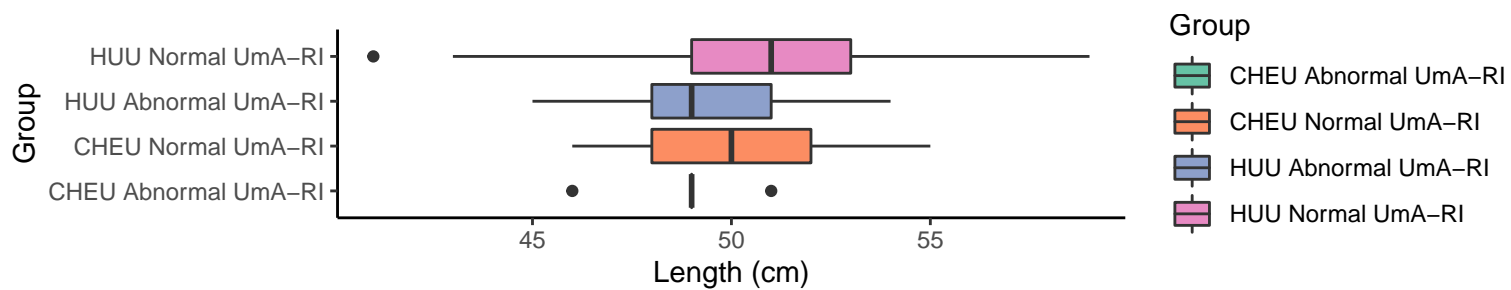
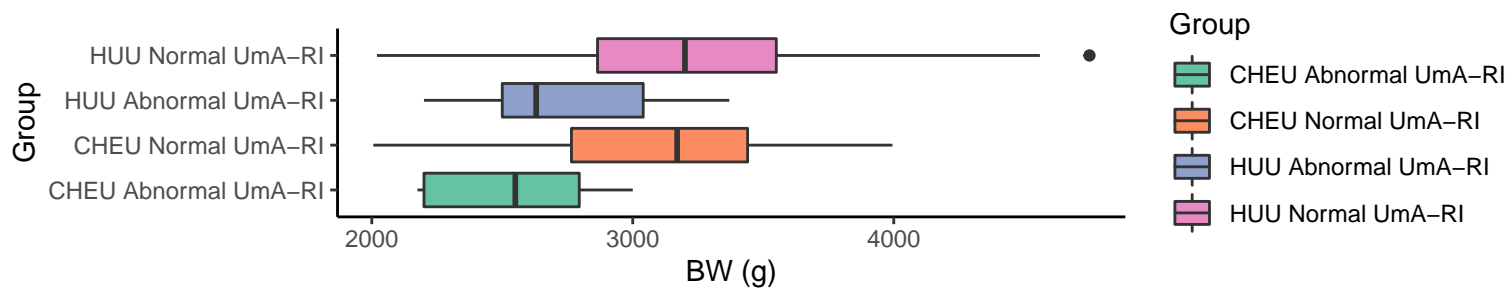
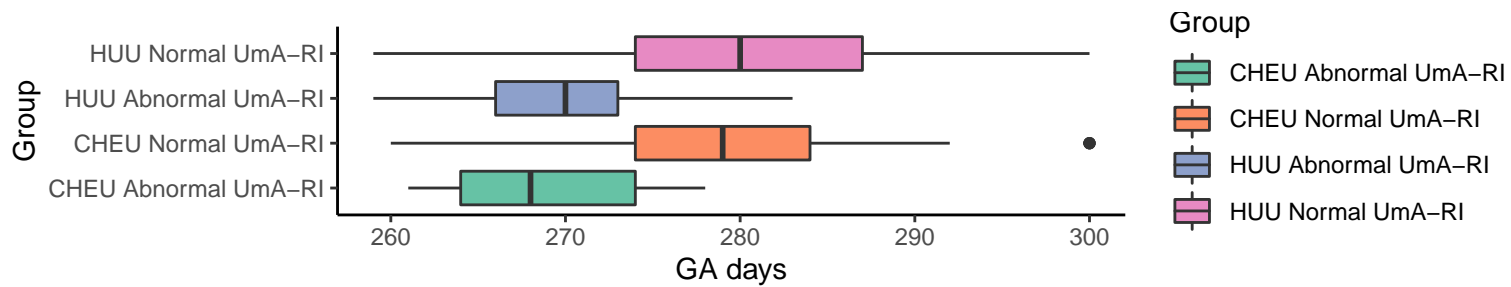
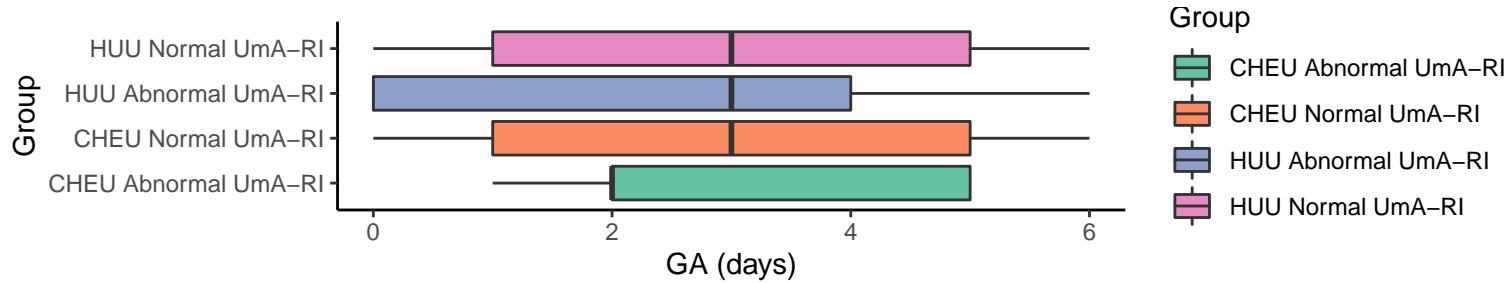
1.1 Birth dataset descriptors

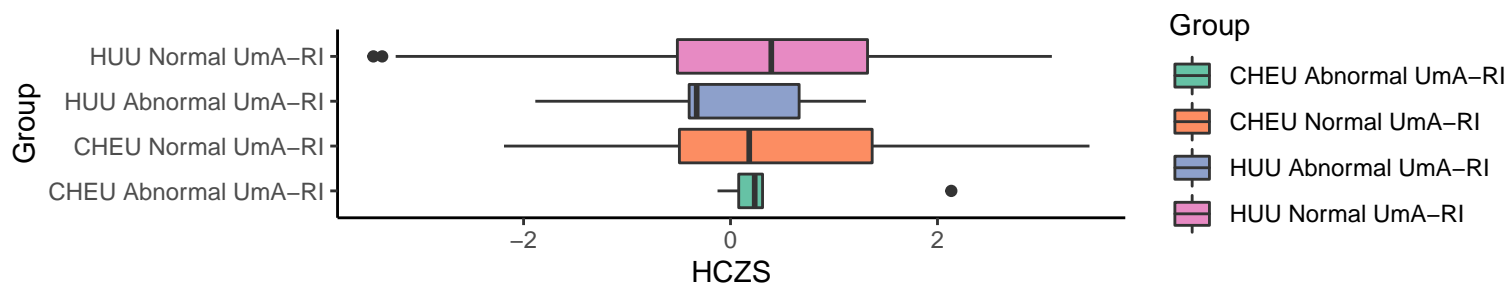
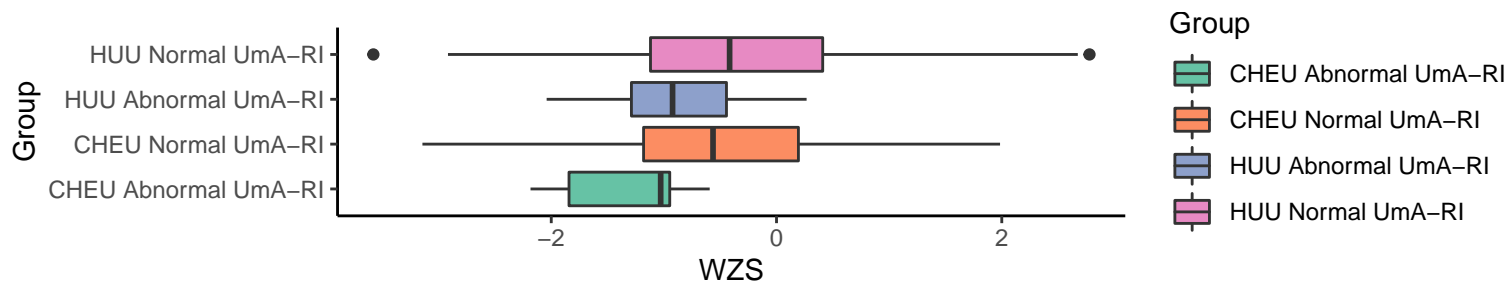
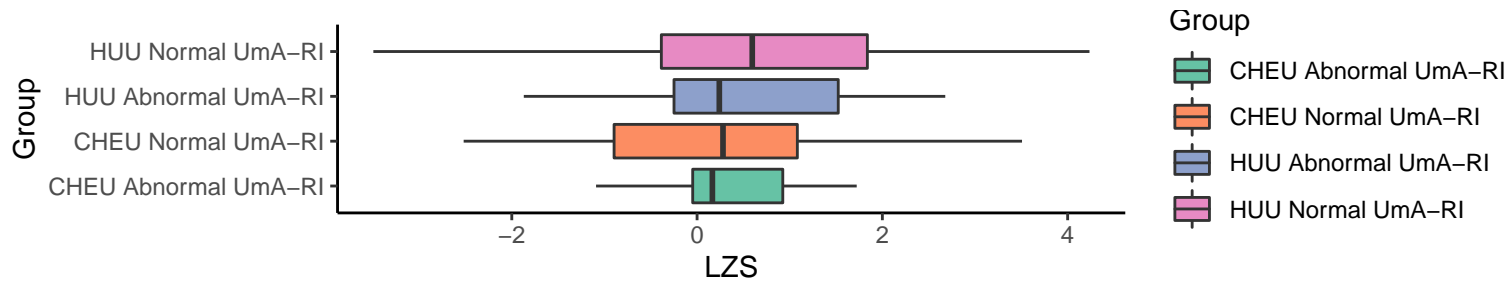
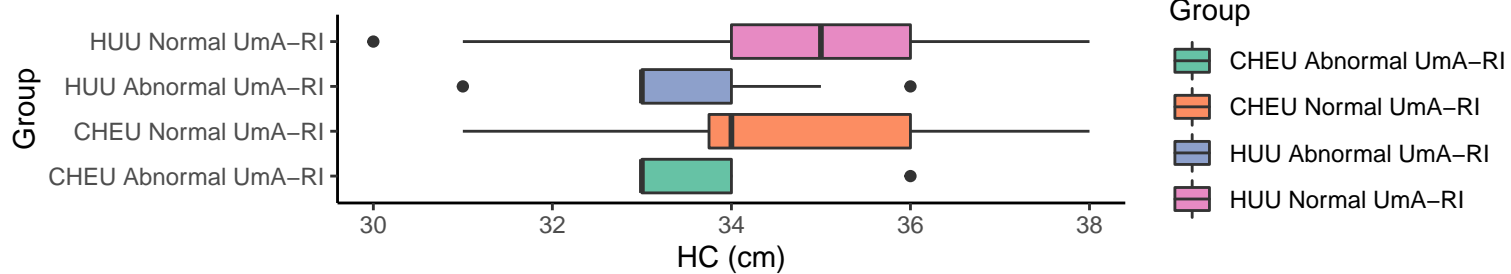
	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
Sex					
Missing Values	0	0	0	0	0
Female	121 (50.8%)	5 (100.0%)	22 (44.9%)	6 (46.2%)	88 (51.5%)
Male	117 (49.2%)	0 (0.0%)	27 (55.1%)	7 (53.8%)	83 (48.5%)
Classification					
Missing Values	0	0	0	0	0
LR-Prem	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
HR-PEDF	18 (7.6%)	5 (100.0%)	0 (0.0%)	13 (100.0%)	0 (0.0%)
LR-FT	220 (92.4%)	0 (0.0%)	49 (100.0%)	0 (0.0%)	171 (100.0%)
Mother: HIV status					
Missing Values	0	0	0	0	0
Positive	54 (22.7%)	5 (100.0%)	49 (100.0%)	0 (0.0%)	0 (0.0%)
Negative	184 (77.3%)	0 (0.0%)	0 (0.0%)	13 (100.0%)	171 (100.0%)
Group					
Missing Values	0	0	0	0	0
HUU Normal	171 (71.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	171 (100.0%)
Doppler					
CHEU Normal	49 (20.6%)	0 (0.0%)	49 (100.0%)	0 (0.0%)	0 (0.0%)
Doppler					
HUU Abnormal	13 (5.5%)	0 (0.0%)	0 (0.0%)	13 (100.0%)	0 (0.0%)
Doppler					
CHEU Abnormal	5 (2.1%)	5 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Doppler					
GA (weeks)					
Missing Values	0	0	0	0	0
min	37	37	37	37	37
max	42	39	42	40	42
mean (sd)	39.51 ± 1.34	38.00 ± 1.00	39.45 ± 1.24	38.23 ± 1.01	39.67 ± 1.33

	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
median (iqr)	39.00 (39.00, 40.00)	38.00 (37.00, 39.00)	39.00 (39.00, 40.00)	38.00 (38.00, 39.00)	40.00 (39.00, 41.00)
mean (CI)	39.51 (95% CI: 39.34, 39.68)	38.00 (95% CI: 37.12, 38.88)	39.45 (95% CI: 39.10, 39.80)	38.23 (95% CI: 37.68, 38.78)	39.67 (95% CI: 39.47, 39.87)
GA (days)					
Missing Values	0	0	0	0	0
min	0	1	0	0	0
max	6	5	6	6	6
mean (sd)	2.95 \pm 2.14	3.00 \pm 1.87	3.14 \pm 2.03	2.62 \pm 2.22	2.92 \pm 2.18
median (iqr)	3.00 (1.00, 5.00)	2.00 (2.00, 5.00)	3.00 (1.00, 5.00)	3.00 (0.00, 4.00)	3.00 (1.00, 5.00)
mean (CI)	2.95 (95% CI: 2.68, 3.22)	3.00 (95% CI: 1.36, 4.64)	3.14 (95% CI: 2.57, 3.71)	2.62 (95% CI: 1.41, 3.82)	2.92 (95% CI: 2.59, 3.25)
GA days					
Missing Values	0	0	0	0	0
min	259	261	260	259	259
max	300	278	300	283	300
mean (sd)	279.54 \pm 9.51	269.00 \pm 7.00	279.29 \pm 8.96	270.23 \pm 6.95	280.63 \pm 9.37
median (iqr)	279.00 (273.00, 285.00)	268.00 (264.00, 274.00)	279.00 (274.00, 284.00)	270.00 (266.00, 273.00)	280.00 (274.00, 287.00)
mean (CI)	279.54 (95% CI: 278.33, 280.75)	269.00 (95% CI: 262.86, 275.14)	279.29 (95% CI: 276.78, 281.80)	270.23 (95% CI: 266.45, 274.01)	280.63 (95% CI: 279.22, 282.03)
BW (g)					
Missing Values	0	0	0	0	0
min	2006	2175	2006	2200	2020
max	4750	3000	3995	3370	4750
mean (sd)	3,162.66 \pm 462.99	2,544.00 \pm 362.45	3,115.12 \pm 434.24	2,767.69 \pm 346.56	3,224.40 \pm 454.27
median (iqr)	3,170.00 (2,812.50, 3,480.00)	2,550.00 (2,200.00, 2,795.00)	3,170.00 (2,765.00, 3,440.00)	2,630.00 (2,500.00, 3,040.00)	3,200.00 (2,865.00, 3,550.00)
mean (CI)	3,162.66 (95% CI: 3,103.84, 3,221.48)	2,544.00 (95% CI: 2,226.31, 2,861.69)	3,115.12 (95% CI: 2,993.54, 3,236.71)	2,767.69 (95% CI: 2,579.30, 2,956.08)	3,224.40 (95% CI: 3,156.32, 3,292.49)
Length (cm)					
Missing Values	8	0	3	0	5
min	41	46	46	45	41
max	59	51	55	54	59
mean (sd)	230; 50.51 \pm 2.82	48.80 \pm 1.79	46; 49.91 \pm 2.35	49.46 \pm 2.73	166; 50.81 \pm 2.93
median (iqr)	230; 50.00 (49.00, 52.00)	49.00 (49.00, 49.00)	46; 50.00 (48.00, 52.00)	49.00 (48.00, 51.00)	166; 51.00 (49.00, 53.00)
mean (CI)	50.51 (95% CI: 50.15, 50.88)	48.80 (95% CI: 47.23, 50.37)	49.91 (95% CI: 49.24, 50.59)	49.46 (95% CI: 47.98, 50.94)	50.81 (95% CI: 50.37, 51.26)
HC (cm)					
Missing Values	6	0	1	0	5
min	30	33	31	31	30
max	38	36	38	36	38
mean (sd)	232; 34.50 \pm 1.54	33.80 \pm 1.30	48; 34.52 \pm 1.50	33.46 \pm 1.20	166; 34.60 \pm 1.55

	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
median (iqr)	232; 34.00 (33.00, 36.00)	33.00 (33.00, 34.00)	48; 34.00 (33.75, 36.00)	33.00 (33.00, 34.00)	166; 35.00 (34.00, 36.00)
mean (CI)	34.50 (95% CI: 34.30, 34.70)	33.80 (95% CI: 32.66, 34.94)	34.52 (95% CI: 34.10, 34.95)	33.46 (95% CI: 32.81, 34.11)	34.60 (95% CI: 34.36, 34.83)
LengthZScore					
Missing Values	8	0	3	0	5
min	-3.4945	-1.0905	-2.5198	-1.8705	-3.4945
max	4.2357	1.7231	3.5074	2.6792	4.2357
mean (sd)	230; 0.51 ± 1.56	0.34 ± 1.06	46; 0.14 ± 1.34	0.45 ± 1.37	166; 0.62 ± 1.63
median (iqr)	230; 0.48 (-0.56, 1.64)	0.17 (-0.05, 0.93)	46; 0.28 (-0.90, 1.08)	0.24 (-0.25, 1.52)	166; 0.60 (-0.39, 1.84)
mean (CI)	0.51 (95% CI: 0.31, 0.71)	0.34 (95% CI: -0.59, 1.26)	0.14 (95% CI: -0.25, 0.52)	0.45 (95% CI: -0.29, 1.19)	0.62 (95% CI: 0.37, 0.87)
WeightZScore					
Missing Values	0	0	0	0	0
min	-3.5797	-2.1843	-3.144	-2.041	-3.5797
max	2.7786	-0.5934	1.9845	0.2671	2.7786
mean (sd)	-0.45 ± 1.07	-1.32 ± 0.67	-0.55 ± 0.97	-0.90 ± 0.70	-0.36 ± 1.11
median (iqr)	-0.53 (-1.15, 0.28)	-1.03 (-1.84, -0.95)	-0.56 (-1.18, 0.19)	-0.92 (-1.29, -0.44)	-0.42 (-1.12, 0.41)
mean (CI)	-0.45 (95% CI: -0.59, -0.31)	-1.32 (95% CI: -1.90, -0.74)	-0.55 (95% CI: -0.82, -0.28)	-0.90 (95% CI: -1.28, -0.52)	-0.36 (95% CI: -0.53, -0.19)
HeadCircumferenceZScore					
Missing Values	6	0	1	0	5
min	-3.4516	-0.1255	-2.189	-1.8866	-3.4516
max	3.4687	2.1332	3.4687	1.3086	3.1051
mean (sd)	232; 0.34 ± 1.26	0.53 ± 0.91	48; 0.33 ± 1.25	-0.04 ± 0.87	166; 0.36 ± 1.30
median (iqr)	232; 0.35 (-0.48, 1.28)	0.23 (0.08, 0.31)	48; 0.18 (-0.49, 1.37)	-0.33 (-0.40, 0.66)	166; 0.39 (-0.51, 1.32)
mean (CI)	0.34 (95% CI: 0.18, 0.50)	0.53 (95% CI: -0.28, 1.33)	0.33 (95% CI: -0.02, 0.68)	-0.04 (95% CI: -0.51, 0.44)	0.36 (95% CI: 0.17, 0.56)







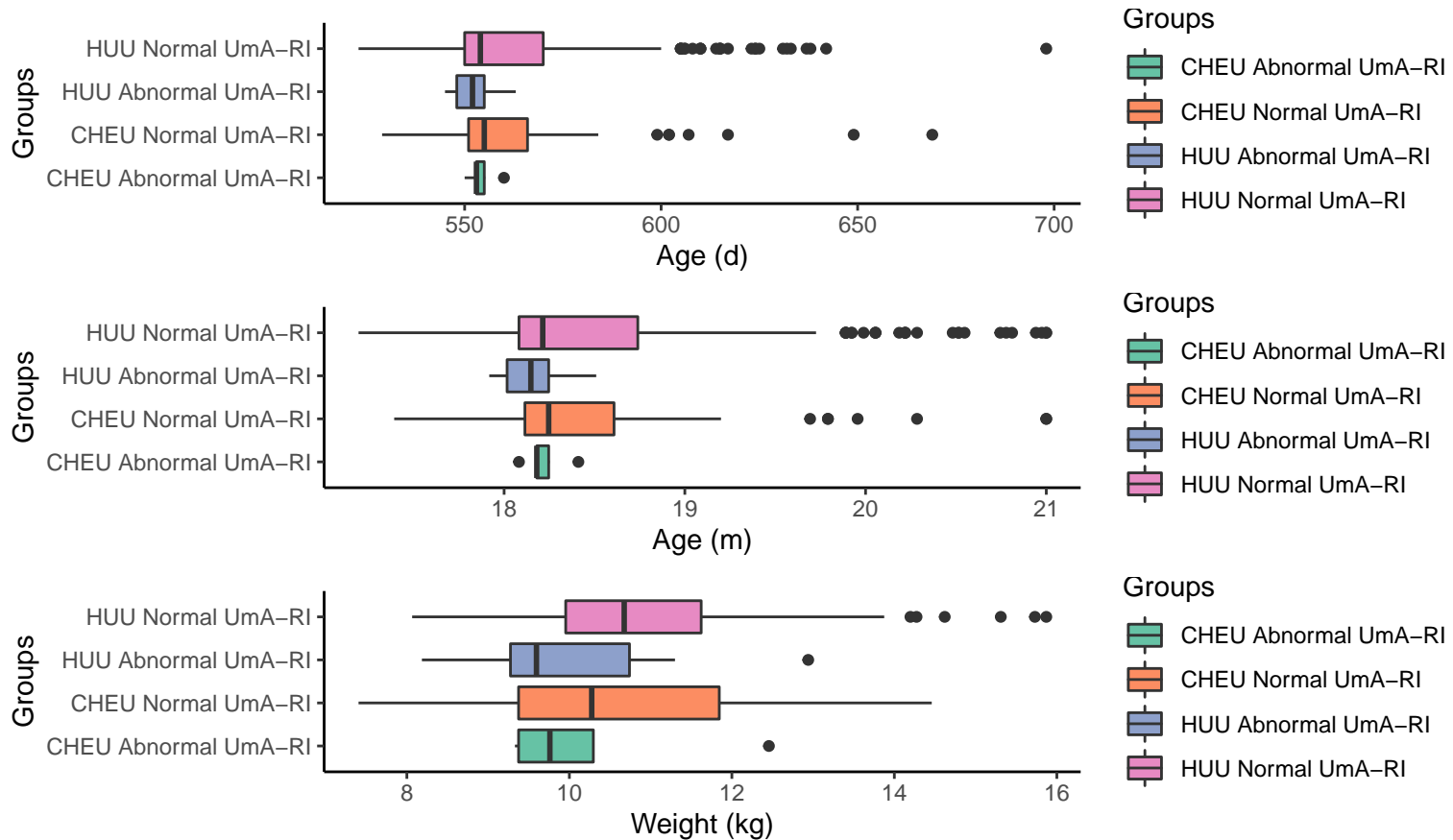
1.2 Month18 Dataset

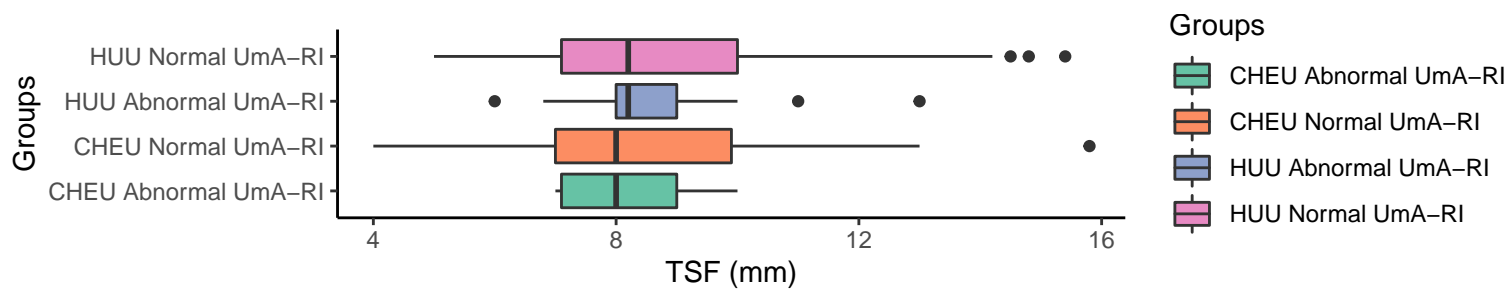
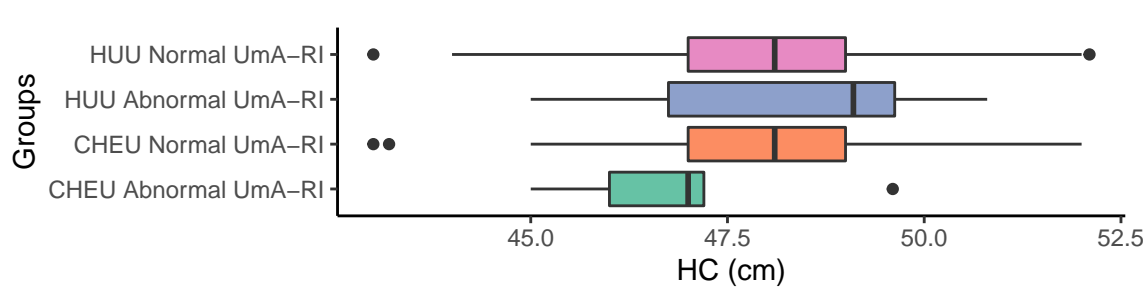
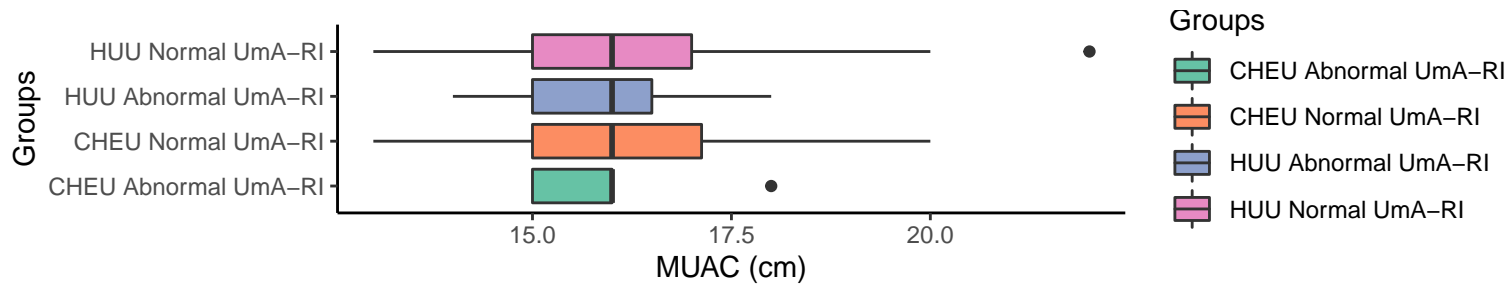
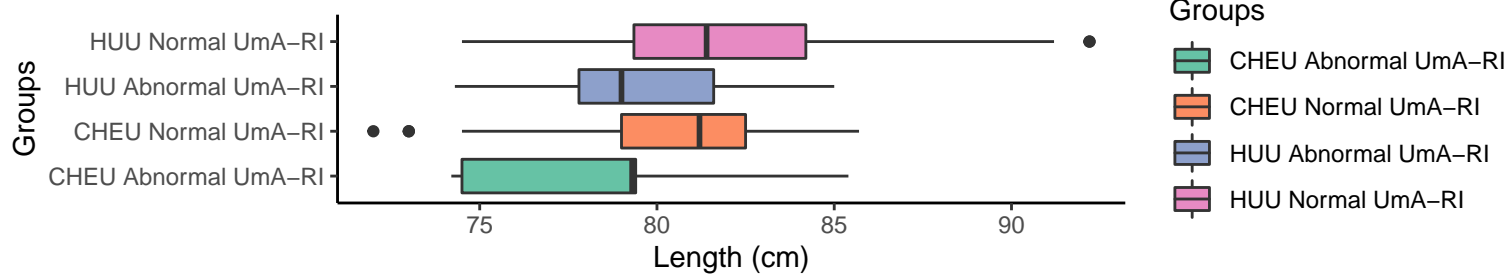
	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
UmbiBaby group					
Missing Values	0	0	0	0	0
LR-Prem	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
HR-PEDF	18 (7.6%)	5 (100.0%)	0 (0.0%)	13 (100.0%)	0 (0.0%)
LR-FT	220 (92.4%)	0 (0.0%)	49 (100.0%)	0 (0.0%)	171 (100.0%)
Maternal HIV status					
Missing Values	0	0	0	0	0
Positive	54 (22.7%)	5 (100.0%)	49 (100.0%)	0 (0.0%)	0 (0.0%)
Negative	184 (77.3%)	0 (0.0%)	0 (0.0%)	13 (100.0%)	171 (100.0%)
Sex					
Missing Values	0	0	0	0	0
Female	121 (50.8%)	5 (100.0%)	22 (44.9%)	6 (46.2%)	88 (51.5%)
Male	117 (49.2%)	0 (0.0%)	27 (55.1%)	7 (53.8%)	83 (48.5%)
Age (Days)					
Missing Values	0	0	0	0	0
min	523	550	529	545	523
max	698	560	669	563	698
mean (sd)	564.00 \pm 26.74	554.20 \pm 3.70	564.78 \pm 26.75	552.85 \pm 5.46	564.91 \pm 27.91
median (iqr)	554.00 (550.00, 565.75)	553.00 (553.00, 555.00)	555.00 (551.00, 566.00)	552.00 (548.00, 555.00)	554.00 (550.00, 570.00)
mean (CI)	564.00 (95% CI: 560.60, 567.39)	554.20 (95% CI: 550.96, 557.44)	564.78 (95% CI: 557.28, 572.27)	552.85 (95% CI: 549.88, 555.81)	564.91 (95% CI: 560.72, 569.09)
Age (Months)					
Missing Values	0	0	0	0	0
min	17.1945205479452	18.0821917808219	17.3917808219178	17.9178082191781	17.1945205479452
max	21	18.4109589041096	21	18.5095890410959	21
mean (sd)	18.53 \pm 0.83	18.22 \pm 0.12	18.54 \pm 0.78	18.18 \pm 0.18	18.56 \pm 0.87
median (iqr)	18.21 (18.08, 18.60)	18.18 (18.18, 18.25)	18.25 (18.12, 18.61)	18.15 (18.02, 18.25)	18.21 (18.08, 18.74)
mean (CI)	18.53 (95% CI: 18.42, 18.63)	18.22 (95% CI: 18.11, 18.33)	18.54 (95% CI: 18.32, 18.76)	18.18 (95% CI: 18.08, 18.27)	18.56 (95% CI: 18.43, 18.69)
Weight (kg)					
Missing Values	0	0	0	0	0
min	7.405	9.33	7.405	8.185	8.065
max	15.87	12.456	14.46	12.94	15.87
mean (sd)	10.80 \pm 1.54	10.24 \pm 1.30	10.75 \pm 1.76	10.08 \pm 1.25	10.88 \pm 1.50
median (iqr)	10.61 (9.78, 11.70)	9.76 (9.38, 10.29)	10.28 (9.38, 11.85)	9.60 (9.28, 10.74)	10.68 (9.96, 11.62)
mean (CI)	10.80 (95% CI: 10.60, 10.99)	10.24 (95% CI: 9.11, 11.38)	10.75 (95% CI: 10.26, 11.24)	10.08 (95% CI: 9.40, 10.76)	10.88 (95% CI: 10.66, 11.11)

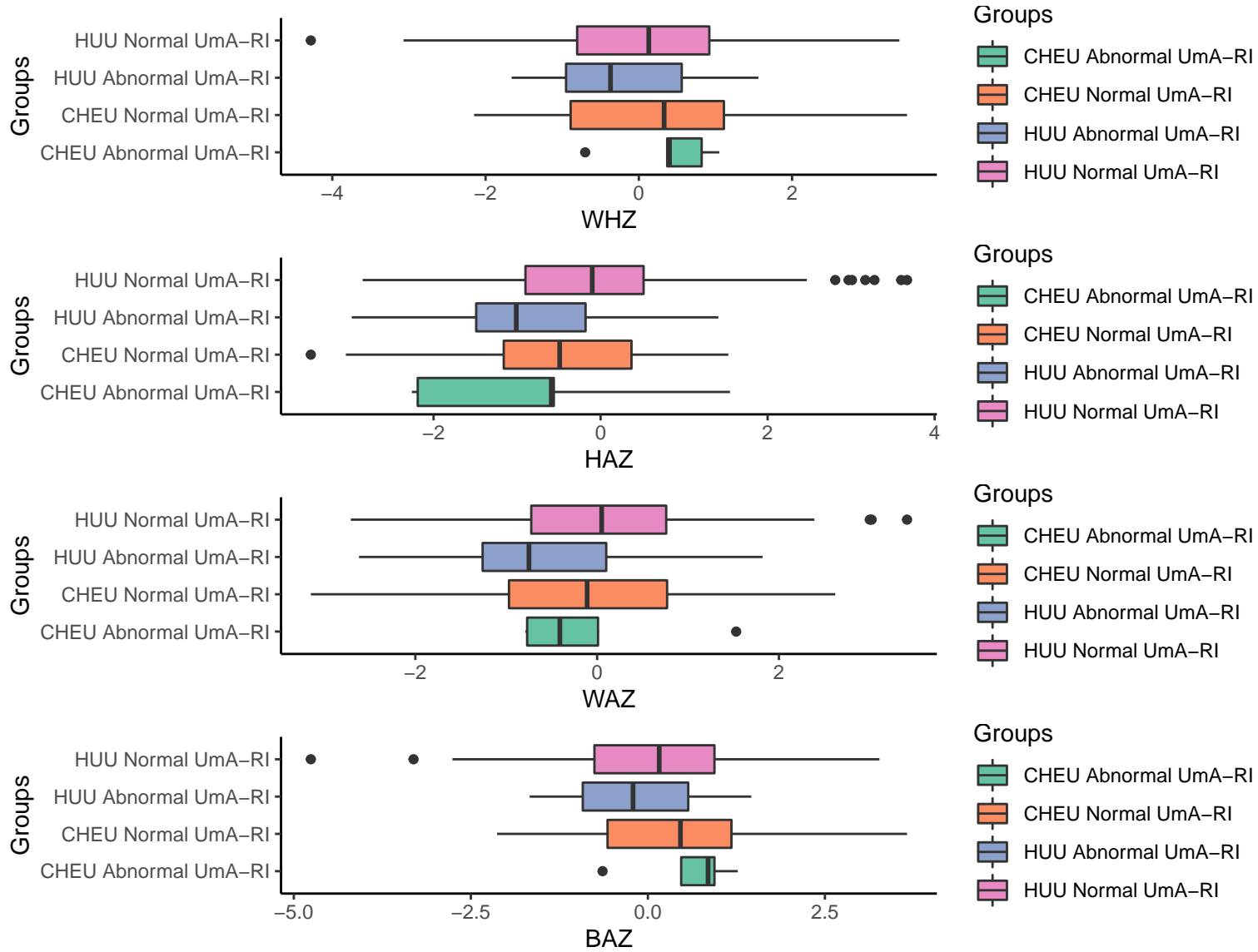
	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
Length (cm)					
Missing Values	0	0	0	0	0
min	72	74.2	72	74.3	74.5
max	92.2	85.4	85.7	85	92.2
mean (sd)	81.36 \pm 3.70	78.56 \pm 4.57	80.48 \pm 3.25	79.37 \pm 3.06	81.84 \pm 3.73
median (iqr)	81.20 (79.00, 83.50)	79.30 (74.50, 79.40)	81.20 (79.00, 82.50)	79.00 (77.80, 81.60)	81.40 (79.35, 84.20)
mean (CI)	81.36 (95% CI: 80.89, 81.83)	78.56 (95% CI: 74.55, 82.57)	80.48 (95% CI: 79.56, 81.39)	79.37 (95% CI: 77.70, 81.03)	81.84 (95% CI: 81.28, 82.40)
MUAC (cm)					
Missing Values	1	0	1	0	0
min	13	15	13	14	13
max	22	18	20	18	22
mean (sd)	237; 16.08 \pm 1.46	16.00 \pm 1.22	48; 16.24 \pm 1.67	15.92 \pm 1.18	16.06 \pm 1.43
median (iqr)	237; 16.00 (15.00, 17.00)	16.00 (15.00, 16.00)	48; 16.00 (15.00, 17.12)	16.00 (15.00, 16.50)	16.00 (15.00, 17.00)
mean (CI)	16.08 (95% CI: 15.90, 16.27)	16.00 (95% CI: 14.93, 17.07)	16.24 (95% CI: 15.77, 16.71)	15.92 (95% CI: 15.27, 16.56)	16.06 (95% CI: 15.84, 16.27)
HC (cm)					
Missing Values	6	0	0	1	5
min	43	45	43	45	43
max	52.1	49.6	52	50.8	52.1
mean (sd)	232; 48.05 \pm 1.67	46.96 \pm 1.72	48.10 \pm 1.86	12; 48.31 \pm 1.99	166; 48.05 \pm 1.59
median (iqr)	232; 48.15 (47.00, 49.00)	47.00 (46.00, 47.20)	48.10 (47.00, 49.00)	12; 49.10 (46.75, 49.62)	166; 48.10 (47.00, 49.00)
mean (CI)	48.05 (95% CI: 47.84, 48.27)	46.96 (95% CI: 45.46, 48.46)	48.10 (95% CI: 47.58, 48.62)	48.31 (95% CI: 47.18, 49.44)	48.05 (95% CI: 47.81, 48.30)
TSF (mm)					
Missing Values	5	0	0	0	5
min	4	7	4	6	5
max	15.8	10	15.8	13	15.4
mean (sd)	233; 8.63 \pm 2.02	8.22 \pm 1.28	8.41 \pm 2.24	8.69 \pm 1.85	166; 8.70 \pm 2.00
median (iqr)	233; 8.00 (7.00, 10.00)	8.00 (7.10, 9.00)	8.00 (7.00, 9.90)	8.20 (8.00, 9.00)	166; 8.20 (7.10, 10.00)
mean (CI)	8.63 (95% CI: 8.37, 8.89)	8.22 (95% CI: 7.10, 9.34)	8.41 (95% CI: 7.78, 9.03)	8.69 (95% CI: 7.68, 9.70)	8.70 (95% CI: 8.39, 9.00)
WHZ					
Missing Values	0	0	0	0	0
min	-4.28	-0.7	-2.15	-1.66	-4.28
max	3.5	1.05	3.5	1.56	3.4
mean (sd)	0.12 \pm 1.23	0.39 \pm 0.67	0.25 \pm 1.43	-0.23 \pm 1.05	0.10 \pm 1.19
median (iqr)	0.15 (-0.82, 0.97)	0.40 (0.37, 0.82)	0.33 (-0.89, 1.11)	-0.37 (-0.95, 0.56)	0.13 (-0.81, 0.92)
mean (CI)	0.12 (95% CI: -0.04, 0.27)	0.39 (95% CI: -0.20, 0.98)	0.25 (95% CI: -0.15, 0.65)	-0.23 (95% CI: -0.80, 0.35)	0.10 (95% CI: -0.08, 0.27)
HAZ					

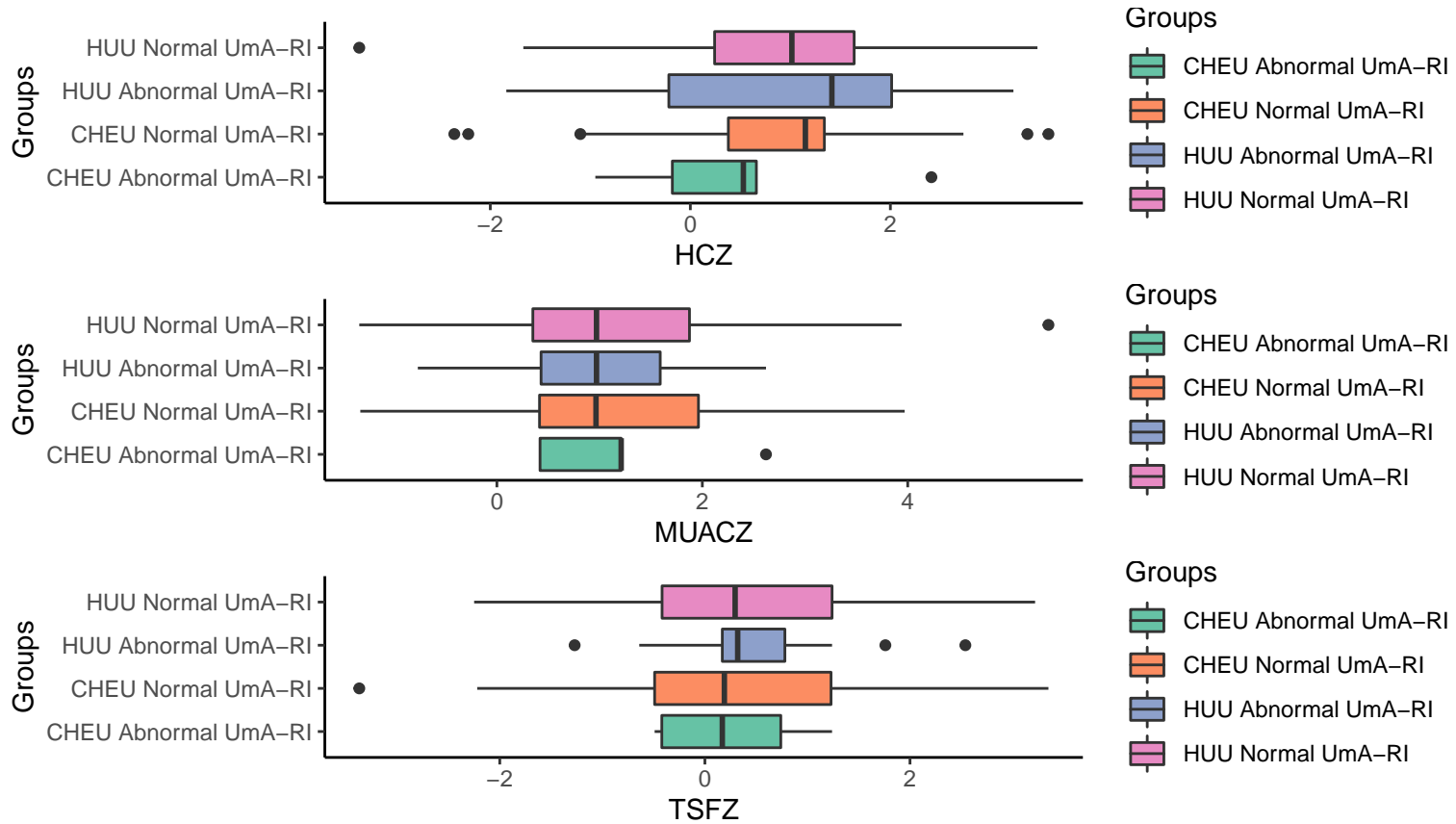
	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
Missing Values	0	0	0	0	0
min	-3.47	-2.26	-3.47	-2.98	-2.85
max	3.67	1.55	1.53	1.41	3.67
mean (sd)	-0.23 \pm 1.29	-0.81 \pm 1.56	-0.58 \pm 1.16	-0.86 \pm 1.19	-0.06 \pm 1.29
median (iqr)	-0.20 (-1.06, 0.44)	-0.59 (-2.19, -0.56)	-0.49 (-1.16, 0.37)	-1.01 (-1.49, -0.18)	-0.10 (-0.90, 0.52)
mean (CI)	-0.23 (95% CI: -0.39, -0.06)	-0.81 (95% CI: -2.17, 0.55)	-0.58 (95% CI: -0.90, -0.25)	-0.86 (95% CI: -1.51, -0.21)	-0.06 (95% CI: -0.25, 0.13)
WAZ					
Missing Values	0	0	0	0	0
min	-3.15	-0.79	-3.15	-2.62	-2.71
max	3.41	1.53	2.62	1.82	3.41
mean (sd)	-0.02 \pm 1.18	-0.09 \pm 0.96	-0.09 \pm 1.33	-0.57 \pm 1.15	0.05 \pm 1.14
median (iqr)	-0.06 (-0.82, 0.72)	-0.41 (-0.77, 0.01)	-0.11 (-0.97, 0.77)	-0.75 (-1.26, 0.10)	0.05 (-0.72, 0.76)
mean (CI)	-0.02 (95% CI: -0.17, 0.13)	-0.09 (95% CI: -0.93, 0.76)	-0.09 (95% CI: -0.46, 0.28)	-0.57 (95% CI: -1.19, 0.06)	0.05 (95% CI: -0.12, 0.22)
BAZ					
Missing Values	0	0	0	0	0
min	-4.76	-0.64	-2.13	-1.67	-4.76
max	3.66	1.27	3.66	1.46	3.27
mean (sd)	0.18 \pm 1.25	0.58 \pm 0.74	0.36 \pm 1.43	-0.06 \pm 1.03	0.13 \pm 1.22
median (iqr)	0.22 (-0.76, 0.97)	0.85 (0.47, 0.94)	0.46 (-0.57, 1.18)	-0.21 (-0.92, 0.57)	0.16 (-0.76, 0.94)
mean (CI)	0.18 (95% CI: 0.02, 0.33)	0.58 (95% CI: -0.07, 1.22)	0.36 (95% CI: -0.04, 0.76)	-0.06 (95% CI: -0.62, 0.50)	0.13 (95% CI: -0.05, 0.31)
HCZ					
Missing Values	6	0	0	1	5
min	-3.31	-0.95	-2.36	-1.84	-3.31
max	3.58	2.41	3.58	3.23	3.47
mean (sd)	232; 0.86 \pm 1.17	0.49 \pm 1.25	0.85 \pm 1.23	12; 1.02 \pm 1.50	166; 0.87 \pm 1.13
median (iqr)	232; 1.04 (0.24, 1.63)	0.53 (-0.18, 0.66)	1.15 (0.38, 1.34)	12; 1.42 (-0.22, 2.01)	166; 1.02 (0.24, 1.64)
mean (CI)	0.86 (95% CI: 0.71, 1.01)	0.49 (95% CI: -0.60, 1.59)	0.85 (95% CI: 0.51, 1.19)	1.02 (95% CI: 0.16, 1.87)	0.87 (95% CI: 0.70, 1.04)
MUACZ					
Missing Values	1	0	1	0	0
min	-1.34	0.41	-1.33	-0.77	-1.34
max	5.37	2.62	3.97	2.62	5.37
mean (sd)	237; 1.09 \pm 1.13	1.17 \pm 0.90	48; 1.19 \pm 1.26	0.97 \pm 0.96	1.06 \pm 1.11
median (iqr)	237; 0.97 (0.39, 1.90)	1.21 (0.42, 1.21)	48; 0.96 (0.42, 1.96)	0.97 (0.43, 1.59)	0.97 (0.35, 1.88)
mean (CI)	1.09 (95% CI: 0.94, 1.23)	1.17 (95% CI: 0.38, 1.96)	1.19 (95% CI: 0.83, 1.54)	0.97 (95% CI: 0.45, 1.49)	1.06 (95% CI: 0.90, 1.23)
TSFZ					
Missing Values	5	0	0	0	5

	DataA (N = 238)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
min	-3.37	-0.49	-3.37	-1.27	-2.25
max	3.35	1.24	3.35	2.54	3.22
mean (sd)	233; 0.40 ± 1.12	0.25 ± 0.75	0.24 ± 1.28	0.49 ± 1.01	166; 0.45 ± 1.09
median (iqr)	233; 0.21 (-0.48, 1.24)	0.17 (-0.42, 0.74)	0.19 (-0.49, 1.23)	0.32 (0.17, 0.78)	166; 0.29 (-0.42, 1.24)
mean (CI)	0.40 (95% CI: 0.26, 0.54)	0.25 (95% CI: -0.41, 0.90)	0.24 (95% CI: -0.12, 0.60)	0.49 (95% CI: -0.06, 1.03)	0.45 (95% CI: 0.28, 0.61)









The following investigation will compare each of the three groups against our baseline (normal group) in order to determine if significant differences exists. In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the independent t-test was used to compare the groups while the Mann Whitney U tests was used in the non-normal cases. All tests were performed at a 5% level of significance.

1.2.1 HUU Normal vs HUU Abnormal

The p-value for WHZ was: 0.3111 which indicate no significant difference.

The p-value for HAZ was: 0.0383 * which indicate a significant difference.

The p-value for WAZ was: 0.0852 which indicate no significant difference.

The p-value for BAZ was: 0.5348 which indicate no significant difference.

The p-value for HCZ was: 0.7458 which indicate no significant difference.

The p-value for MUACZ was: 0.9118 which indicate no significant difference.

The p-value for TSFZ was: 0.9424 which indicate no significant difference.

1.2.2 HUU Normal vs HEU normal

The p-value for WHZ was: 0.5062 which indicate no significant difference.

The p-value for HAZ was: 0.0603 which indicate no significant difference.

The p-value for WAZ was: 0.516 which indicate no significant difference.

The p-value for BAZ was: 0.3129 which indicate no significant difference.

The p-value for HCZ was: 0.9281 which indicate no significant difference.

The p-value for MUACZ was: 0.617 which indicate no significant difference.

The p-value for TSFZ was: 0.2761 which indicate no significant difference.

1.2.3 HUU Normal vs HEU Abnormal

The p-value for WHZ was: 0.3973 which indicate no significant difference.

The p-value for HAZ was: 0.1875 which indicate no significant difference.

The p-value for WAZ was: 0.7724 which indicate no significant difference.

The p-value for BAZ was: 0.2514 which indicate no significant difference.

The p-value for HCZ was: 0.542 which indicate no significant difference.

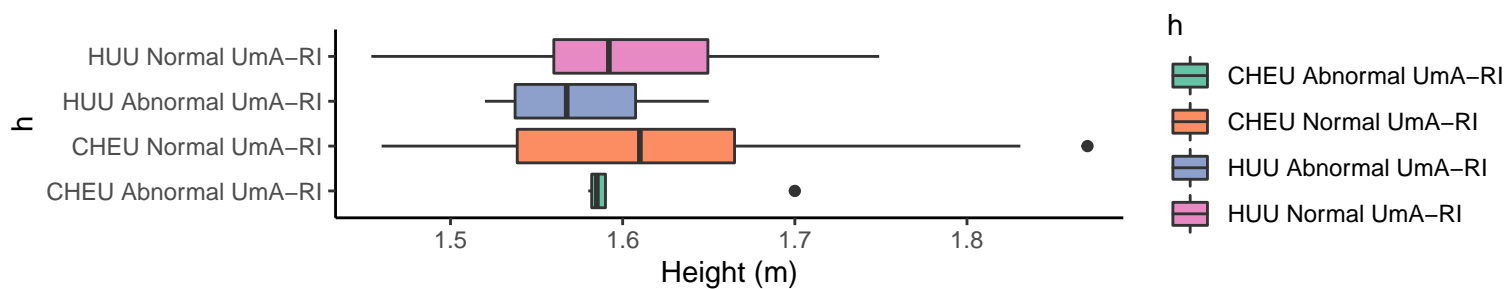
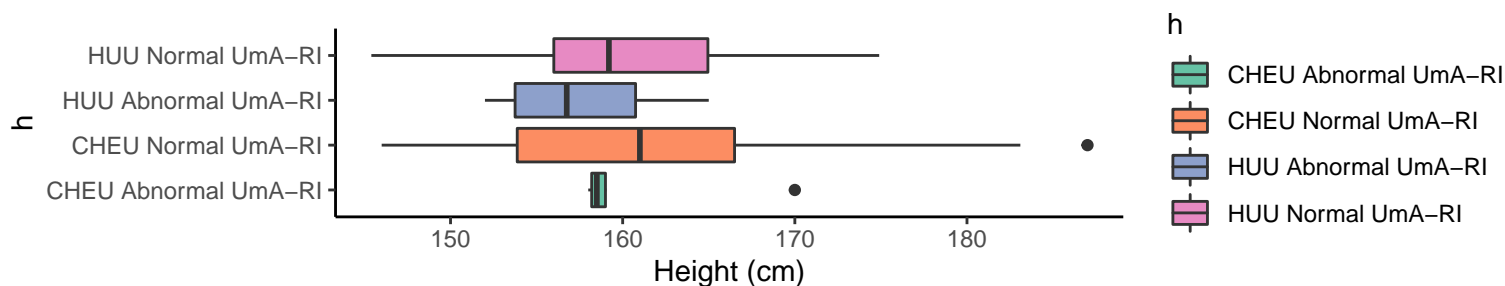
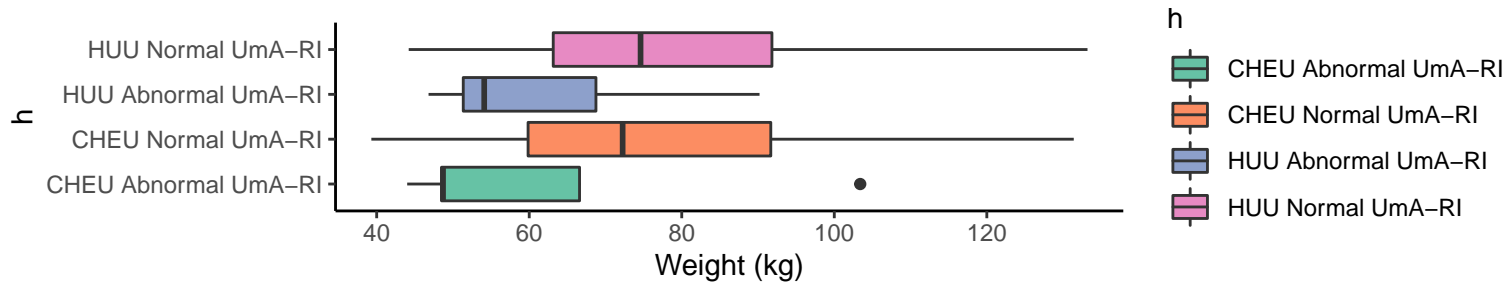
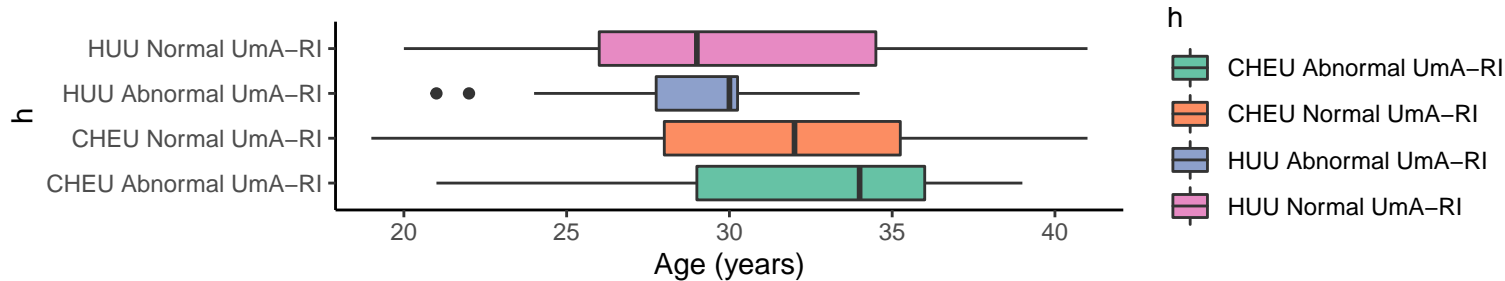
The p-value for MUACZ was: 0.7519 which indicate no significant difference.

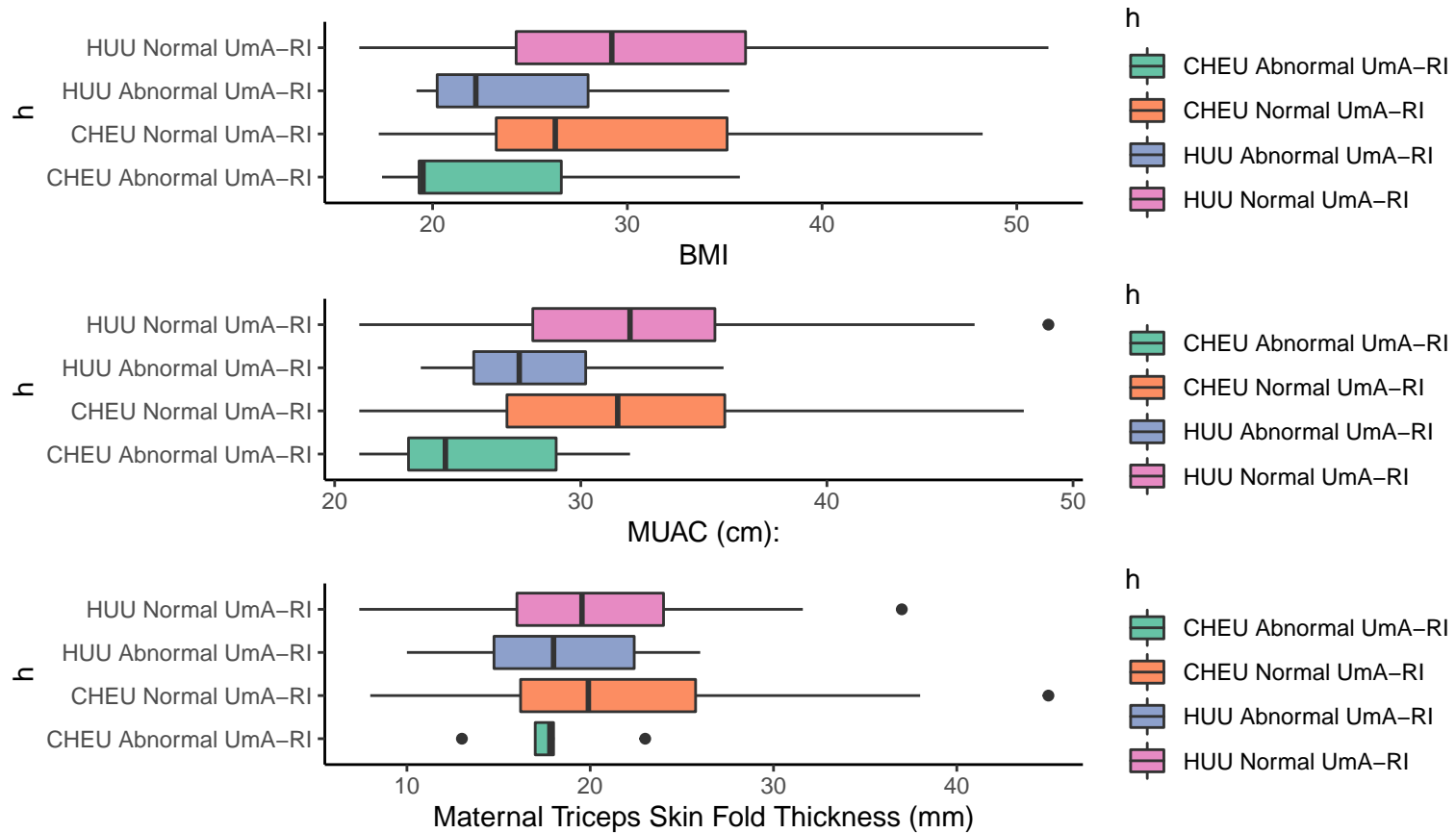
The p-value for TSFZ was: 0.551 which indicate no significant difference.

1.3 Maternal-Anthro Dataset

	DataA (N = 232)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 48)	HUU Abnormal UmA-RI (N = 12)	HUU Normal UmA-RI (N = 167)
UmbiBaby Group					
Missing Values	0	0	0	0	0
HR-PEDF	17 (7.3%)	5 (100.0%)	0 (0.0%)	12 (100.0%)	0 (0.0%)
LR-FT	215 (92.7%)	0 (0.0%)	48 (100.0%)	0 (0.0%)	167 (100.0%)
LR-Prem	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Maternal HIV status:					
Missing Values	0	0	0	0	0
Positive	53 (22.8%)	5 (100.0%)	48 (100.0%)	0 (0.0%)	0 (0.0%)
Negative	179 (77.2%)	0 (0.0%)	0 (0.0%)	12 (100.0%)	167 (100.0%)
h					
Missing Values	0	0	0	0	0
HUU Normal UmA-RI	167 (72.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	167 (100.0%)
HUU Abnormal UmA-RI	12 (5.2%)	0 (0.0%)	0 (0.0%)	12 (100.0%)	0 (0.0%)
CHEU Normal UmA-RI	48 (20.7%)	0 (0.0%)	48 (100.0%)	0 (0.0%)	0 (0.0%)
CHEU Abnormal UmA-RI	5 (2.2%)	5 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Age in Years					
Missing Values	0	0	0	0	0
min	19	21	19	21	20
max	41	39	41	34	41
mean (sd)	30.29 \pm 5.23	31.80 \pm 7.05	31.40 \pm 5.49	28.58 \pm 4.03	30.05 \pm 5.16
median (iqr)	30.00 (26.00, 35.00)	34.00 (29.00, 36.00)	32.00 (28.00, 35.25)	30.00 (27.75, 30.25)	29.00 (26.00, 34.50)
mean (CI)	30.29 (95% CI: 29.62, 30.96)	31.80 (95% CI: 25.62, 37.98)	31.40 (95% CI: 29.84, 32.95)	28.58 (95% CI: 26.30, 30.87)	30.05 (95% CI: 29.27, 30.83)
Weight (kg)					
Missing Values	0	0	0	0	0
min	39.3	44	39.3	46.8	44.2
max	133.2	103.4	131.4	90.2	133.2
mean (sd)	76.59 \pm 21.10	62.24 \pm 24.59	76.53 \pm 24.22	61.42 \pm 15.07	78.13 \pm 19.96
median (iqr)	73.25 (60.15, 91.53)	48.70 (48.50, 66.60)	72.25 (59.85, 91.67)	54.10 (51.35, 68.75)	74.60 (63.15, 91.83)
mean (CI)	76.59 (95% CI: 73.88, 79.31)	62.24 (95% CI: 40.69, 83.79)	76.53 (95% CI: 69.67, 83.38)	61.42 (95% CI: 52.90, 69.95)	78.13 (95% CI: 75.11, 81.16)
Height (cm)					
Missing Values	0	0	0	0	0
min	145.4	158	146	152	145.4
max	187	170	187	165	174.9
mean (sd)	160.23 \pm 6.55	160.74 \pm 5.19	161.03 \pm 8.87	157.77 \pm 4.58	160.16 \pm 5.90
median (iqr)	159.15 (155.50, 165.00)	158.50 (158.20, 159.00)	161.00 (153.88, 166.50)	156.75 (153.75, 160.75)	159.20 (156.00, 164.95)

	DataA (N = 232)	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 48)	HUU Abnormal UmA-RI (N = 12)	HUU Normal UmA-RI (N = 167)
mean (CI)	160.23 (95% CI: 159.38, 161.07)	160.74 (95% CI: 156.19, 165.29)	161.03 (95% CI: 158.52, 163.54)	157.77 (95% CI: 155.17, 160.36)	160.16 (95% CI: 159.26, 161.05)
Height (m)					
Missing Values	0	0	0	0	0
min	1.454	1.58	1.46	1.52	1.454
max	1.87	1.7	1.87	1.65	1.749
mean (sd)	1.60 \pm 0.07	1.61 \pm 0.05	1.61 \pm 0.09	1.58 \pm 0.05	1.60 \pm 0.06
median (iqr)	1.59 (1.55, 1.65)	1.58 (1.58, 1.59)	1.61 (1.54, 1.67)	1.57 (1.54, 1.61)	1.59 (1.56, 1.65)
mean (CI)	1.60 (95% CI: 1.59, 1.61)	1.61 (95% CI: 1.56, 1.65)	1.61 (95% CI: 1.59, 1.64)	1.58 (95% CI: 1.55, 1.60)	1.60 (95% CI: 1.59, 1.61)
BMI (kg/m²)					
Missing Values	0	0	0	0	0
min	16.2350780532599	17.4043748269451	17.236086136573	19.1735537190083	16.2350780532599
max	51.6238262307756	35.7785467128028	48.2461673394848	35.234375	51.6238262307756
mean (sd)	29.78 \pm 7.87	23.72 \pm 7.60	29.25 \pm 8.28	24.65 \pm 5.79	30.49 \pm 7.72
median (iqr)	28.24 (23.33, 35.71)	19.51 (19.31, 26.61)	26.30 (23.27, 35.12)	22.22 (20.24, 27.99)	29.20 (24.29, 36.07)
mean (CI)	29.78 (95% CI: 28.77, 30.79)	23.72 (95% CI: 17.06, 30.38)	29.25 (95% CI: 26.91, 31.59)	24.65 (95% CI: 21.37, 27.93)	30.49 (95% CI: 29.32, 31.66)
MUAC (cm)					
Missing Values	0	0	0	0	0
min	21	21	21	23.5	21
max	49	32	48	35.8	49
mean (sd)	31.69 \pm 5.29	25.90 \pm 4.51	31.61 \pm 5.77	28.10 \pm 3.86	32.14 \pm 5.09
median (iqr)	31.35 (28.00, 35.05)	24.50 (23.00, 29.00)	31.50 (27.00, 35.85)	27.50 (25.65, 30.20)	32.00 (28.05, 35.45)
mean (CI)	31.69 (95% CI: 31.01, 32.37)	25.90 (95% CI: 21.95, 29.85)	31.61 (95% CI: 29.97, 33.24)	28.10 (95% CI: 25.92, 30.28)	32.14 (95% CI: 31.37, 32.92)
Maternal Triceps Skin Fold Thickness (mm)					
Missing Values	7	0	2	0	5
min	7.4	13	8	10	7.4
max	45	23	45	26	37
mean (sd)	225; 20.09 \pm 5.68	17.76 \pm 3.56	46; 21.19 \pm 7.37	18.28 \pm 4.97	162; 19.99 \pm 5.19
median (iqr)	225; 19.10 (16.00, 24.00)	17.80 (17.00, 18.00)	46; 19.90 (16.20, 25.75)	18.00 (14.75, 22.40)	162; 19.55 (16.00, 24.00)
mean (CI)	20.09 (95% CI: 19.35, 20.84)	17.76 (95% CI: 14.64, 20.88)	21.19 (95% CI: 19.06, 23.32)	18.28 (95% CI: 15.47, 21.09)	19.99 (95% CI: 19.19, 20.79)





1.3.1 Additional investigation - Comparing against baseline group

The following investigation will compare each of the three groups against our baseline (normal group) in order to determine if significant differences exist. In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the independent t-test was used to compare the groups while the Mann Whitney U tests were used in the non-normal cases. All tests were performed at a 5% level of significance.

1.3.1.1 HUU Normal vs HUU Abnormal The p-value for Weight was: 0.003 * which indicates a significant difference.

The p-value for Height was: 0.11 which indicates no significant difference.

The p-value for BMI was: 0.0064 * which indicates a significant difference.

The p-value for MUAC was: 0.0041 * which indicates a significant difference.

The p-value for Maternal Triceps Skin Fold Thickness was: 0.2732 which indicates no significant difference.

1.3.1.2 HUU Normal vs HEU Normal The p-value for Weight was: 0.4945 which indicate no significant difference.

The p-value for Height was: 0.5234 which indicate no significant difference.

The p-value for BMI was: 0.2505 which indicate no significant difference.

The p-value for MUAC was: 0.5609 which indicate no significant difference.

The p-value for Maternal Triceps Skin Fold Thickness was: 0.3065 which indicate no significant difference.

1.3.1.3 HUU Normal vs HEU Abnormal The p-value for Weight was: 0.067 which indicate no significant difference.

The p-value for Height was: 0.8162 which indicate no significant difference.

The p-value for BMI was: 0.043 * which indicate a significant difference.

The p-value for MUAC was: 0.0348 * which indicate a significant difference.

The p-value for Maternal Triceps Skin Fold Thickness was: 0.2387 which indicate no significant difference.

1.3.2 Additional investigation - Comparing characteristics between all 4 groups

For all the numerical variables: In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the one way ANOVA was used to compare the groups while the Kruskal Wallis H test was used in the non-normal cases. All tests were performed at a 5% level of significance.

The p-value for Age was: 0.2125 which indicate no significant difference.

The p-value for Weight was: 0.0095 * which indicate a significant difference.

The p-value for Height was: 0.5641 which indicate no significant difference.

The p-value for BMI was: 0.0084 * which indicate a significant difference.

The p-value for MUAC was: 0.0047 * which indicate a significant difference.

The p-value for Maternal Triceps Skin Fold Thickness (mm) was: 0.2826 which indicate no significant difference.

For each of the variables which were significantly different, we continue to perform a posthoc analysis to determine which groups differs from which. We always use the adjusted p-values as we included a Bonferonni correction.

Weight

Comparison	Z	P.unadj	P.adj
CHEU Abnormal UmA-RI - CHEU Normal UmA-RI	-1.557	0.1195	0.1793
CHEU Abnormal UmA-RI - HUU Abnormal UmA-RI	0.02869	0.9771	0.9771
CHEU Normal UmA-RI - HUU Abnormal UmA-RI	2.314	0.02067	0.062
CHEU Abnormal UmA-RI - HUU Normal UmA-RI	-1.87	0.06154	0.1231
CHEU Normal UmA-RI - HUU Normal UmA-RI	-0.7142	0.4751	0.5701
HUU Abnormal UmA-RI - HUU Normal UmA-RI	-2.89	0.003849	0.02309

BMI

Comparison	Z	P.unadj	P.adj
CHEU Abnormal UmA-RI - CHEU Normal UmA-RI	-1.61	0.1075	0.1612
CHEU Abnormal UmA-RI - HUU Abnormal UmA-RI	-0.2403	0.8101	0.8101
CHEU Normal UmA-RI - HUU Abnormal UmA-RI	1.948	0.05147	0.1029
CHEU Abnormal UmA-RI - HUU Normal UmA-RI	-2.077	0.03776	0.1133
CHEU Normal UmA-RI - HUU Normal UmA-RI	-1.138	0.2551	0.3061
HUU Abnormal UmA-RI - HUU Normal UmA-RI	-2.727	0.006394	0.03836

MAUC

- h:

	diff	lwr	upr	p adj
CHEU Normal UmA-RI-CHEU Abnormal UmA-RI	5.706	-0.5933	12.01	0.09119
HUU Abnormal UmA-RI-CHEU Abnormal UmA-RI	2.2	-4.936	9.336	0.8553
HUU Normal UmA-RI-CHEU Abnormal UmA-RI	6.245	0.1607	12.33	0.04177
HUU Abnormal UmA-RI-CHEU Normal UmA-RI	-3.506	-7.833	0.8203	0.157
HUU Normal UmA-RI-CHEU Normal UmA-RI	0.5387	-1.657	2.734	0.9206
HUU Normal UmA-RI-HUU Abnormal UmA-RI	4.045	0.03848	8.051	0.04686

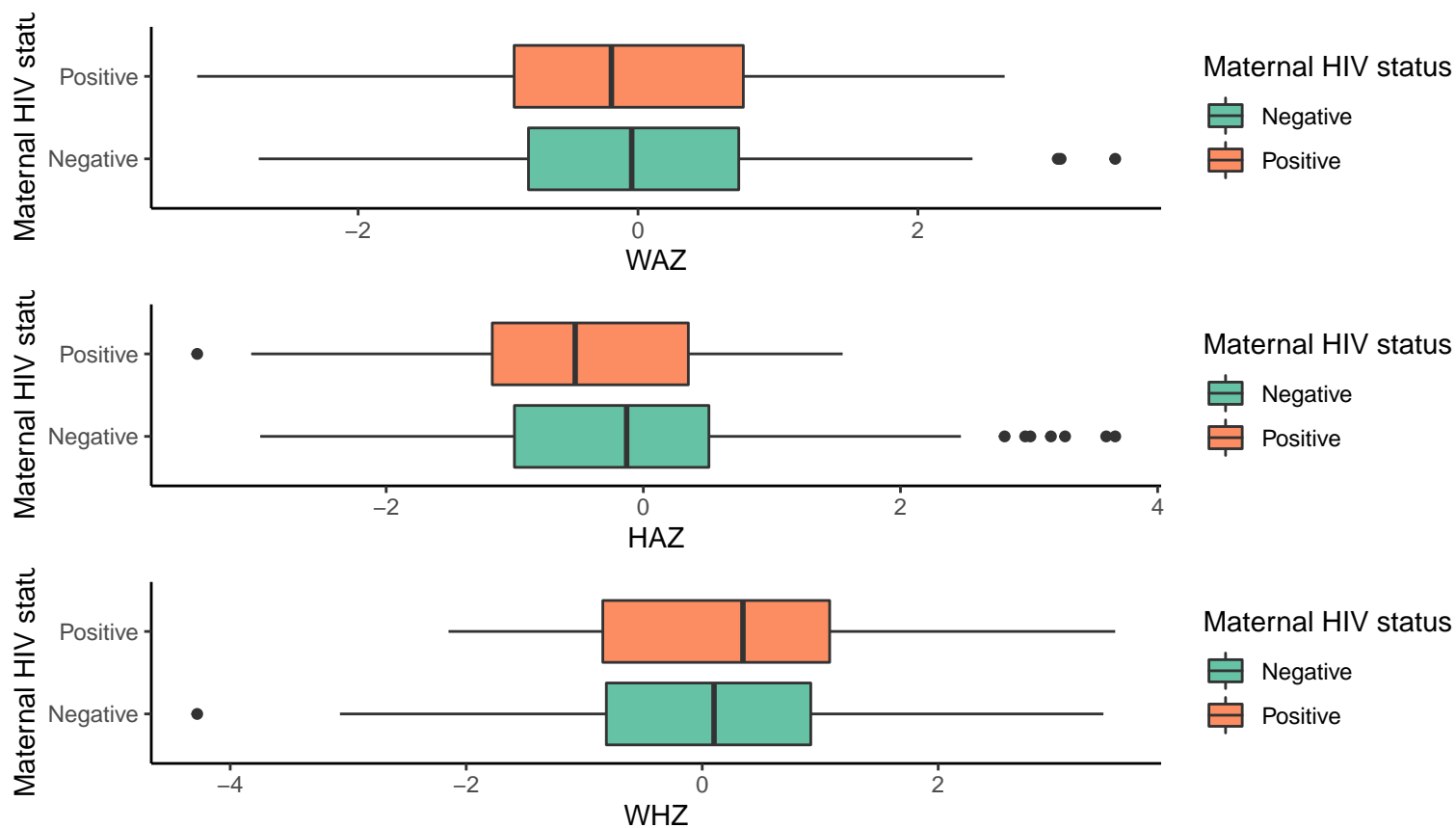
2 Additional investigations

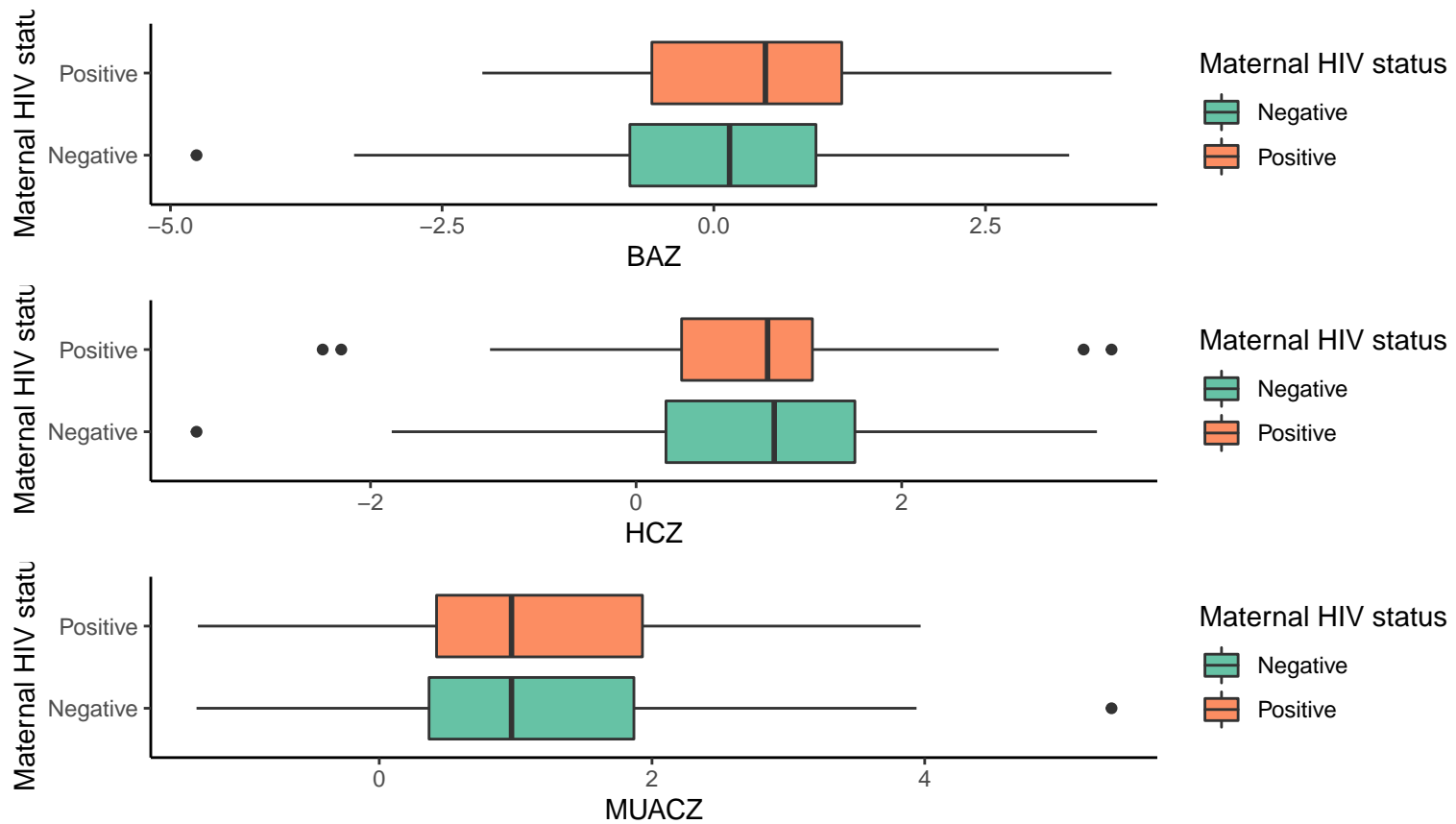
2.1 Compare child growth measures between HIV exposure

In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the independent t-test was used to compare the groups while the Mann Whitney U tests was used in the non-normal cases. All tests were performed at a 5% level of significance.

	DataA (N = 238)	Negative (N = 184)	Positive (N = 54)
WAZ			
Missing Values	0	0	0
min	-3.15	-2.71	-3.15
max	3.41	3.41	2.62
mean (sd)	-0.02 \pm 1.18	0.01 \pm 1.15	-0.09 \pm 1.29
median (iqr)	-0.06 (-0.82, 0.72)	-0.04 (-0.78, 0.72)	-0.19 (-0.89, 0.75)
mean (CI)	-0.02 (95% CI: -0.17, 0.13)	0.01 (95% CI: -0.16, 0.17)	-0.09 (95% CI: -0.43, 0.26)
HAZ			
Missing Values	0	0	0
min	-3.47	-2.98	-3.47
max	3.67	3.67	1.55
mean (sd)	-0.23 \pm 1.29	-0.12 \pm 1.30	-0.60 \pm 1.19
median (iqr)	-0.20 (-1.06, 0.44)	-0.13 (-1.00, 0.51)	-0.53 (-1.18, 0.35)
mean (CI)	-0.23 (95% CI: -0.39, -0.06)	-0.12 (95% CI: -0.30, 0.07)	-0.60 (95% CI: -0.92, -0.28)
WHZ			
Missing Values	0	0	0
min	-4.28	-4.28	-2.15
max	3.5	3.4	3.5
mean (sd)	0.12 \pm 1.23	0.07 \pm 1.18	0.26 \pm 1.37
median (iqr)	0.15 (-0.82, 0.97)	0.10 (-0.81, 0.92)	0.34 (-0.84, 1.08)
mean (CI)	0.12 (95% CI: -0.04, 0.27)	0.07 (95% CI: -0.10, 0.24)	0.26 (95% CI: -0.11, 0.62)
BAZ			
Missing Values	0	0	0
min	-4.76	-4.76	-2.13
max	3.66	3.27	3.66
mean (sd)	0.18 \pm 1.25	0.12 \pm 1.21	0.38 \pm 1.38
median (iqr)	0.22 (-0.76, 0.97)	0.15 (-0.77, 0.94)	0.47 (-0.57, 1.18)
mean (CI)	0.18 (95% CI: 0.02, 0.33)	0.12 (95% CI: -0.06, 0.29)	0.38 (95% CI: 0.01, 0.74)
HCZ			
Missing Values	6	6	0
min	-3.31	-3.31	-2.36
max	3.58	3.47	3.58
mean (sd)	232; 0.86 \pm 1.17	178; 0.88 \pm 1.16	0.82 \pm 1.22
median (iqr)	232; 1.04 (0.24, 1.63)	178; 1.04 (0.23, 1.65)	0.99 (0.34, 1.33)
mean (CI)	0.86 (95% CI: 0.71, 1.01)	0.88 (95% CI: 0.71, 1.05)	0.82 (95% CI: 0.49, 1.14)

	DataA (N = 238)	Negative (N = 184)	Positive (N = 54)
MUACZ			
Missing Values	1	0	1
min	-1.34	-1.34	-1.33
max	5.37	5.37	3.97
mean (sd)	237; 1.09 ± 1.13	1.06 ± 1.10	53; 1.19 ± 1.22
median (iqr)	237; 0.97 (0.39, 1.90)	0.97 (0.37, 1.87)	53; 0.97 (0.42, 1.93)
mean (CI)	1.09 (95% CI: 0.94, 1.23)	1.06 (95% CI: 0.90, 1.22)	1.19 (95% CI: 0.86, 1.52)





The p-value for WAZ was: 0.636 which indicate no significant difference.

The p-value for HAZ was: 0.0641 which indicate no significant difference.

The p-value for WHZ was: 0.3716 which indicate no significant difference.

The p-value for BAZ was: 0.2099 which indicate no significant difference.

The p-value for HCZ was: 0.7468 which indicate no significant difference.

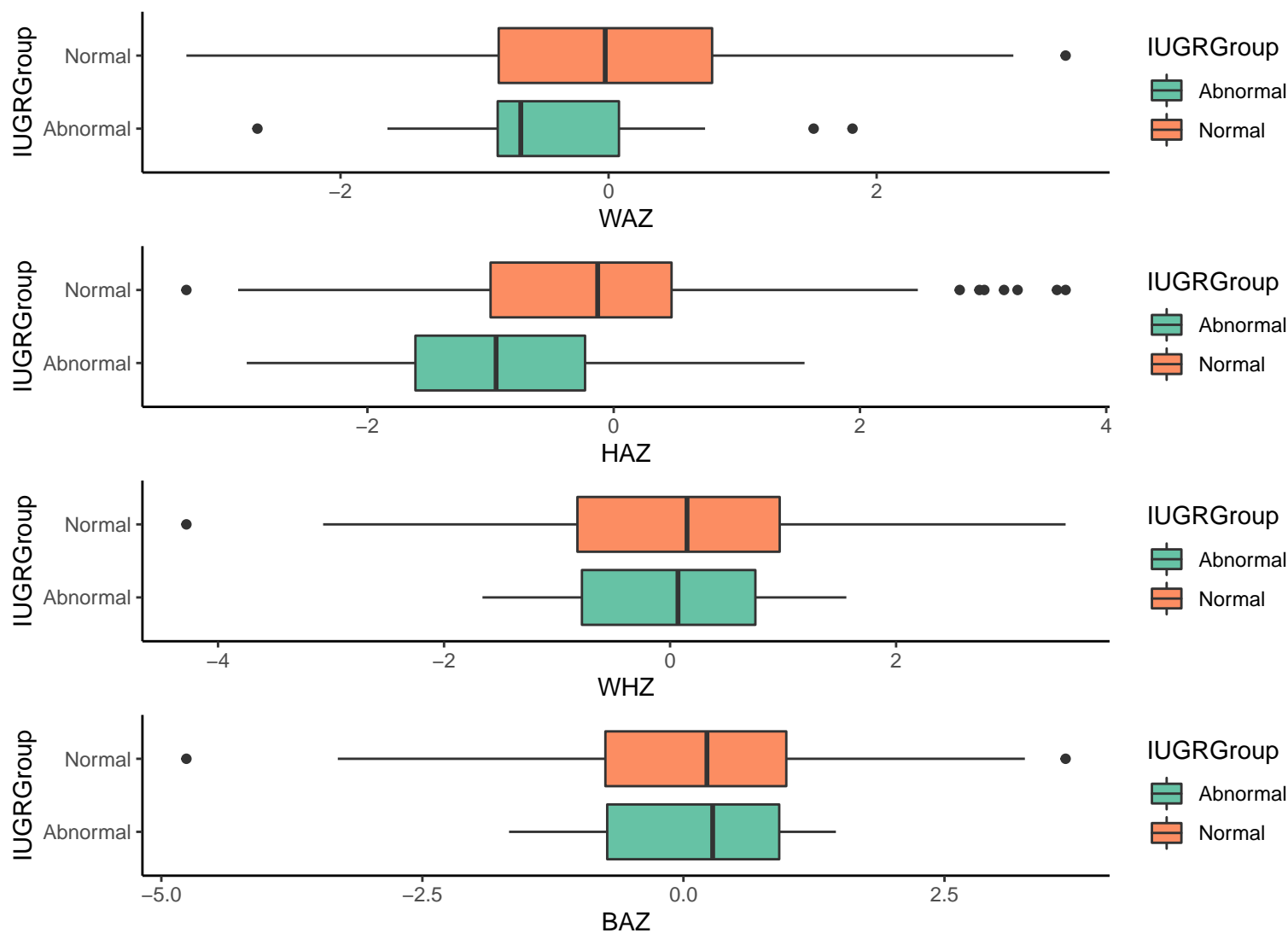
The p-value for MUACZ was: 0.5643 which indicate no significant difference.

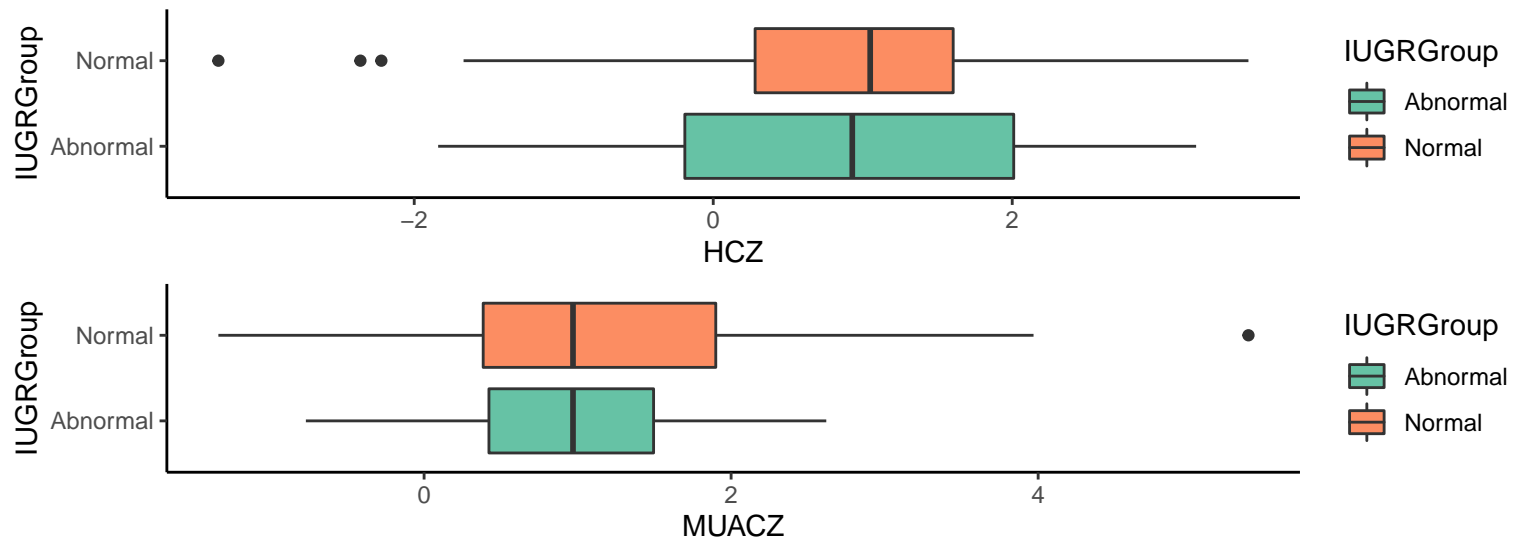
2.2 Compare child growth measures between IUGR

In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the independent t-test was used to compare the groups while the Mann Whitney U tests was used in the non-normal cases. All tests were performed at a 5% level of significance.

	DataA (N = 238)	Abnormal (N = 18)	Normal (N = 220)
WAZ			
Missing Values	0	0	0
min	-3.15	-2.62	-3.15
max	3.41	1.82	3.41
mean (sd)	-0.02 \pm 1.18	-0.43 \pm 1.10	0.02 \pm 1.18
median (iqr)	-0.06 (-0.82, 0.72)	-0.66 (-0.83, 0.08)	-0.03 (-0.82, 0.77)
mean (CI)	-0.02 (95% CI: -0.17, 0.13)	-0.43 (95% CI: -0.94, 0.07)	0.02 (95% CI: -0.14, 0.17)
HAZ			
Missing Values	0	0	0
min	-3.47	-2.98	-3.47
max	3.67	1.55	3.67
mean (sd)	-0.23 \pm 1.29	-0.84 \pm 1.26	-0.18 \pm 1.28
median (iqr)	-0.20 (-1.06, 0.44)	-0.96 (-1.61, -0.23)	-0.13 (-1.00, 0.47)
mean (CI)	-0.23 (95% CI: -0.39, -0.06)	-0.84 (95% CI: -1.42, -0.26)	-0.18 (95% CI: -0.34, -0.01)
WHZ			
Missing Values	0	0	0
min	-4.28	-1.66	-4.28
max	3.5	1.56	3.5
mean (sd)	0.12 \pm 1.23	-0.05 \pm 0.98	0.13 \pm 1.25
median (iqr)	0.15 (-0.82, 0.97)	0.07 (-0.78, 0.76)	0.15 (-0.82, 0.97)
mean (CI)	0.12 (95% CI: -0.04, 0.27)	-0.05 (95% CI: -0.51, 0.40)	0.13 (95% CI: -0.04, 0.29)
BAZ			
Missing Values	0	0	0
min	-4.76	-1.67	-4.76
max	3.66	1.46	3.66
mean (sd)	0.18 \pm 1.25	0.12 \pm 0.98	0.18 \pm 1.27
median (iqr)	0.22 (-0.76, 0.97)	0.28 (-0.73, 0.92)	0.22 (-0.75, 0.99)
mean (CI)	0.18 (95% CI: 0.02, 0.33)	0.12 (95% CI: -0.34, 0.57)	0.18 (95% CI: 0.01, 0.35)
HCZ			
Missing Values	6	1	5
min	-3.31	-1.84	-3.31
max	3.58	3.23	3.58
mean (sd)	232; 0.86 \pm 1.17	17; 0.86 \pm 1.42	215; 0.86 \pm 1.15
median (iqr)	232; 1.04 (0.24, 1.63)	17; 0.93 (-0.19, 2.01)	215; 1.05 (0.28, 1.60)
mean (CI)	0.86 (95% CI: 0.71, 1.01)	0.86 (95% CI: 0.19, 1.54)	0.86 (95% CI: 0.71, 1.02)
MUACZ			
Missing Values	1	0	1

	DataA (N = 238)	Abnormal (N = 18)	Normal (N = 220)
min	-1.34	-0.77	-1.34
max	5.37	2.62	5.37
mean (sd)	237; 1.09 ± 1.13	1.03 ± 0.92	219; 1.09 ± 1.15
median (iqr)	237; 0.97 (0.39, 1.90)	0.97 (0.42, 1.50)	219; 0.97 (0.39, 1.90)
mean (CI)	1.09 (95% CI: 0.94, 1.23)	1.03 (95% CI: 0.60, 1.45)	1.09 (95% CI: 0.94, 1.24)





The p-value for WAZ was: 0.636 which indicate no significant difference.

The p-value for HAZ was: 0.0641 which indicate no significant difference.

The p-value for WHZ was: 0.3716 which indicate no significant difference.

The p-value for BAZ was: 0.2099 which indicate no significant difference.

The p-value for HCZ was: 0.7547 which indicate no significant difference.

The p-value for MUACZ was: 0.5643 which indicate no significant difference.

2.3 Compare child growth measures between breastfeeding practices

The overall results of these breastfeeding practices are:

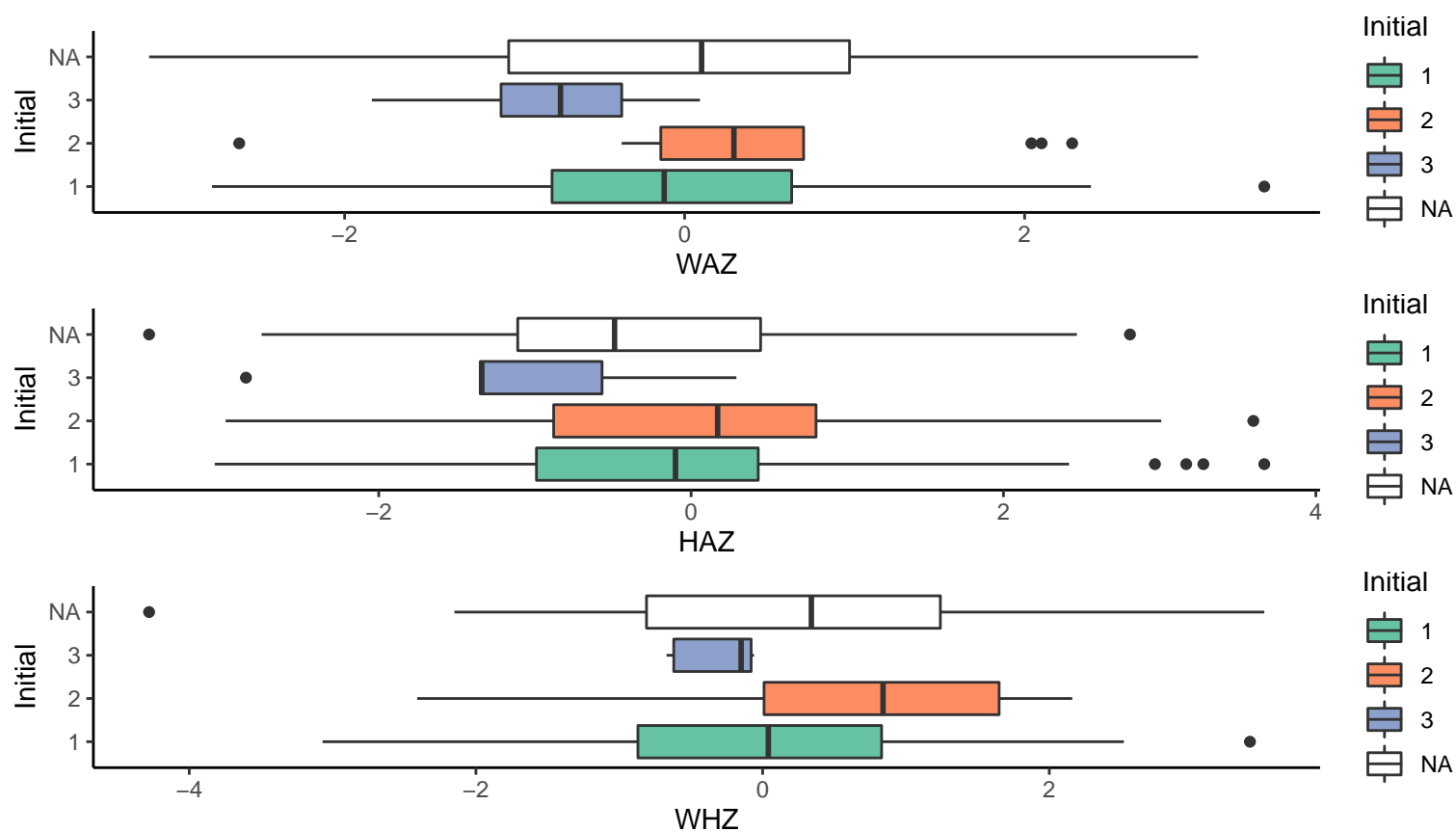
	DataA (N = 238)
Early initiation of breastfeeding	
Missing Values	71
Immediately	149 (89.2%)
Never (baby was fed pumped milk)	13 (7.8%)
Prefer not to answer	5 (3.0%)
Infant feeding from birth until 6 months	
Missing Values	1
Exclusive breastfeeding	155 (65.4%)
Replacement feeding	12 (5.1%)
Mixed feeding	54 (22.8%)
Formula feeding only, but previously exclusive breastfeeding	16 (6.8%)
Supplementary breastfeeding	
Missing Values	0
Yes	50 (21.0%)
No	188 (79.0%)
Baby had any liquids other than breast milk or formula since his/her birth (early introduction of food)	
Missing Values	4
No	83 (35.5%)
Yes	151 (64.5%)

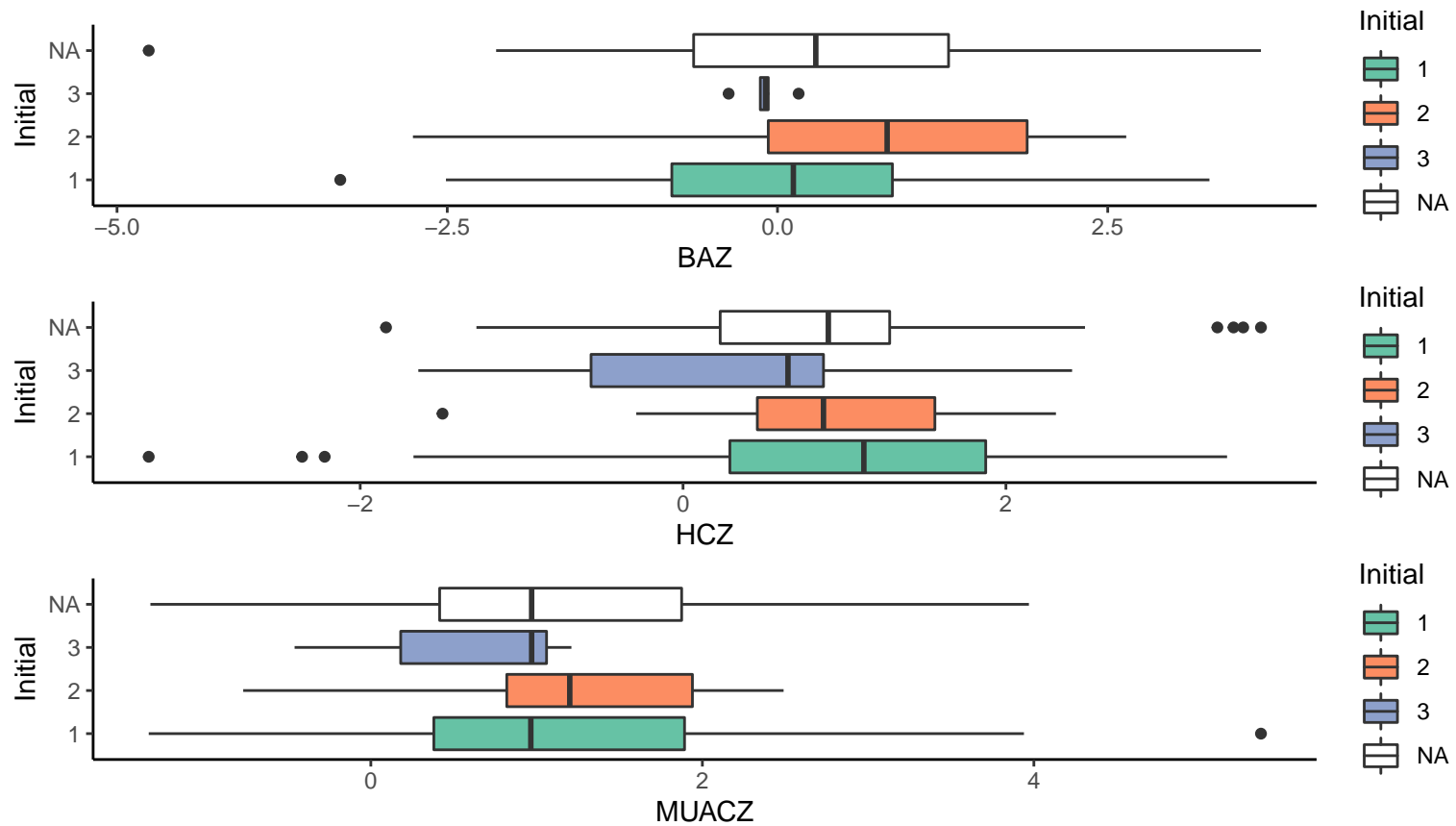
2.3.1 Early initiation of breastfeeding

In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the one way ANOVA was used to compare the groups while the Kruskal Wallis H test was used in the non-normal cases. All tests were performed at a 5% level of significance.

	1 (N = 149)	2 (N = 13)	3 (N = 5)
WAZ			
Missing Values	0	0	0
min	-2.78	-2.62	-1.84
max	3.41	2.28	0.09
mean (sd)	-0.06 ± 1.10	0.44 ± 1.28	-0.79 ± 0.73
median (iqr)	-0.12 (-0.78, 0.63)	0.29 (-0.14, 0.70)	-0.73 (-1.08, -0.37)
mean (CI)	-0.06 (95% CI: -0.23, 0.12)	0.44 (95% CI: -0.26, 1.13)	-0.79 (95% CI: -1.43, -0.14)
HAZ			
Missing Values	0	0	0
min	-3.05	-2.98	-2.85
max	3.67	3.6	0.29
mean (sd)	-0.16 ± 1.24	0.11 ± 1.94	-1.16 ± 1.16
median (iqr)	-0.10 (-0.99, 0.43)	0.17 (-0.88, 0.80)	-1.34 (-1.35, -0.57)
mean (CI)	-0.16 (95% CI: -0.36, 0.04)	0.11 (95% CI: -0.95, 1.17)	-1.16 (95% CI: -2.18, -0.15)
WHZ			
Missing Values	0	0	0
min	-3.07	-2.41	-0.67
max	3.4	2.16	-0.06
mean (sd)	0.02 ± 1.12	0.48 ± 1.43	-0.32 ± 0.30
median (iqr)	0.04 (-0.87, 0.83)	0.84 (0.01, 1.65)	-0.15 (-0.62, -0.08)
mean (CI)	0.02 (95% CI: -0.16, 0.20)	0.48 (95% CI: -0.29, 1.26)	-0.32 (95% CI: -0.58, -0.05)
BAZ			
Missing Values	0	0	0
min	-3.31	-2.76	-0.37
max	3.27	2.64	0.16
mean (sd)	0.07 ± 1.15	0.54 ± 1.52	-0.10 ± 0.19
median (iqr)	0.12 (-0.80, 0.87)	0.83 (-0.07, 1.89)	-0.09 (-0.13, -0.07)
mean (CI)	0.07 (95% CI: -0.12, 0.25)	0.54 (95% CI: -0.29, 1.37)	-0.10 (95% CI: -0.27, 0.07)
HCZ			
Missing Values	6	0	0
min	-3.31	-1.49	-1.64
max	3.37	2.31	2.41
mean (sd)	143; 0.93 ± 1.20	0.82 ± 1.01	0.34 ± 1.53
median (iqr)	143; 1.12 (0.29, 1.88)	0.87 (0.46, 1.56)	0.65 (-0.57, 0.87)
mean (CI)	0.93 (95% CI: 0.73, 1.13)	0.82 (95% CI: 0.27, 1.37)	0.34 (95% CI: -1.00, 1.69)
MUACZ			
Missing Values	1	0	0

	1 (N = 149)	2 (N = 13)	3 (N = 5)
min	-1.34	-0.77	-0.46
max	5.37	2.49	1.21
mean (sd)	148; 1.08 ± 1.16	1.21 ± 1.03	0.59 ± 0.71
median (iqr)	148; 0.96 (0.38, 1.89)	1.20 (0.82, 1.94)	0.97 (0.18, 1.06)
mean (CI)	1.08 (95% CI: 0.89, 1.26)	1.21 (95% CI: 0.65, 1.76)	0.59 (95% CI: -0.03, 1.21)





The p-value for WAZ was: 0.0971 which indicate no significant difference.

The p-value for HAZ was: 0.2101 which indicate no significant difference.

The p-value for WHZ was: 0.284 which indicate no significant difference.

The p-value for BAZ was: 0.3442 which indicate no significant difference.

The p-value for HCZ was: 0.6053 which indicate no significant difference.

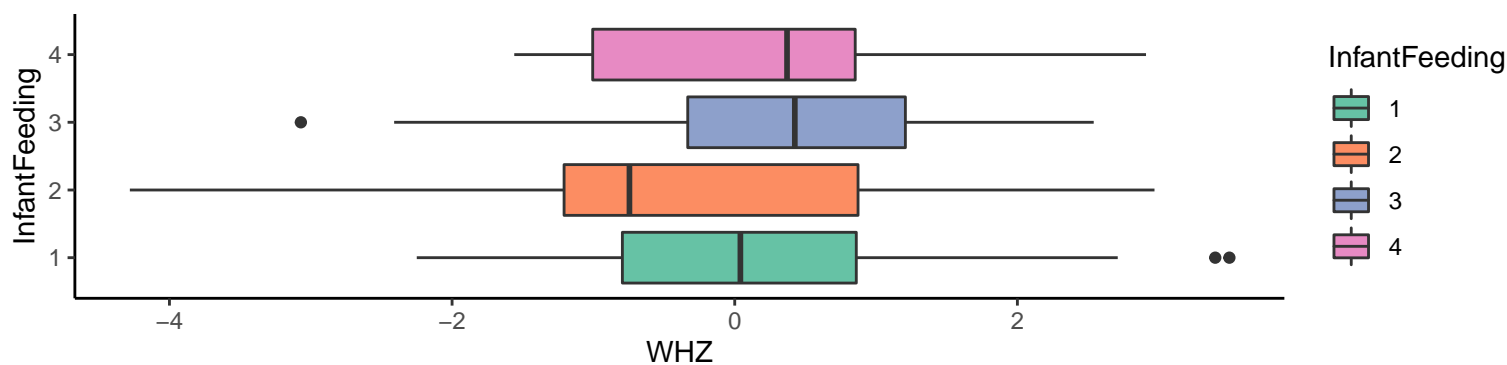
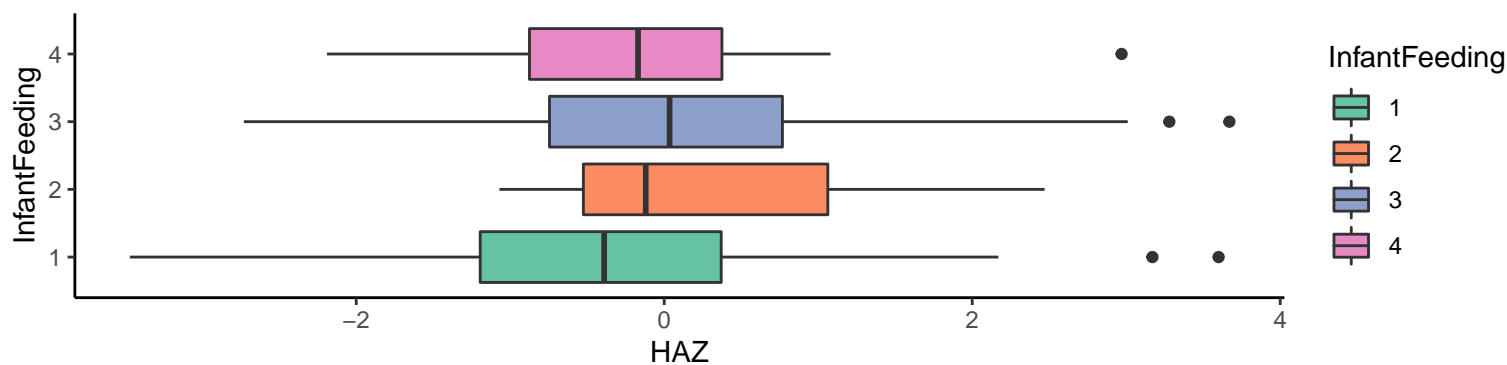
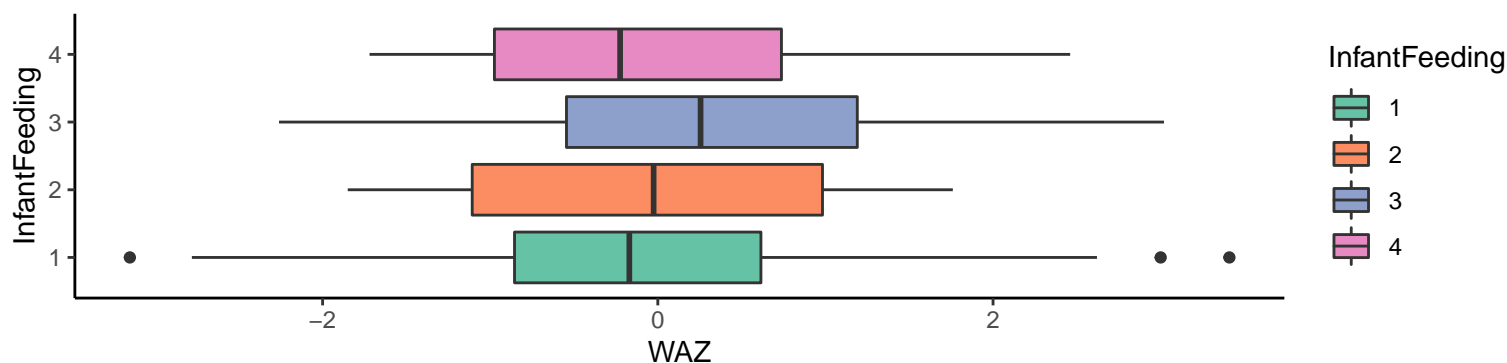
The p-value for MUACZ was: 0.5587 which indicate no significant difference.

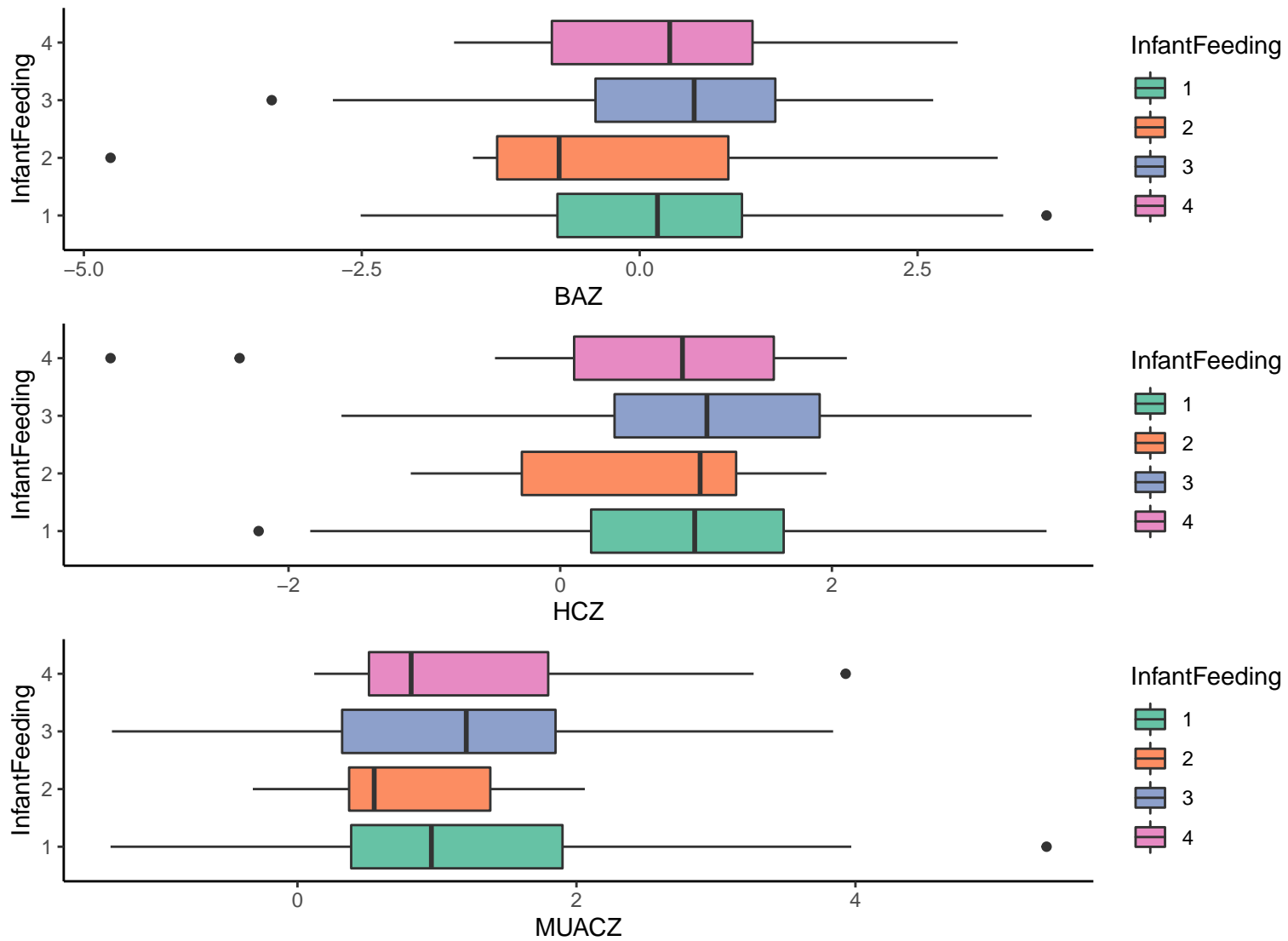
2.3.2 How did you feed your baby from birth until 6 months

In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the one way ANOVA was used to compare the groups while the Kruskal Wallis H test was used in the non-normal cases. All tests were performed at a 5% level of significance.

	1 (N = 155)	2 (N = 12)	3 (N = 54)	4 (N = 16)
WAZ				
Missing Values	0	0	0	0
min	-3.15	-1.85	-2.26	-1.72
max	3.41	1.76	3.02	2.46
mean (sd)	-0.12 \pm 1.17	-0.04 \pm 1.23	0.29 \pm 1.17	0.00 \pm 1.20
median (iqr)	-0.17 (-0.85, 0.61)	-0.03 (-1.11, 0.98)	0.26 (-0.55, 1.19)	-0.22 (-0.98, 0.74)
mean (CI)	-0.12 (95% CI: -0.30, 0.06)	-0.04 (95% CI: -0.74, 0.66)	0.29 (95% CI: -0.03, 0.60)	0.00 (95% CI: -0.58, 0.59)
HAZ				
Missing Values	0	0	0	0
min	-3.47	-1.07	-2.73	-2.19
max	3.6	2.47	3.67	2.97
mean (sd)	-0.38 \pm 1.24	0.36 \pm 1.25	0.08 \pm 1.41	-0.23 \pm 1.24
median (iqr)	-0.39 (-1.19, 0.37)	-0.12 (-0.53, 1.06)	0.04 (-0.74, 0.77)	-0.17 (-0.88, 0.38)
mean (CI)	-0.38 (95% CI: -0.57, -0.18)	0.36 (95% CI: -0.35, 1.07)	0.08 (95% CI: -0.29, 0.46)	-0.23 (95% CI: -0.84, 0.37)
WHZ				
Missing Values	0	0	0	0
min	-2.25	-4.28	-3.07	-1.56
max	3.5	2.97	2.54	2.91
mean (sd)	0.08 \pm 1.16	-0.33 \pm 1.88	0.32 \pm 1.26	0.14 \pm 1.25
median (iqr)	0.04 (-0.80, 0.86)	-0.74 (-1.21, 0.87)	0.43 (-0.33, 1.21)	0.37 (-1.00, 0.85)
mean (CI)	0.08 (95% CI: -0.11, 0.26)	-0.33 (95% CI: -1.39, 0.74)	0.32 (95% CI: -0.02, 0.65)	0.14 (95% CI: -0.47, 0.76)
BAZ				
Missing Values	0	0	0	0
min	-2.51	-4.76	-3.31	-1.67
max	3.66	3.22	2.64	2.86
mean (sd)	0.16 \pm 1.15	-0.38 \pm 2.03	0.34 \pm 1.31	0.20 \pm 1.28
median (iqr)	0.16 (-0.74, 0.92)	-0.72 (-1.28, 0.80)	0.49 (-0.40, 1.22)	0.27 (-0.79, 1.01)
mean (CI)	0.16 (95% CI: -0.02, 0.34)	-0.38 (95% CI: -1.53, 0.77)	0.34 (95% CI: -0.01, 0.69)	0.20 (95% CI: -0.43, 0.83)
HCZ				
Missing Values	5	0	1	0
min	-2.22	-1.1	-1.61	-3.31
max	3.58	1.96	3.47	2.11
mean (sd)	150; 0.87 \pm 1.16	0.67 \pm 0.96	53; 1.02 \pm 1.07	0.52 \pm 1.54
median (iqr)	150; 0.99 (0.23, 1.64)	1.03 (-0.28, 1.29)	53; 1.08 (0.40, 1.91)	0.90 (0.10, 1.57)
mean (CI)	0.87 (95% CI: 0.69, 1.06)	0.67 (95% CI: 0.13, 1.22)	1.02 (95% CI: 0.74, 1.31)	0.52 (95% CI: -0.23, 1.28)
MUACZ				
Missing Values	0	0	1	0

	1 (N = 155)	2 (N = 12)	3 (N = 54)	4 (N = 16)
min	-1.34	-0.32	-1.33	0.12
max	5.37	2.06	3.84	3.93
mean (sd)	1.08 ± 1.14	0.82 ± 0.78	53; 1.11 ± 1.16	1.27 ± 1.15
median (iqr)	0.96 (0.39, 1.90)	0.55 (0.37, 1.38)	53; 1.21 (0.32, 1.85)	0.81 (0.51, 1.80)
mean (CI)	1.08 (95% CI: 0.90, 1.26)	0.82 (95% CI: 0.37, 1.26)	1.11 (95% CI: 0.80, 1.43)	1.27 (95% CI: 0.71, 1.83)





The p-value for WAZ was: 0.1946 which indicate no significant difference.

The p-value for HAZ was: 0.0516 which indicate no significant difference.

The p-value for WHZ was: 0.3722 which indicate no significant difference.

The p-value for BAZ was: 0.3466 which indicate no significant difference.

The p-value for HCZ was: 0.7429 which indicate no significant difference.

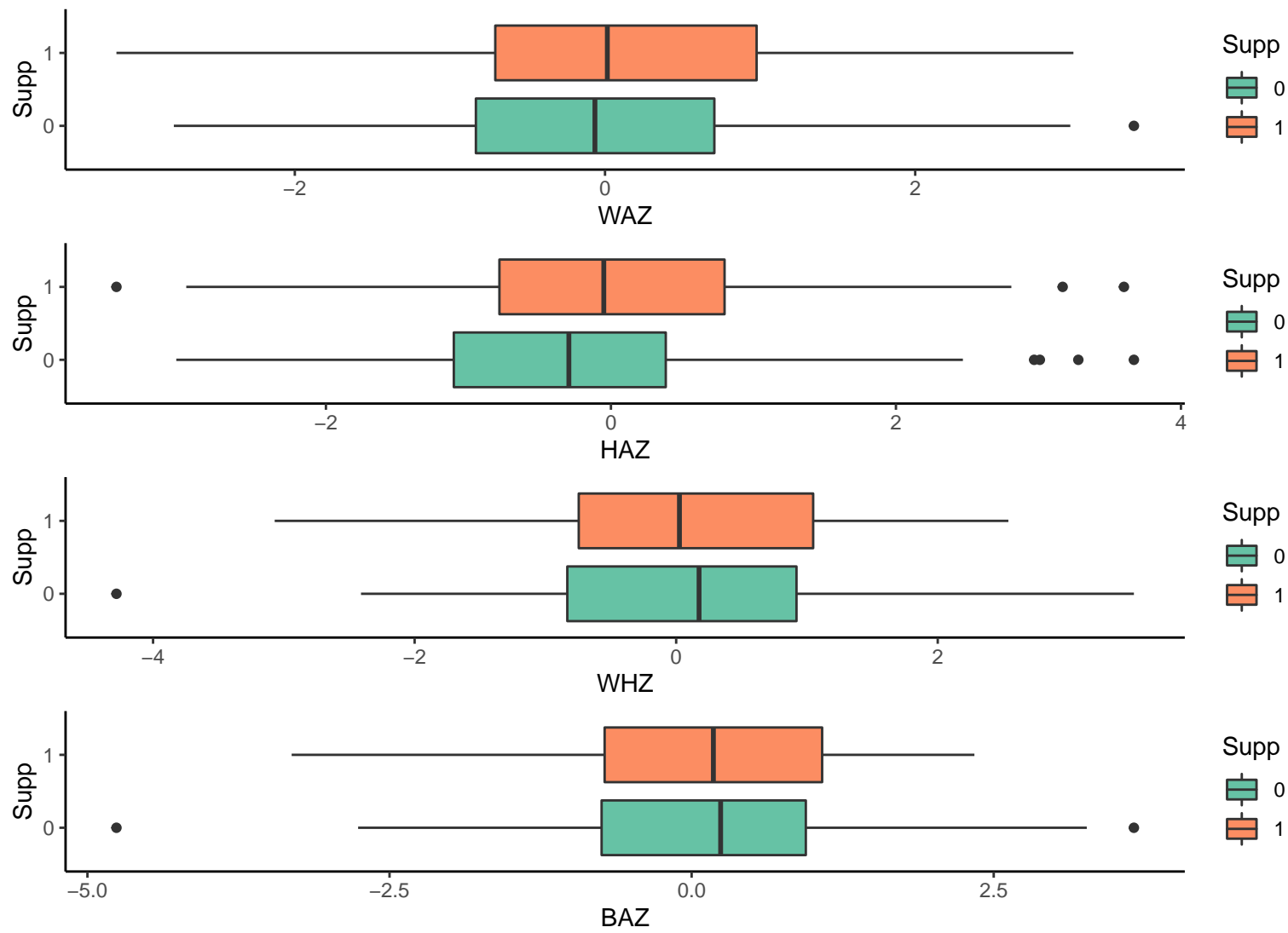
The p-value for MUACZ was: 0.772 which indicate no significant difference.

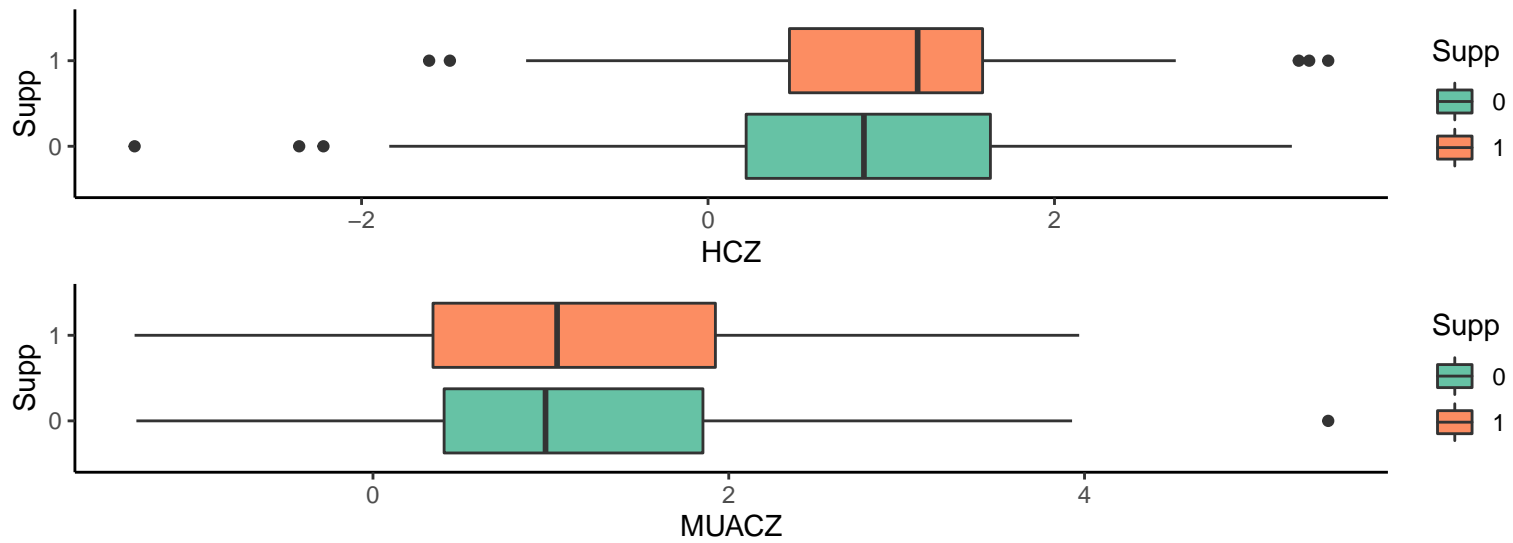
2.3.3 Supplementary breastfeeding

In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the independent t-test was used to compare the groups while the Mann Whitney U tests was used in the non-normal cases. All tests were performed at a 5% level of significance.

	DataA (N = 238)	0 (N = 188)	1 (N = 50)
WAZ			
Missing Values	0	0	0
min	-3.15	-2.78	-3.15
max	3.41	3.41	3.02
mean (sd)	-0.02 ± 1.18	-0.04 ± 1.14	0.06 ± 1.32
median (iqr)	-0.06 (-0.82, 0.72)	-0.07 (-0.83, 0.70)	0.01 (-0.71, 0.98)
mean (CI)	-0.02 (95% CI: -0.17, 0.13)	-0.04 (95% CI: -0.20, 0.13)	0.06 (95% CI: -0.31, 0.42)
HAZ			
Missing Values	0	0	0
min	-3.47	-3.05	-3.47
max	3.67	3.67	3.6
mean (sd)	-0.23 ± 1.29	-0.28 ± 1.24	-0.04 ± 1.47
median (iqr)	-0.20 (-1.06, 0.44)	-0.30 (-1.10, 0.39)	-0.05 (-0.78, 0.80)
mean (CI)	-0.23 (95% CI: -0.39, -0.06)	-0.28 (95% CI: -0.45, -0.10)	-0.04 (95% CI: -0.44, 0.37)
WHZ			
Missing Values	0	0	0
min	-4.28	-4.28	-3.07
max	3.5	3.5	2.54
mean (sd)	0.12 ± 1.23	0.12 ± 1.23	0.10 ± 1.23
median (iqr)	0.15 (-0.82, 0.97)	0.17 (-0.83, 0.92)	0.03 (-0.74, 1.05)
mean (CI)	0.12 (95% CI: -0.04, 0.27)	0.12 (95% CI: -0.06, 0.29)	0.10 (95% CI: -0.24, 0.44)
BAZ			
Missing Values	0	0	0
min	-4.76	-4.76	-3.31
max	3.66	3.66	2.34
mean (sd)	0.18 ± 1.25	0.19 ± 1.26	0.13 ± 1.23
median (iqr)	0.22 (-0.76, 0.97)	0.24 (-0.74, 0.94)	0.18 (-0.72, 1.08)
mean (CI)	0.18 (95% CI: 0.02, 0.33)	0.19 (95% CI: 0.01, 0.37)	0.13 (95% CI: -0.21, 0.47)
HCZ			
Missing Values	6	3	3
min	-3.31	-3.31	-1.61
max	3.58	3.37	3.58
mean (sd)	232; 0.86 ± 1.17	185; 0.81 ± 1.17	47; 1.08 ± 1.15
median (iqr)	232; 1.04 (0.24, 1.63)	185; 0.90 (0.22, 1.63)	47; 1.21 (0.47, 1.58)
mean (CI)	0.86 (95% CI: 0.71, 1.01)	0.81 (95% CI: 0.64, 0.98)	1.08 (95% CI: 0.75, 1.41)
MUACZ			
Missing Values	1	1	0

	DataA (N = 238)	0 (N = 188)	1 (N = 50)
min	-1.34	-1.33	-1.34
max	5.37	5.37	3.97
mean (sd)	237; 1.09 ± 1.13	187; 1.07 ± 1.09	1.14 ± 1.29
median (iqr)	237; 0.97 (0.39, 1.90)	187; 0.97 (0.40, 1.85)	1.04 (0.34, 1.93)
mean (CI)	1.09 (95% CI: 0.94, 1.23)	1.07 (95% CI: 0.92, 1.23)	1.14 (95% CI: 0.79, 1.50)





The p-value for WAZ was: 0.6446 which indicate no significant difference.

The p-value for HAZ was: 0.2502 which indicate no significant difference.

The p-value for WHZ was: 0.9279 which indicate no significant difference.

The p-value for BAZ was: 0.7803 which indicate no significant difference.

The p-value for HCZ was: 0.1988 which indicate no significant difference.

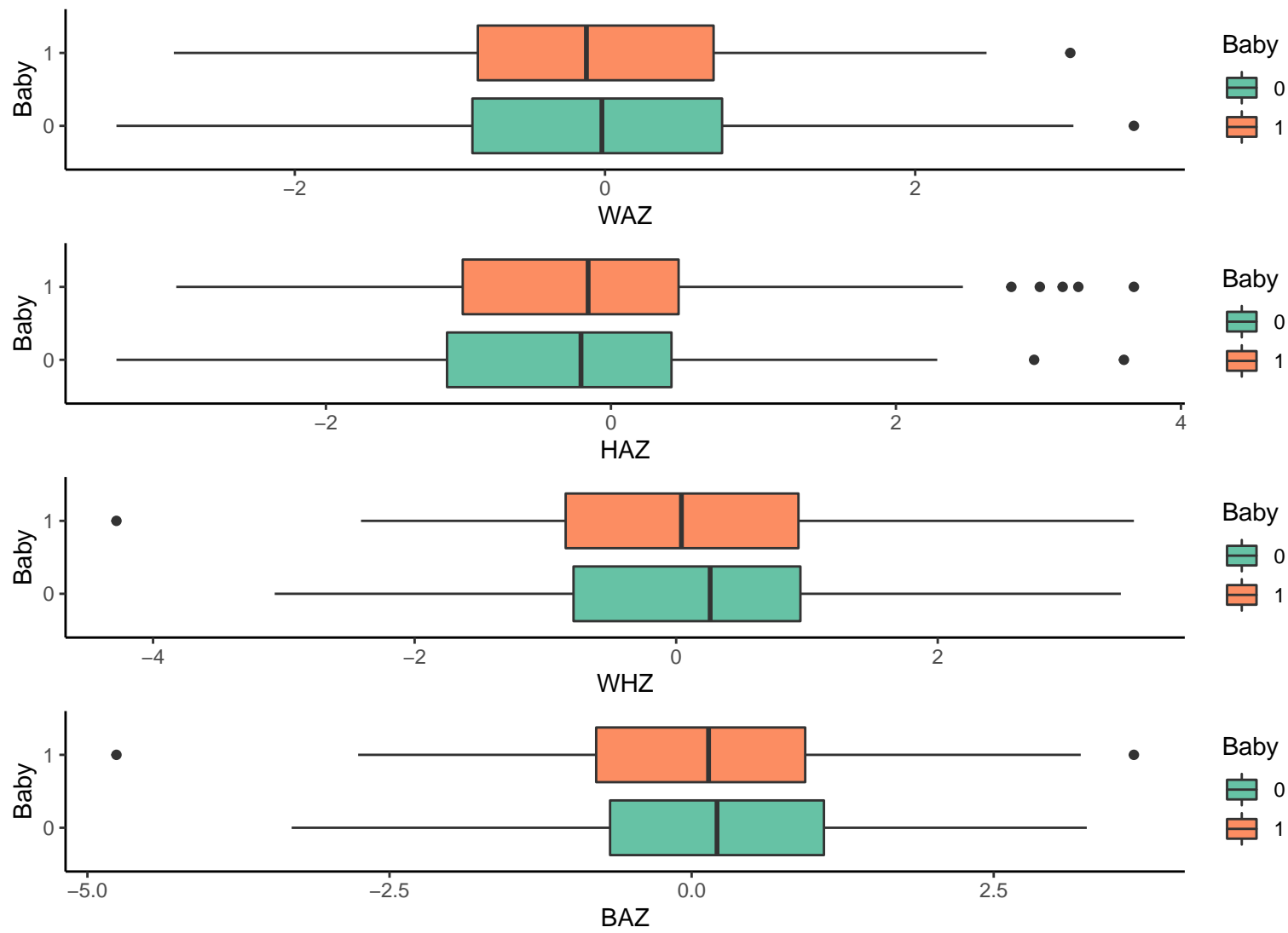
The p-value for MUACZ was: 0.6768 which indicate no significant difference.

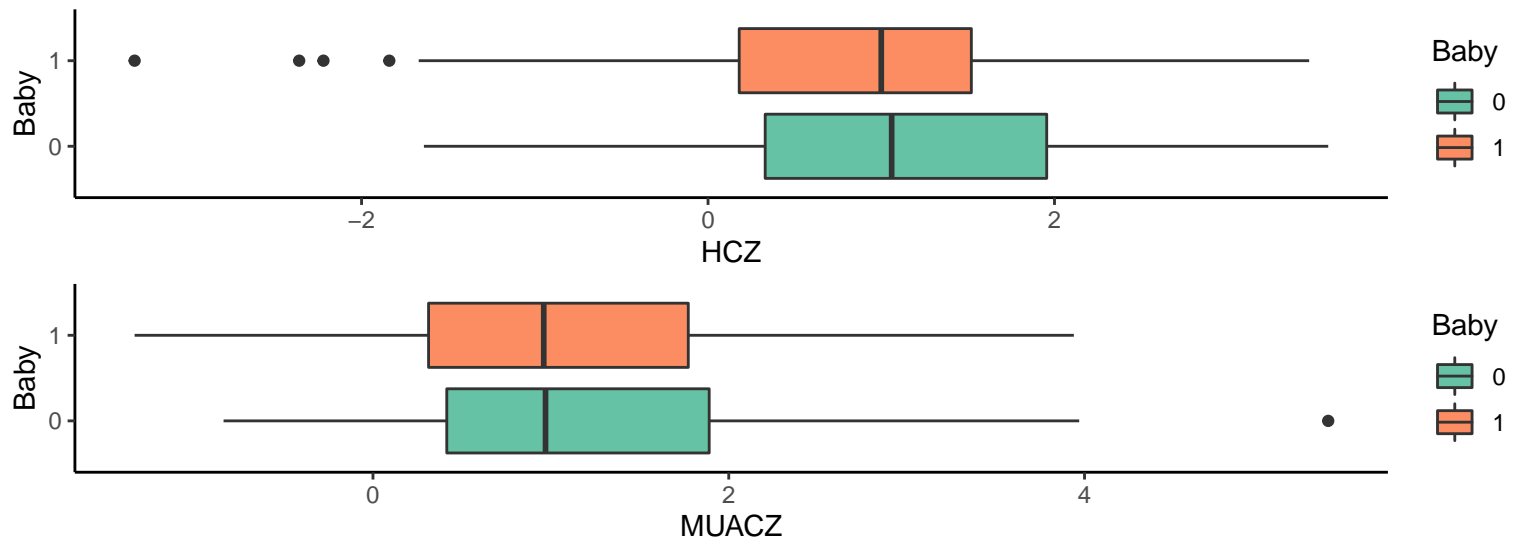
2.3.4 Baby had any liquids other than breast milk or formula since his/her birth (early introduction of food)

In all instances we used the Shapiro Wilk test to determine if the data was normally distributed. If the data was normal, the independent t-test was used to compare the groups while the Mann Whitney U tests was used in the non-normal cases. All tests were performed at a 5% level of significance.

	DataA (N = 234)	0 (N = 83)	1 (N = 151)
WAZ			
Missing Values	0	0	0
min	-3.15	-3.15	-2.78
max	3.41	3.41	3
mean (sd)	-0.03 ± 1.18	-0.01 ± 1.28	-0.04 ± 1.12
median (iqr)	-0.08 (-0.83, 0.72)	-0.02 (-0.85, 0.76)	-0.12 (-0.82, 0.70)
mean (CI)	-0.03 (95% CI: -0.18, 0.12)	-0.01 (95% CI: -0.29, 0.26)	-0.04 (95% CI: -0.22, 0.13)
HAZ			
Missing Values	0	0	0
min	-3.47	-3.47	-3.05
max	3.67	3.6	3.67
mean (sd)	-0.23 ± 1.30	-0.29 ± 1.33	-0.19 ± 1.28
median (iqr)	-0.20 (-1.09, 0.44)	-0.21 (-1.15, 0.42)	-0.16 (-1.04, 0.47)
mean (CI)	-0.23 (95% CI: -0.40, -0.06)	-0.29 (95% CI: -0.58, -0.01)	-0.19 (95% CI: -0.40, 0.01)
WHZ			
Missing Values	0	0	0
min	-4.28	-3.07	-4.28
max	3.5	3.4	3.5
mean (sd)	0.09 ± 1.22	0.16 ± 1.24	0.05 ± 1.21
median (iqr)	0.10 (-0.82, 0.94)	0.26 (-0.79, 0.95)	0.04 (-0.84, 0.94)
mean (CI)	0.09 (95% CI: -0.06, 0.25)	0.16 (95% CI: -0.10, 0.43)	0.05 (95% CI: -0.14, 0.25)
BAZ			
Missing Values	0	0	0
min	-4.76	-3.31	-4.76
max	3.66	3.27	3.66
mean (sd)	0.15 ± 1.24	0.24 ± 1.23	0.11 ± 1.25
median (iqr)	0.18 (-0.77, 0.96)	0.21 (-0.68, 1.10)	0.14 (-0.79, 0.94)
mean (CI)	0.15 (95% CI: -0.01, 0.31)	0.24 (95% CI: -0.03, 0.50)	0.11 (95% CI: -0.09, 0.31)
HCZ			
Missing Values	6	4	2
min	-3.31	-1.64	-3.31
max	3.58	3.58	3.47
mean (sd)	228; 0.86 ± 1.18	79; 0.93 ± 1.23	149; 0.82 ± 1.15
median (iqr)	228; 1.02 (0.23, 1.64)	79; 1.06 (0.33, 1.96)	149; 1.00 (0.18, 1.52)
mean (CI)	0.86 (95% CI: 0.71, 1.01)	0.93 (95% CI: 0.66, 1.21)	0.82 (95% CI: 0.64, 1.01)
MUACZ			
Missing Values	1	0	1

	DataA (N = 234)	0 (N = 83)	1 (N = 151)
min	-1.34	-0.84	-1.34
max	5.37	5.37	3.94
mean (sd)	233; 1.07 ± 1.13	1.22 ± 1.26	150; 0.99 ± 1.04
median (iqr)	233; 0.96 (0.39, 1.86)	0.97 (0.41, 1.89)	150; 0.96 (0.31, 1.77)
mean (CI)	1.07 (95% CI: 0.93, 1.22)	1.22 (95% CI: 0.95, 1.50)	0.99 (95% CI: 0.82, 1.15)





The p-value for WAZ was: 0.8534 which indicate no significant difference.

The p-value for HAZ was: 0.6768 which indicate no significant difference.

The p-value for WHZ was: 0.5109 which indicate no significant difference.

The p-value for BAZ was: 0.4516 which indicate no significant difference.

The p-value for HCZ was: 0.5066 which indicate no significant difference.

The p-value for MUACZ was: 0.2704 which indicate no significant difference.

2.4 Grouped child growth investigation

The following table display the categorical results for each of the child growth paramters and indicate how often poor growth occured in each group.

	CHEU Abnormal UmA-RI (N = 5)	CHEU Normal UmA-RI (N = 49)	HUU Abnormal UmA-RI (N = 13)	HUU Normal UmA-RI (N = 171)
HAZ Grouped				
Missing Values	0	0	0	0
< -2	2 (40.0%)	8 (16.3%)	2 (15.4%)	9 (5.3%)
Greater/equal to -2	3 (60.0%)	41 (83.7%)	11 (84.6%)	162 (94.7%)
WHZ Grouped				
Missing Values	0	0	0	0
< -2	0 (0.0%)	3 (6.1%)	0 (0.0%)	6 (3.5%)
Greater/equal to -2	5 (100.0%)	46 (93.9%)	13 (100.0%)	165 (96.5%)
WAZ Grouped				
Missing Values	0	0	0	0
< -2	0 (0.0%)	3 (6.1%)	1 (7.7%)	4 (2.3%)
Greater/equal to -2	5 (100.0%)	46 (93.9%)	12 (92.3%)	167 (97.7%)
WAZ Grouped 2				
Missing Values	0	0	0	0
> 2	0 (0.0%)	3 (6.1%)	0 (0.0%)	9 (5.3%)
Less/equal to 2	5 (100.0%)	46 (93.9%)	13 (100.0%)	162 (94.7%)