

## Supplementary materials

**Supplementary table 1: Description of the included studies detail**

Authors	Year	Country	Study design	Sample size	Ref. method	Evaluated anthropometry	Measurement method for anthropometry
Achebe c. et al <sup>1</sup>	2014	Nigeria	CS	428	BW	Length, OFC, MUAC, MTC	Horizontal stadiometer for length and non-stretchable plastic coated circumference tapes
Modibbo, Musa & Taura, Magaji <sup>2</sup>	2013	Nigeria	CS	551	BW	HL, HB, FL, FB	FL & HL by Plastic measuring tape, and FB & HB by sliding Vernier caliper
Tiruneh, Chalachew <sup>3</sup>	2023	Ethiopia	CS	424	GA	HC, CHL, MUAC, FL, HL, IMD, UND, BW	Non-elastic measuring tape
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	CS	129	BW	Length, MUAC, CC and HC	Non-elastic, flexible, fiber glass measuring tape
Stevenson, Alexander, et al. <sup>5</sup>	2021	South Africa	CS	106	GA	FL, HC, MUAC and abdominal circumference	FL by Calipers and Ruler; circumferences by measuring tapes
Wyk LV & Smith J. <sup>6</sup>	2016	South Africa	CS	200	GA	Length, FL, HC, BW	FL by plastic sliding Verniere caliper and circumferential measures using non-stretchable measuring tape
Ugowe OJ. et al <sup>7</sup>	2022	Nigeria	CS	420	BW	OFC, MUAC, CC, CaC, FL	FL by hard-transparent plastic ruler and circumferential measures using flexible non-elastic tape
Gidi NW. et al <sup>8</sup>	2019	Ethiopia	CS	1389	BW & GA	FL, CC, MUAC	FL by stiff transparent plastic metric ruler and circumferential measures using flexible non-elastic tape
Marchant et al. <sup>9</sup>	2010	Tanzania	CS	529	BW & GA	FL	FL by stiff transparent plastic metric ruler
Chukwudi NK et al. <sup>10</sup>	2018	Nigeria	CS	299	BW	HC, CC, MUAC, abdominal girth	Flexible measuring tape

Otupiri E. et al. <sup>11</sup>	2014	Ghana	CS	973	BW	MUAC, BL, FL, OFC, CC, ThC, CaC	Non-elastic, flexible measuring tape
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	CS	341	BW & GA	CC, MUAC, HC, FL	Flexible measuring tape
Olusanya BO. <sup>13</sup>	2010	Nigeria	CS	3869	BW	HC, CHL	Polyurethane plastic mats
Tiruneh C & Teshome D. <sup>14</sup>	2021	Ethiopia	CS	424	BW	CHL, FL, HL, MUAC, UND, IMD, HC	Flexible non-elastic measuring tape
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	CS	422	BW	FL, HC, CC	HC & CC by using non extendable measuring tape and FL by hard transparent plastic ruler
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	CS	706	BW	HC, FL, MUAC, ThC, CC	FL by hard transparent plastic ruler & circumferential by flexible non-elastic tape
Ndu IK. et al. <sup>17</sup>	2014	Nigeria	CS	511	BW	CC, OFC	Non-elastic, flexible, fiber glass measuring tape
Paulsen, C.B. et al. <sup>18</sup>	2019	Tanzania	Cohort	376	BW & GA	MUAC, FL, CC	FL by transparent plastic ruler and circumferential measures using flexible non-stretchable tape measure
E. Nabweimba et al. <sup>19</sup>	2013	Uganda	CS	711	BW & GA	FL	FL was measured using (1) a hard transparent plastic ruler, (2) foot print on a plain paper & measuring the picture, & (3) tailor's tape
Ayesiga S et al. <sup>20</sup>	2019	Uganda	CS	553	BW	MUAC, BL, FL, HC, CC, ThC, CaC	Non extendable measuring tapes
Dagne N. et al. <sup>21</sup>	2020	Ethiopia	CS	204	BW & GA	FL	Vernier sliding caliper
<p>CS- Cross sectional; BW- Birth Weight; GA-Gestational Age  FL-Foot length; HC- Head Circumference; OFC- Occipito-frontal Circumference; MUAC- Mid-Upper Arm Circumference; CC- Chest Circumference; CaC- Calf Circumference; UND- Umbilical Nipple Distance; CHL- Crown-Heel Length</p>							

**Supplementary table 2: Abstracted data for correlation coefficient values reported by the included studies**

Authors	Year	Country	Sample size	Corr. Coeff.	rLL of 95%CI	rUL of 95%CI	Ref. method	Test method (index tests)
Dagnev N. et al. <sup>21</sup>	2020	Ethiopia	204	0.803	0.75	0.85	BW	FL Vs BW
Achebe C. et al. <sup>1</sup>	2014	Nigeria	428	0.87	0.85	0.89	BW	MUAC Vs BW
Achebe C. et al. <sup>1</sup>	2014	Nigeria	428	0.82	0.78	0.85	BW	HC Vs BW
Ayesiga S. et al. <sup>20</sup>	2019	Uganda	553	0.634	0.58	0.68	BW	FL Vs BW
Ayesiga S. et al. <sup>20</sup>	2019	Uganda	553	0.629	0.57	0.68	BW	CC Vs BW
Ayesiga S. et al. <sup>20</sup>	2019	Uganda	553	0.603	0.55	0.65	BW	HC Vs BW
Ayesiga S. et al. <sup>20</sup>	2019	Uganda	553	0.584	0.53	0.64	BW	MUAC Vs BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	0.64	0.57	0.7	BW	HC Vs BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	0.76	0.73	0.79	BW	FL Vs BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	0.67	0.63	0.71	BW	MUAC Vs BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	0.72	0.68	0.75	BW	CC Vs BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	0.63	0.58	0.67	BW	HC Vs BW
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	422	0.74	0.7	0.79	BW	FL Vs BW
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	422	0.85	0.82	0.87	BW	CC Vs BW
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	422	0.825	0.792	0.853	BW	HC Vs BW
Modibbo M. et al. <sup>2</sup>	2013	Nigeria	551	0.65	0.61	0.7	BW	FL Vs BW
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	129	0.673	0.57	0.76	BW	MUAC Vs BW
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	129	0.637	0.52	0.73	BW	CC Vs BW
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	129	0.59	0.5	0.7	BW	HC Vs BW
Ndu IK. et al. <sup>17</sup>	2014	Nigeria	511	0.92	0.91	0.93	BW	CC Vs BW
Ndu IK. et al. <sup>17</sup>	2014	Nigeria	511	0.821	0.79	0.85	BW	HC Vs BW
Olusanya BO. <sup>13</sup>	2010	Nigeria	3869	0.648	0.63	0.67	BW	HC Vs BW
Otupiri E. et al. <sup>11</sup>	2014	Ghana	973	0.53	0.48	0.57	BW	FL Vs BW
Otupiri E. et al. <sup>11</sup>	2014	Ghana	973	0.68	0.64	0.71	BW	MUAC Vs BW
Otupiri E. et al. <sup>11</sup>	2014	Ethiopia	973	0.69	0.66	0.72	BW	CC Vs BW
Otupiri E. et al. <sup>11</sup>	2014	Ghana	973	0.58	0.54	0.62	BW	HC Vs BW
Paulsen C.B. et al. <sup>18</sup>	2019	Tanzania	376	0.66	0.6	0.71	BW	FL Vs BW

Paulsen C.B. et al. <sup>18</sup>	2019	Tanzania	376	0.78	0.74	0.82	BW	MUAC Vs BW
Paulsen C.B. et al. <sup>18</sup>	2019	Tanzania	376	0.86	0.83	0.88	BW	CC Vs BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.53	0.44	0.61	BW	FL Vs BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.65	0.58	0.71	BW	MUAC Vs BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.72	0.66	0.79	BW	CC Vs BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.63	0.55	0.71	BW	HC Vs BW
Tiruneh C. et al. <sup>14</sup>	2021	Ethiopia	424	0.46	0.38	0.53	BW	FL Vs BW
Tiruneh C. et al. <sup>14</sup>	2021	Ethiopia	424	0.47	0.4	0.54	BW	MUAC Vs BW
Tiruneh C. et al. <sup>14</sup>	2021	Ethiopia	424	0.371	0.29	0.45	BW	HC Vs BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	0.75	0.71	0.79	BW	FL Vs BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	0.83	0.8	0.86	BW	MUAC Vs BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	0.84	0.81	0.86	BW	CC Vs BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	0.746	0.7	0.79	BW	HC Vs BW
Dagne N. et al. <sup>21</sup>	2020	Ethiopia	204	0.865	0.832	0.895	GA	FL Vs GA
Paulsen C.B. et al. <sup>18</sup>	2019	Tanzania	376	0.37	0.28	0.45	GA	FL Vs GA
Paulsen C.B. et al. <sup>18</sup>	2019	Tanzania	376	0.31	0.22	0.4	GA	MUAC Vs GA
Paulsen C.B. et al. <sup>18</sup>	2019	Tanzania	376	0.41	0.3	0.5	GA	CC Vs GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.48	0.39	0.57	GA	FL Vs GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.59	0.51	0.67	GA	MUAC Vs GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	0.62	0.55	0.68	GA	CC Vs GA
Tiruneh C. <sup>3</sup>	2023	Ethiopia	424	0.143	0.05	0.235	GA	FL Vs GA
Tiruneh C. <sup>3</sup>	2023	Ethiopia	424	0.149	0.054	0.241	GA	HC Vs GA
Wyk L. et al. <sup>6</sup>	2016	South Africa	200	0.919	0.89	0.94	GA	FL Vs GA
Wyk L. et al. <sup>6</sup>	2016	South Africa	200	0.903	0.87	0.93	GA	HC Vs GA

BW- Birth Weight; GA-Gestational Age; rLL- correlation coefficient Lower Limit of 95% CI; rUL- correlation coefficient Upper Limit of 95% CI  
 FL-Foot length; HC- Head Circumference; MUAC- Mid-Upper Arm Circumference; CC- Chest Circumference; Vs- Versus

**Supplementary table 3: Abstracted data for diagnostic accuracy values reported by the included studies**

Authors	Year	Country	Sample size	Cut-off	Total N	Cases	Controls	Tp	Fp	Tn	Fn	Ref. method	Test method (Index tests)
Achebe C. et al. <sup>1</sup>	2014	Nigeria	428	10.5	428	65	363	64	45	318	1	BW	MUAC and BW
Achebe C. et al. <sup>1</sup>	2014	Nigeria	428	34.15	428	65	363	63	163	200	2	BW	HC and BW
Ayesiga S et al. <sup>20</sup>	2019	Uganda	553	8	553	29	524	26	253	271	3	BW	FL and BW
Ayesiga S et al. <sup>20</sup>	2019	Uganda	553	10.2	553	29	524	24	126	398	5	BW	MUAC and BW
Ayesiga S et al. <sup>20</sup>	2019	Uganda	553	30.9	553	29	524	27	145	379	2	BW	CC and BW
Ayesiga S et al. <sup>20</sup>	2019	Uganda	553	34.1	553	29	524	24	126	398	5	BW	HC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	30	299	64	235	63	13	222	1	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	28.8	299	64	235	52	1	234	12	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	28.9	299	64	235	54	1	234	10	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29	299	64	235	55	2	233	9	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.1	299	64	235	55	3	232	9	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.2	299	64	235	55	5	230	9	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.3	299	64	235	56	7	228	8	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.4	299	64	235	58	7	228	6	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.5	299	64	235	58	9	226	6	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.6	299	64	235	59	9	226	5	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	29.9	299	64	235	61	11	224	3	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	30.2	299	64	235	63	14	221	1	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	30.3	299	64	235	63	16	219	1	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	30.4	299	64	235	63	17	218	1	BW	CC and BW
Chukwudi NK. et al. <sup>10</sup>	2018	Nigeria	299	30.5	299	64	235	63	20	215	1	BW	CC and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.6	711	85	626	72	116	510	13	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.2	711	85	626	33	13	613	52	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.3	711	85	626	42	23	603	43	BW	FL and BW

E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.4	711	85	626	46	29	597	39	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.5	711	85	626	50	39	587	35	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.7	711	85	626	74	134	492	11	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.8	711	85	626	74	134	492	11	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	7.9	711	85	626	79	173	453	6	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	8	711	85	626	80	180	446	5	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	8.1	711	85	626	83	348	278	2	BW	FL and BW
E. Nabweмба et al. <sup>19</sup>	2013	Uganda	711	8.2	711	85	626	84	448	178	1	BW	FL and BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	7.9	706	85	621	80	108	513	5	BW	FL and BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	10.1	706	85	621	79	121	500	6	BW	MUAC and BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	31	706	85	621	78	65	556	7	BW	CC and BW
Elizabeth NL. et al. <sup>16</sup>	2013	Uganda	706	33.3	706	85	621	70	109	512	15	BW	HC and BW
Gidi NW. et al. <sup>8</sup>	2019	Ethiopia	1389	7.7	1389	203	1186	171	310	876	32	BW	FL and BW
Gidi NW. et al. <sup>8</sup>	2019	Ethiopia	1389	9.8	1389	203	1186	170	116	1070	33	BW	MUAC and BW
Gidi NW. et al. <sup>8</sup>	2019	Ethiopia	1389	31.2	1389	203	1186	186	173	1013	17	BW	CC and BW
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	422	7.45	422	114	308	90	41	267	24	BW	FL and BW
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	422	30.15	422	114	308	96	45	263	18	BW	CC and BW
Hadush MY. et al. <sup>15</sup>	2017	Ethiopia	422	33.25	422	114	308	92	31	277	22	BW	HC and BW
Marchant et al. <sup>9</sup>	2010	Tanzania	529	8	529	78	451	68	180	271	10	BW	FL and BW
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	129	9	129	17	112	12	8	104	5	BW	MUAC and BW
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	129	31	129	17	112	10	8	104	7	BW	CC and BW
Mohsen M A. et al. <sup>4</sup>	2011	Egypt	129	32	129	17	112	10	12	100	7	BW	HC and BW
Ndu IK. et al. <sup>17</sup>	2014	Nigeria	511	30.9	511	72	439	66	23	416	6	BW	CC and BW
Ndu IK. et al. <sup>17</sup>	2014	Nigeria	511	33.8	511	72	439	61	44	395	11	BW	HC and BW
Olusanya BO. <sup>13</sup>	2010	Nigeria	3869	32.95	3869	418	3451	342	514	2937	76	BW	HC and BW
Otupiri E. et al. <sup>11</sup>	2014	Ghana	973	9.4	973	211	762	150	53	709	61	BW	MUAC and BW
Otupiri E. et al. <sup>11</sup>	2014	Ghana	973	29.8	973	211	762	156	53	709	55	BW	CC and BW
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	7.6	376	39	337	31	84	253	8	BW	FL and BW
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	7.7	376	39	337	37	160	216	2	BW	FL and BW
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	10.1	376	39	337	33	91	246	6	BW	MUAC and BW
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	9.9	376	39	337	30	57	280	9	BW	MUAC and BW



Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	31.2	376	39	337	33	57	280	6	BW	CC and BW
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	31.6	376	39	337	34	81	256	5	BW	CC and BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	6.9	341	80	261	76	51	210	4	BW	FL and BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	7.7	341	80	261	73	31	230	7	BW	MUAC and BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	29.4	341	80	261	72	37	224	8	BW	CC and BW
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	33.1	341	80	261	60	14	247	20	BW	HC and BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	7.4	420	131	289	121	71	218	10	BW	FL and BW
Ugowe OJ. et al.	2022	Nigeria	420	9.8	420	131	289	120	24	265	11	BW	MUAC and BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	30.2	420	131	289	117	21	267	14	BW	CC and BW
Ugowe OJ. et al. <sup>7</sup>	2022	Nigeria	420	32.9	420	131	289	122	51	238	9	BW	HC and BW
Dagnew N. et al. <sup>21</sup>	2020	Ethiopia	204	7.35	204	68	136	67	5	131	1	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.5	711	29	682	25	65	617	4	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.2	711	29	682	19	29	653	10	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.3	711	29	682	22	44	638	7	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.4	711	29	682	23	53	629	6	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.6	711	29	682	28	162	520	1	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.7	711	29	682	28	182	500	1	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.8	711	29	682	28	182	500	1	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	7.9	711	29	682	28	221	461	1	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	8	711	29	682	28	231	451	1	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	8.1	711	29	682	29	400	282	0	GA	FL and GA
E. Nabiwemba et al. <sup>19</sup>	2013	Uganda	711	8.2	711	29	682	29	500	181	0	GA	FL and GA
Gidi NW. et al. <sup>8</sup>	2019	Ethiopia	1389	7.5	1389	143	1246	117	287	959	26	GA	FL and GA
Gidi NW. et al. <sup>8</sup>	2019	Ethiopia	1389	10	1389	143	1246	119	456	790	24	GA	MUAC and GA
Gidi NW. et al. <sup>8</sup>	2019	Ethiopia	1389	31.4	1389	143	1246	120	247	999	23	GA	CC and GA
Marchant et al. <sup>9</sup>	2010	Tanzania	529	8	529	44	485	41	204	281	3	GA	FL and GA
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	7.45	376	17	359	15	54	305	2	GA	FL and GA
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	7.7	376	17	359	16	129	230	1	GA	FL and GA
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	9.9	376	17	359	13	61	298	4	GA	MUAC and GA
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	10.1	376	17	359	14	97	262	3	GA	MUAC and GA
Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	30.3	376	17	359	16	29	330	1	GA	CC and GA

Paulsen CB. et al. <sup>18</sup>	2019	Tanzania	376	31.6	376	17	359	16	101	258	1	GA	CC and GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	7.1	341	85	256	66	24	232	19	GA	FL and GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	7.9	341	85	256	76	33	223	9	GA	MUAC and GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	30.1	341	85	256	63	12	244	22	GA	C and GA
Sintayehu E. et al. <sup>12</sup>	2023	Ethiopia	341	33.7	341	85	256	60	21	235	25	GA	HC and GA
Stevenson A. et al. <sup>5</sup>	2021	South Africa	106	7.5	106	83	23	82	9	14	1	GA	FL and GA
Stevenson A. et al. <sup>5</sup>	2021	South Africa	106	33	106	83	23	79	7	16	4	GA	HC and GA
Stevenson A. et al. <sup>5</sup>	2021	South Africa	106	32	106	83	23	69	3	20	14	GA	HC and GA
Stevenson A. et al. <sup>5</sup>	2021	South Africa	106	7	106	83	23	73	10	22	1	GA	FL and GA

BW- Birth Weight; GA-Gestational Age; N- Number; Tp- True Positive; Tn- True Negative; Fp- False Positive; Fn- False Negative  
 FL-Foot length; HC- Head Circumference; MUAC- Mid-Upper Arm Circumference; CC- Chest Circumference



**Supplementary table 4: Qualitative summary anthropometric measurements' feasibility to identify LBW and preterm infants, 2023**

<b>Anthropometry</b>	<b>Strength/ advantages</b>	<b>Weakness/ limitations</b>
<b>Foot length:</b> Measured from heel to tip of big/longest toe using ruler, calipers, non-elastic tape and foot print	<ul style="list-style-type: none"> <li>• Doesn't require special training</li> <li>• Can be done by simple and easily available equipment</li> <li>• Minimal exposure and undressing of infant</li> <li>• Easily inserted through incubator/ cause less distress</li> <li>• Low inter-observer variability</li> <li>• Not influenced by moulding or edema</li> <li>• Done by multiple methods &amp; applied outside health facility</li> <li>• Has better prediction up to day 5 after birth</li> </ul>	<ul style="list-style-type: none"> <li>• Lower accuracy than some measures like CC</li> <li>• Requires proper positioning to avoid grasp reflex</li> </ul>
<b>Head Circumference:</b> Measured with using non-elastic tape above supraorbital ridges anteriorly and occipital prominence posteriorly	<ul style="list-style-type: none"> <li>• Simple tape measure is easy to use</li> </ul>	<ul style="list-style-type: none"> <li>• Has high liability of head moulding during birth especially prolonged and obstructed labor</li> <li>• More difficult to standardize landmarks</li> <li>• High intra-observer variability</li> <li>• Affected by intrauterine growth restriction &amp; genetic abnormality</li> </ul>
<b>MUAC:</b> Measured at midpoint between acromion and olecranon process on bare arm, perpendicular to arm without compressing tissue using non-elastic tape	<ul style="list-style-type: none"> <li>• Simple to measure, replicable</li> <li>• Minimal infant exposure</li> <li>• Used in other growth monitoring</li> <li>• Has better prediction up to day 5 after birth</li> </ul>	<ul style="list-style-type: none"> <li>• Slightly higher inter-observer variability</li> <li>• Palpating landmarks can be difficult</li> <li>• High intra-observer variability</li> </ul>
<b>Chest Circumference:</b> Measured at nipple line with tape at end expiration phase of breathing using non-elastic tape	<ul style="list-style-type: none"> <li>• High accuracy</li> <li>• Easy to measure, clear nipple line landmark</li> <li>• Minimal soft tissue changes from delivery</li> <li>• Has a larger cross-section with less chance of systematic or random errors in measurement</li> <li>• Low inter-observer variability</li> </ul>	<ul style="list-style-type: none"> <li>• Requires exposure and timing of respiration</li> <li>• Hypothermia risk from undressing</li> </ul>
<b>Thigh Circumference:</b> Measured at gluteal furrow using non-elastic tape wrapped around thigh	<ul style="list-style-type: none"> <li>• Simple measurement with tape</li> </ul>	<ul style="list-style-type: none"> <li>• Landmarks are subjective</li> <li>• High intra-observer variability</li> </ul>
<b>Calf Circumference:</b> Measured at maximum bulk of calf using non-elastic tape	<ul style="list-style-type: none"> <li>• Simple measurement with tape</li> <li>• Moderate accuracy</li> </ul>	<ul style="list-style-type: none"> <li>• Subjective landmarks like</li> <li>• Positioning requires flexion of knee</li> </ul>

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<p><b>Combination of anthropometries:</b> Measured separately for each anthropometry</p>	<ul style="list-style-type: none"> <li>• Has better accuracy</li> </ul>	<ul style="list-style-type: none"> <li>• High intra-observer variability</li> <li>• Require additional calculation</li> <li>• Expose infants and require more time</li> </ul>
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**Supplementary table 5: Univariate meta-regression of potential moderators**

Anthropometric measurements	Moderators	Coefficient	Standard error	P-value
FL(for BW)	Publication year	-0.0386	0.0273	0.102
	Sample size	-0.0008	0.0004	0.062
MUAC	Publication year	-0.0101	0.0241	0.674
	Sample size	-0.0002	0.0004	0.699
CC	Publication year	0.0210	0.0222	0.816
	Sample size	-0.0001	0.0004	0.802
HC	Publication year	-0.0153	0.0208	0.462
	Sample size	-0.0001	0.0001	0.545
FL (for GA)	Publication year	-0.0065	0.0160	0.6826
	Sample size	-0.0052	0.0004	<0.0001*

**Appendix 1: Literature search strategy**

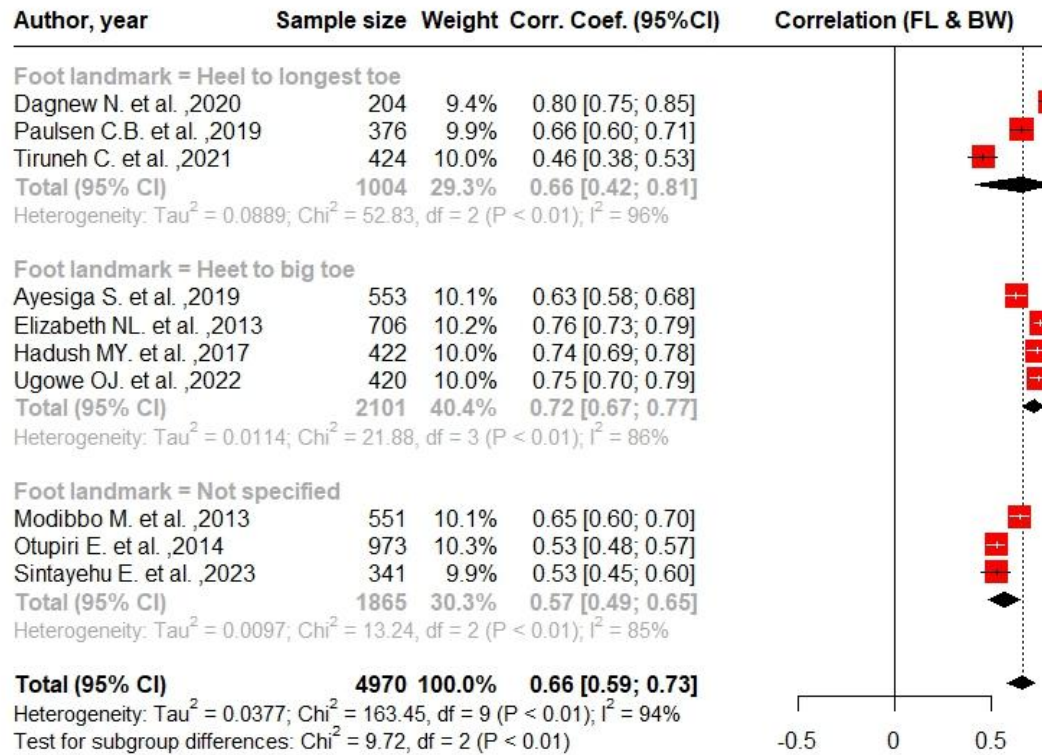
Database	Search term
PubMed	"birth weight"[MeSH Terms] OR "infant, low birth weight"[MeSH Terms] OR "anthropometry"[MeSH Terms] OR "gestational age"[MeSH Terms] OR "birth weight"[Title/Abstract] OR "birthweight"[Title/Abstract] OR "low birthweight"[Title/Abstract] OR "mid upper arm circumference*"[Title/Abstract] OR "MUAC"[Title/Abstract] OR "foot length"[Title/Abstract] OR "chest circumference*"[Title/Abstract] OR "head circumference*"[Title/Abstract] OR "anthropometr*"[Title/Abstract] OR "gestational age*"[Title/Abstract] OR "surrogate*"[Title/Abstract] AND "diagnosis"[MeSH Terms] OR "sensitivity and specificity"[MeSH Terms] OR "weights and measures"[MeSH Terms] OR "diagnostic accuracy"[Title/Abstract] OR "sensitivity"[Title/Abstract] OR "specificity"[Title/Abstract] OR "sensitivity and specificity"[Title/Abstract] OR "predictive value*"[Title/Abstract] OR "feasib*"[Title/Abstract] OR "acceptab*"[Title/Abstract] OR "reliab*"[Title/Abstract] OR "estimate*"[Title/Abstract] OR "measur*"[Title/Abstract] AND "infant, newborn"[MeSH Terms] OR "premature birth"[MeSH Terms] OR "infant*"[Title/Abstract] AND "newborn*"[Title/Abstract] OR "newborn infant*"[Title/Abstract] OR "neonat*"[Title/Abstract] OR "prematu*"[Title/Abstract] OR "premature birth*"[Title/Abstract] OR "preterm*"[Title/Abstract] AND "africa"[MeSH Terms] OR "africa*"[Title/Abstract]
Google scholar	(birthweight OR "Mid-upper arm circumference" OR "Foot length" OR "Head circumference" OR "Calf circumference" OR Anthropometry OR "Gestational age") AND ("Surrogate Accuracy" OR Sensitivity OR Specificity OR "Predictive values" OR Feasibility OR Acceptability OR Reliability OR Estimation OR Measurement) AND (Infant OR neonate OR newborn OR Premature OR Preterm)
EMBASE	('birth weight'/exp OR 'infant, low birth weight'/exp OR 'anthropometry'/exp OR 'gestational age'/exp OR 'birth weight':ab,ti OR 'birthweight':ab,ti OR 'low birthweight':ab,ti OR 'mid upper arm circumference':ab,ti OR 'MUAC':ab,ti OR 'foot length':ab,ti OR 'chest circumference':ab,ti OR 'head circumference':ab,ti OR 'anthropometr':ab,ti OR 'gestational age':ab,ti OR 'surrogate':ab,ti) AND ('diagnosis'/exp OR 'sensitivity and specificity'/exp OR 'weights and measures'/exp OR 'diagnostic accuracy':ab,ti OR 'sensitivity':ab,ti OR 'specificity':ab,ti OR 'sensitivity and specificity':ab,ti OR 'predictive value':ab,ti OR 'feasib':ab,ti OR 'acceptab':ab,ti OR 'reliab':ab,ti OR 'estimate':ab,ti OR 'measur':ab,ti) AND (((('infant, newborn'/exp OR 'premature birth'/exp OR 'infant':ab,ti) AND 'newborn':ab,ti) OR 'newborn infant':ab,ti OR 'neonat':ab,ti OR 'prematu':ab,ti OR 'premature birth':ab,ti OR 'preterm':ab,ti) AND ('africa'/exp OR 'africa':ab,ti) NOT 'case report'/de

**Appendix 2: Quality assessment results; quality assessment of diagnostic accuracy studies (QUADAS-2) rating**

Study (Author, year)	Reference & Index tests evaluated	Risk of bias				Applicability concern			Overall
		D1	D2	D3	D4	D1	D2	D3	
Achebe C. et al. 2014 <sup>1</sup>	BW, HC	Low	Low	Low	Unclear	Low	Low	Low	Low
Achebe C. et al. 2014 <sup>1</sup>	BW, MUAC	Low	Low	Low	Unclear	Low	Low	Low	Low
Ayesiga S et al. 2019 <sup>20</sup>	BW, CC	Low	Low	Low	Low	Low	Low	Low	Low
Ayesiga S et al. 2019 <sup>20</sup>	BW, FL	Low	Low	Low	Low	Low	Low	Low	Low
Ayesiga S et al. 2019 <sup>20</sup>	BW, HC	Low	Low	Low	Low	Low	Low	Low	Low
Ayesiga S et al. 2019 <sup>20</sup>	BW, MUAC	Low	Low	Low	Low	Low	Low	Low	Low
Chukwudi NK. et al. 2018 <sup>10</sup>	BW, CC	Low	Unclear	Low	Low	Low	Low	Low	Low
Dagnev N. et al. 2020 <sup>21</sup>	GA, FL	Low	Low	Low	Low	Low	Low	Low	Low
E. Nabweya et al. 2013 <sup>19</sup>	BW, FL	Low	Low	Low	Unclear	Low	Low	Low	Low
E. Nabweya et al. 2013 <sup>19</sup>	GA, FL	Low	Low	Low	Unclear	Low	Low	Low	Low
Elizabeth NL. et al. 2013 <sup>16</sup>	BW, CC	Low	Low	Low	Unclear	Low	Low	Low	Low
Elizabeth NL. et al. 2013 <sup>16</sup>	BW, FL	Low	Low	Low	Unclear	Low	Low	Low	Low
Elizabeth NL. et al. 2013 <sup>16</sup>	BW, HC	Low	Low	Low	Unclear	Low	Low	Low	Low
Elizabeth NL. et al. 2013 <sup>16</sup>	BW, MUAC	Low	Low	Low	Unclear	Low	Low	Low	Low
Gidi NW. et al. 2019 <sup>8</sup>	BW, CC	Low	Low	Low	Low	Low	Low	Low	Low
Gidi NW. et al. 2019 <sup>8</sup>	BW, FL	Low	Low	Low	Low	Low	Low	Low	Low
Gidi NW. et al. 2019 <sup>8</sup>	BW, MUAC	Low	Low	Low	Low	Low	Low	Low	Low
Gidi NW. et al. 2019 <sup>8</sup>	GA, CC	Low	Low	Low	Low	Low	Low	Low	Low
Gidi NW. et al. 2019 <sup>8</sup>	GA, FL	Low	Low	Low	Low	Low	Low	Low	Low
Gidi NW. et al. 2019 <sup>8</sup>	GA, MUAC	Low	Low	Low	Low	Low	Low	Low	Low
Hadush MY. et al. 2017 <sup>15</sup>	BW, CC	Low	Low	Low	Low	Low	Low	Low	Low
Hadush MY. et al. 2017 <sup>15</sup>	BW, FL	Low	Low	Low	Low	Low	Low	Low	Low
Hadush MY. et al. 2017 <sup>15</sup>	BW, HC	Low	Low	Low	Low	Low	Low	Low	Low

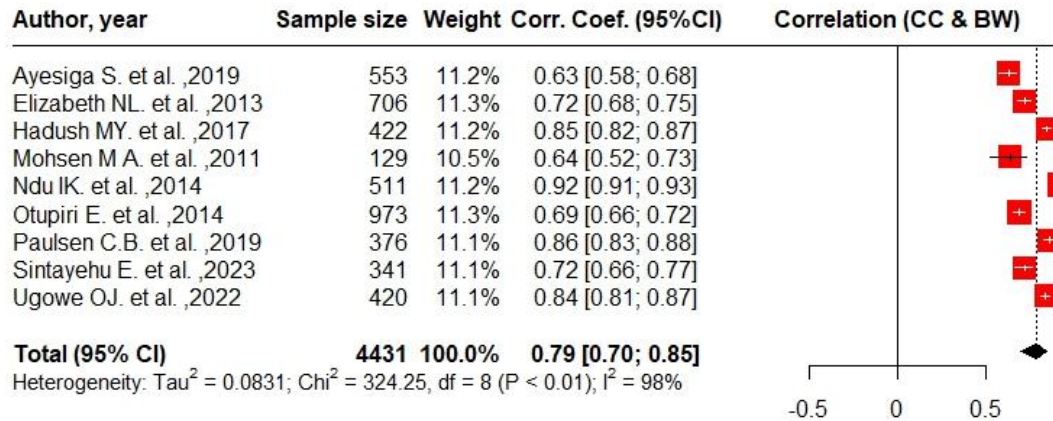
Marchant et al. 2010 <sup>9</sup>	BW, FL	Unclear	Low	Low	Low	Low	Low	Low	Low	Low
Marchant et al. 2010 <sup>9</sup>	GA, FL	Unclear	Low	Low	Low	Low	Low	Low	Low	Low
Mohsen M A. et al. 2011 <sup>4</sup>	BW, CC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Mohsen M A. et al. 2011 <sup>4</sup>	BW, HC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Mohsen M A. et al. 2011 <sup>4</sup>	BW, MUAC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Ndu IK. et al. 2014 <sup>17</sup>	BW, CC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Ndu IK. et al. 2014 <sup>17</sup>	BW, HC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Olusanya BO. 2010 <sup>13</sup>	BW, HC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Otupiri E. et al. 2014 <sup>11</sup>	BW, CC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Otupiri E. et al. 2014 <sup>11</sup>	BW, MUAC	Low	Low	Low	Unclear	Low	Low	Low	Low	Low
Paulsen CB. et al. 2019 <sup>18</sup>	BW, CC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Paulsen CB. et al. 2019 <sup>18</sup>	GA, CC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Paulsen CB. et al. 2019 <sup>18</sup>	BW, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Paulsen CB. et al. 2019 <sup>18</sup>	GA, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Paulsen CB. et al. 2019 <sup>18</sup>	BW, MUAC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Paulsen CB. et al. 2019 <sup>18</sup>	GA, MUAC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	BW, CC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	GA, CC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	BW, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	GA, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	BW, HC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	GA, HC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	BW, MUAC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Sintayehu E. et al. 2023 <sup>12</sup>	GA, MUAC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Stevenson A. et al. 2021 <sup>5</sup>	GA, HC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Stevenson A. et al. 2021 <sup>5</sup>	GA, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Ugowe OJ. et al. 2022 <sup>7</sup>	BW, CC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Ugowe OJ. et al. 2022 <sup>7</sup>	BW, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Ugowe OJ. et al. 2022 <sup>7</sup>	BW, HC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Ugowe OJ. et al. 2022 <sup>7</sup>	BW, MUAC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Modibbo M. et al. 2013 <sup>2</sup>	BW, FL	Low	Unclear	Low	Unclear	Low	Low	Low	Low	Low
Tiruneh C. 2023 <sup>3</sup>	GA, FL	Low	Low	Low	Low	Low	Low	Low	Low	Low
Tiruneh C. 2023 <sup>3</sup>	GA, MUAC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Tiruneh C. 2023 <sup>3</sup>	GA, HC	Low	Low	Low	Low	Low	Low	Low	Low	Low
Wyk L. et al. 2016 <sup>6</sup>	GA, FL	Low	Unclear	Low	Unclear	Low	Low	Low	Low	Low

Wyk L. et al. 2016 <sup>6</sup>	GA, HC	Low	Unclear	Low	Unclear	Low	Low	Low	Low
Tiruneh C. et al. 2021 <sup>14</sup>	BW, FL	Low	Unclear	Low	Unclear	Low	Low	Low	Low
<p><b>Risk of bias:</b> - DOMAIN 1(D1): PATIENT SELECTION; DOMAIN 2(D2): INDEX TEST(S); DOMAIN 3(D3): REFERENCE STANDARD; DOMAIN 4(D4): FLOW AND TIMING</p> <p><b>Applicability concern:</b> - DOMAIN 1(D1): PATIENT SELECTION; DOMAIN 2(D2): INDEX TEST(S); DOMAIN 3(D3): REFERENCE STANDARD</p> <p>BW- Birth Weight; GA-Gestational Age; FL-Foot length; HC- Head Circumference; OFC- Occipito-frontal Circumference; MUAC- Mid-Upper Arm Circumference; CC- Chest Circumference</p>									

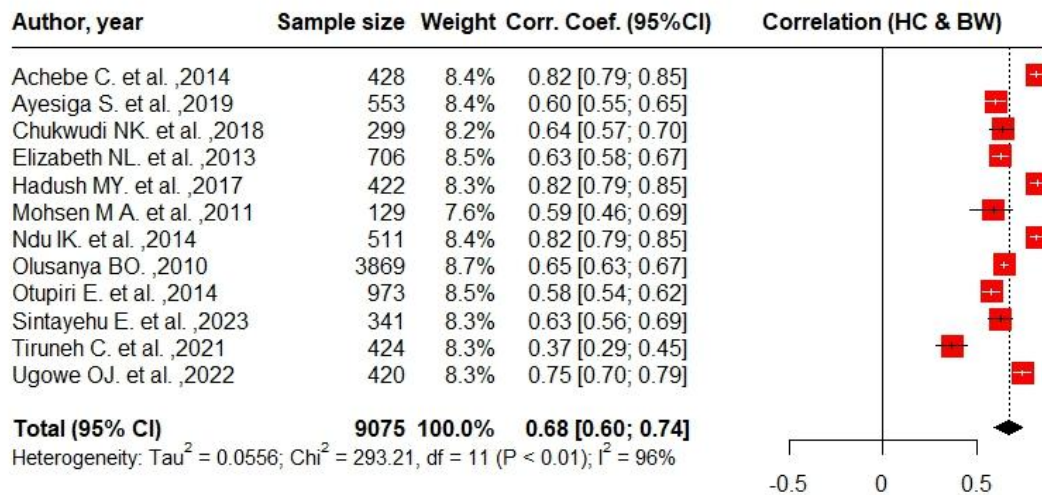
**Supplementary figure 1**

**Supplementary figure 1:** Sub-group analysis for pooled estimate of correlation coefficient between Birth Weight (BW) and Foot Length (FL) by foot landmark

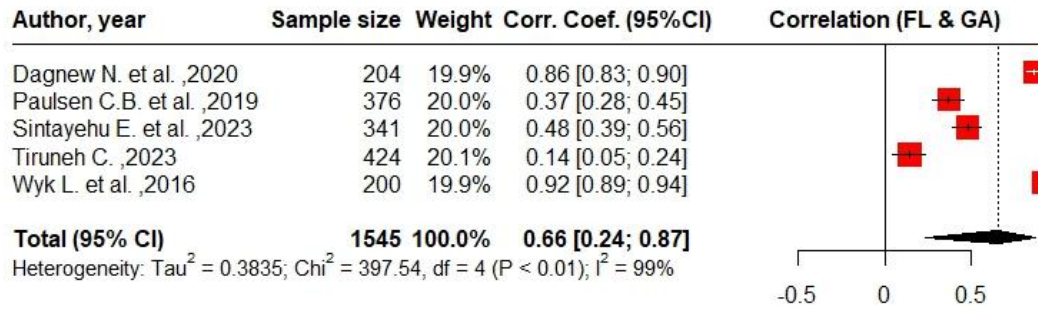


**Supplementary figure 2**

**Supplementary figure 2:** Pooled estimate of correlation coefficient between Birth Weight (BW) and Chest Circumference (CC)

**Supplementary figure 3**

**Supplementary figure 3:** Pooled estimate of correlation coefficient between Birth Weight (BW) and Head Circumference (HC)

**Supplementary figure 4**

**Supplementary figure 4:** Pooled estimate of correlation coefficient between Gestational age (GA) and Foot Length (FL)

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