

PRISMA-Infant-Outcomes (Issued: 2024 July 30)

Includes data from synapse last updated: 2024 July 30

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1. Summary

Table 1. Summary of all infant outcomes included in this report.

Denominator: All livebirths unless otherwise specified. All missing is excluded.

For more detailed output, please refer to the specified sections below.

	Total	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Total livebirths	5213	911	340	17	996	2218	731
Low birthweight <2500g (PRISMA or facility measured), n (%)	958 (18)	112 (13)	62 (19)	6 (43)	129 (13)	530 (28)	119 (17)
Low birthweight <1500g (PRISMA or facility measured), n (%)	70 (1.3)	6 (0.72)	8 (2.4)	1 (7.1)	8 (0.81)	23 (1.2)	24 (3.4)
Preterm birth <37wks, n (%)	812 (15)	59 (6.3)	39 (11)	6 (27)	97 (9.4)	507 (22)	104 (14)
SGA <3rd	521 (11)	103 (12)	28 (8.5)	3 (21)	78 (7.9)	244 (13)	65 (9.2)
SGA <10th, n (%)	1228 (26)	221 (27)	78 (24)	8 (57)	183 (19)	567 (30)	171 (24)
LGA >=90th, n (%)	125 (2.6)	25 (3)	5 (1.5)	0 (0)	35 (3.6)	34 (1.8)	26 (3.7)
Neonatal mortality, n per 1000 ^a	103 (22)	0 (0)	3 (11)	0 (0)	7 (7.9)	76 (37)	17 (25)
Stillbirth >=20wks, n per 1000 ^b	170 (32)	18 (19)	11 (31)	5 (227)	39 (38)	71 (31)	26 (34)
Total fetal deaths, n (%) ^c	255 (4.6)	23 (2.5)	18 (5.1)	10 (37)	59 (5.4)	118 (5)	27 (3.5)
Perinatal birth asphyxia, n (%)	486 (9.3)	111 (12)	29 (8.5)	2 (12)	60 (6)	223 (10)	61 (8.3)
Hyperbilirubinemia by AAP threshold, n (%) ^d	168 (3.3)	27 (3.2)	28 (8.9)	4 (21)	41 (4)	65 (3)	3 (0.43)
Any jaundice identified at any time ^e	1082 (22)	55 (6.4)	51 (17)	2 (14)	108 (11)	813 (39)	53 (7.8)
PSBI at IPC, n (%) ^f	487 (9.3)	78 (8.6)	48 (14)	2 (12)	71 (7.1)	266 (12)	22 (3)

^a Denominator is all live births with M NH09 and M NH11 filled out AND have passed the risk period with a visit OR died within the risk period (risk period: age = 28days).

^b Denominator is all livebirths and stillbirths.

^c Denominator is all infants with a fetal loss reported in M NH04 `(PRG_DSDECOD)` or birth outcome in M NH09 `(BIRTH_DSTERM_INF1)`.

^d All infants with a TcB measurement taken at <14 weeks of life.

^e All infants with a jaundice assessment at <14 weeks of life.

^f Denominator is all livebirths aged 0-59 days.

2. Low birthweight

Definition: Defined as liveborn infant weighing less than 2500g at birth.

Denominator: All infants with a MNH11 form and a reported “live birth” (BIRTH_DSTERM=1 [MNH09]).

To be included as “non-missing” for this outcome, a participant must have:

1. Live birth (varname: BIRTH_DSTERM [MNH09]).
2. Birthweight measured by PRISMA staff <72 hours following birth (varnames [form]: BW_EST_FAORRES [MNH11], BW_FAORRES [MNH11], BW_FAORRES_REPORT [MNH11]).
3. Facility reported birthweight where PRISMA <72 hours not available (varnames [form]: BW_FAORRES_REPORT [MNH11]).

Table 2. Low birthweight

Table 2						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data completeness						
Denominator	911	340	17	996	2218	731
Missing hours since birthweight measured, n (%)	291 (32)	37 (11)	5 (29)	72 (7.2)	0 (0)	102 (14)
Missing PRISMA birthweight, n (%)	302 (33)	65 (19)	7 (41)	58 (5.8)	413 (19)	167 (23)
Missing facility birthweight, n (%)	113 (12)	9 (2.6)	0 (0)	34 (3.4)	1023 (46)	461 (63)
Missing PRISMA & facility birthweight, n (%)	78 (8.6)	9 (2.6)	3 (18)	6 (0.6)	296 (13)	24 (3.3)
PRISMA measured birthweight, n (%)						
Denominator	608	275	9	937	1805	564
Normal birthweight >=2500g	522 (86)	231 (84)	6 (67)	825 (88)	1312 (73)	486 (86)
Low birthweight 1500 to <2500g	82 (13)	40 (15)	3 (33)	110 (12)	481 (27)	70 (12)
Very low birthweight <1500g	4 (0.66)	4 (1.4)	0 (0)	2 (0.21)	12 (0.66)	8 (1.4)
Any method measured birthweight, n (%)						
Denominator	833	331	14	990	1922	707
Normal birthweight >=2500g	721 (87)	269 (81)	8 (57)	861 (87)	1392 (72)	588 (83)
Low birthweight 1500 to <2500g	106 (13)	54 (16)	5 (36)	121 (12)	507 (26)	95 (13)
Very low birthweight <1500g	6 (0.72)	8 (2.4)	1 (7.1)	8 (0.81)	23 (1.2)	24 (3.4)

Figure 2a. PRISMA-measured birthweights across sites.

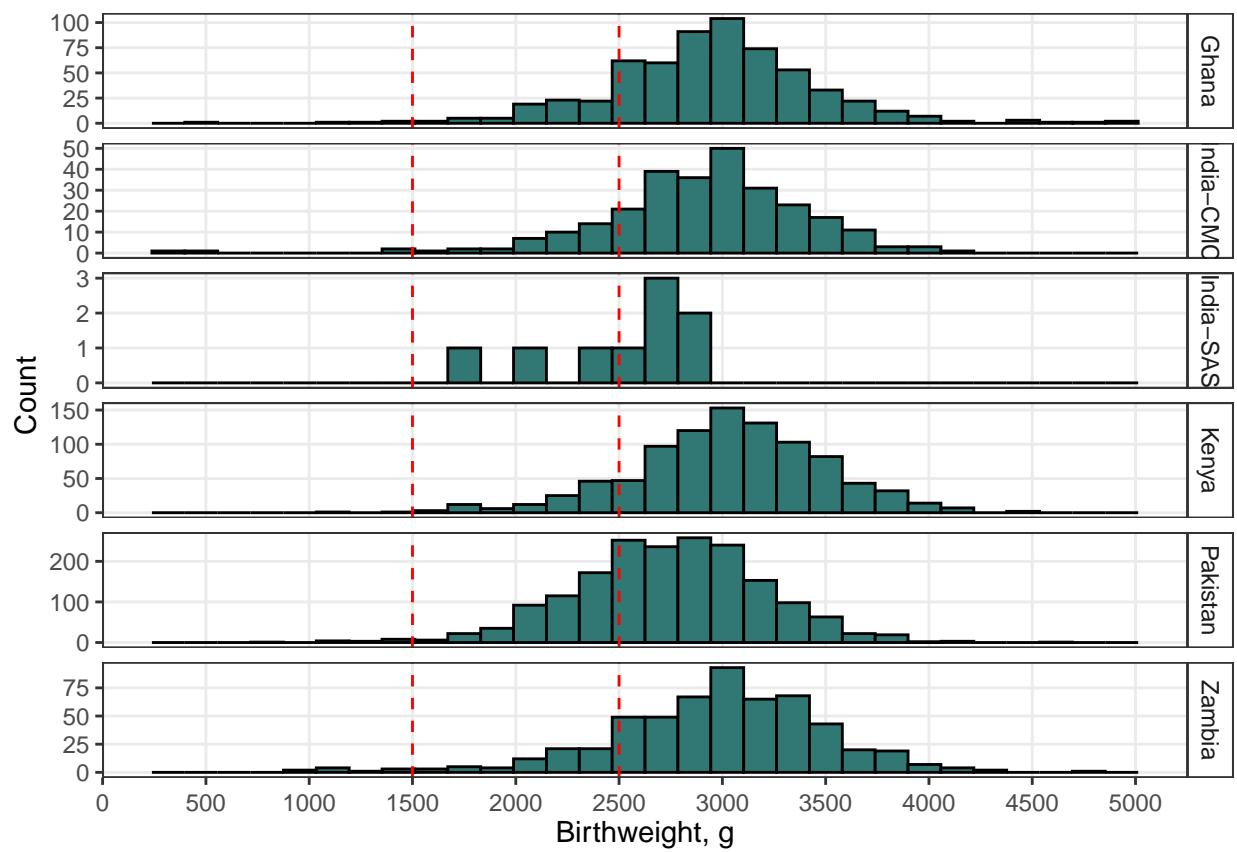


Figure 2b. Facility-reported birthweights across sites.

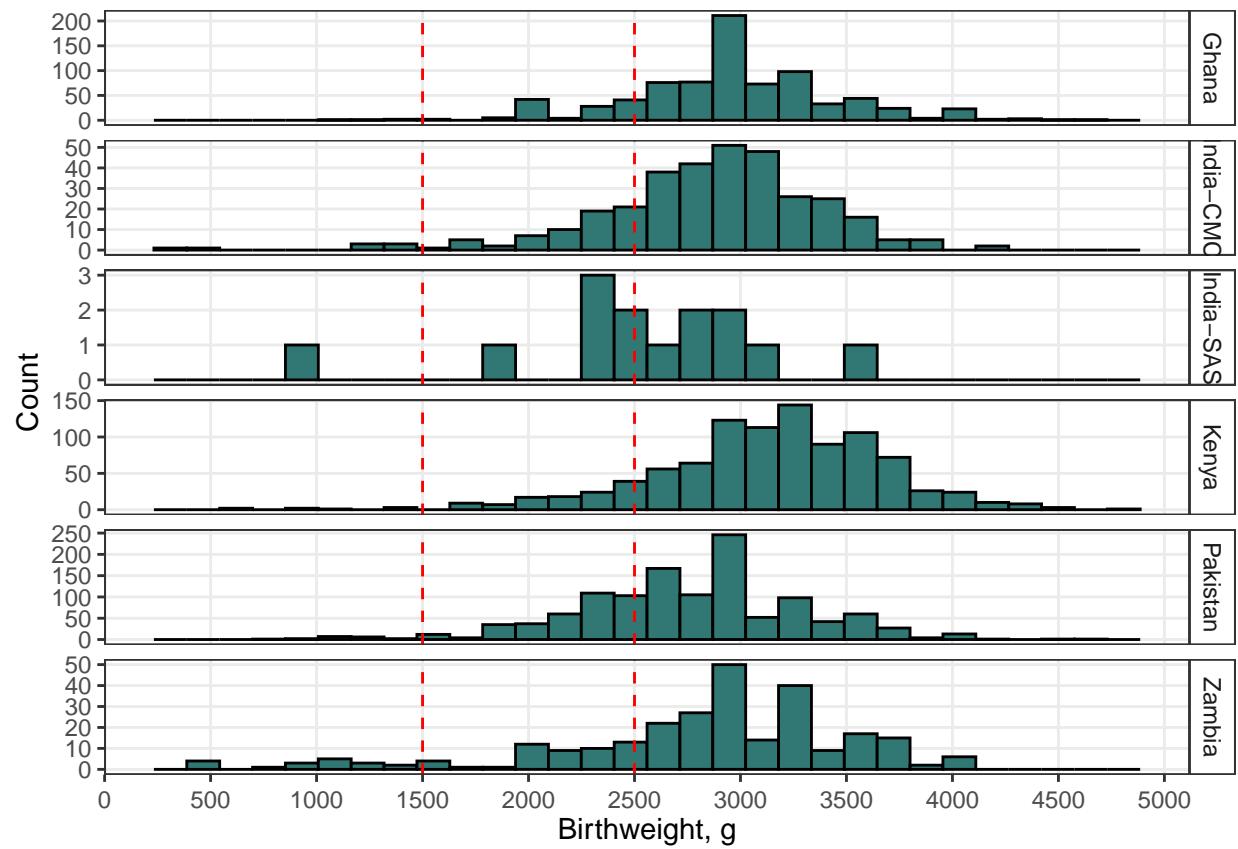


Figure 2c. Hours following birth infant was weighed across sites.

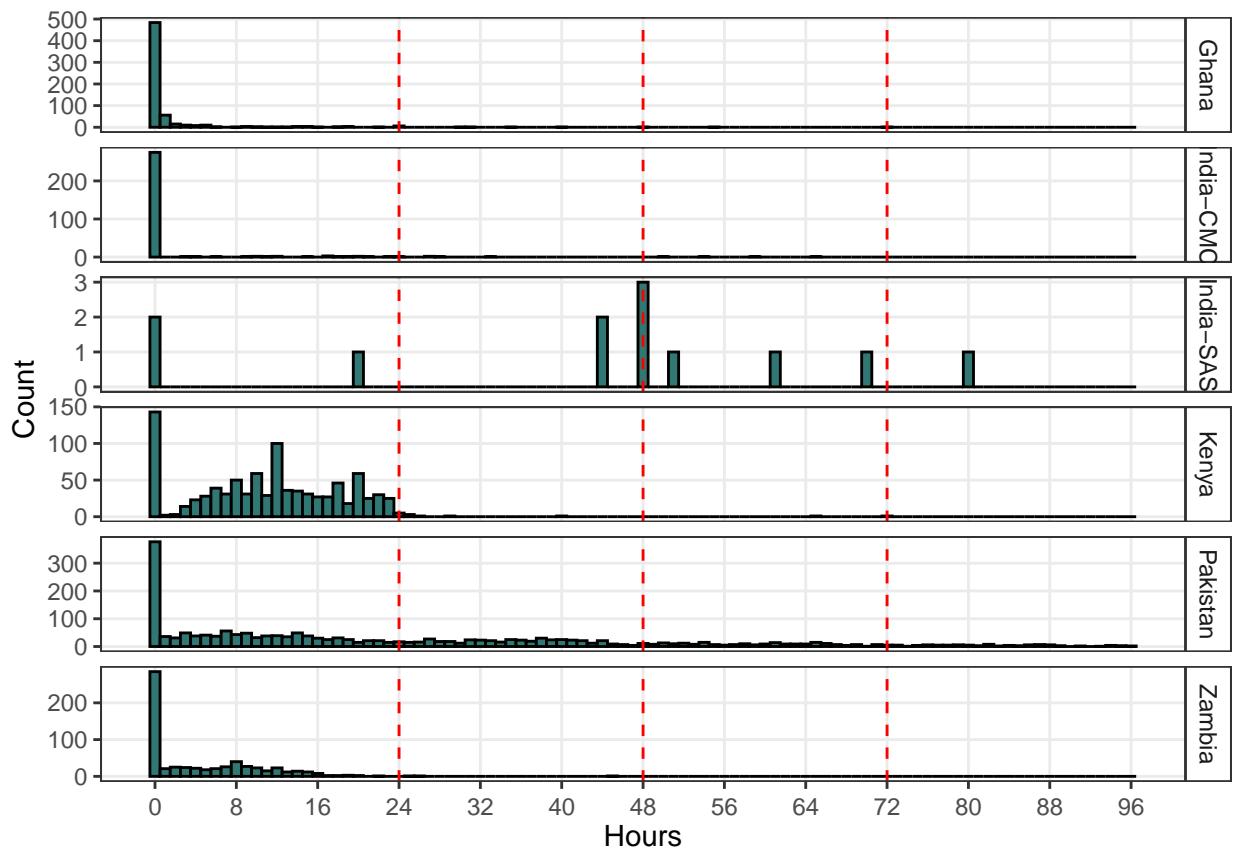


Figure 2c. Hours following birth weight measurement recorded by PRISMA-trained staff (or Facility reported where PRISMA measurement not available). Report of “0” indicates the measurement was taken <1hr following birth. Dashed lines represent 24, 48, and 72 hour time points.

3. Gestational age at delivery

Definition: Preterm delivery prior to 37 completed weeks of gestation. Further classified as: extremely preterm (<28 weeks), very preterm (28 to <32 weeks), moderate preterm (32 to <34 weeks), late preterm (34 to <37 weeks), term (37 to <41 weeks), and postterm (>41 weeks).

Denominator: All participants with delivery after 20 weeks with a MNH09 form filled out with a reported “birth outcome” (BIRTH_DSTERM_INF1-4=1 OR BIRTH_DSTERM_INF1-4=2 [MNH09]) AND has valid gestational age reported in MNH01 (US_GA_WKS_AGE_FTS1-4 [MNH01], US_GA_DAYS_AGE_FTS1-4 [MNH01], GA_LMP_WEEKS_SCORRES [MNH01]). Preterm delivery includes live or stillbirths; preterm birth includes only livebirths.

Note: Gestational age information collected in MNH01 is used to generate best obstetric estimates for EDD. These constructed variables are then used to calculate GA at time of birth.

To be included as “non-Missing” for this outcome, a participant must have:

1. Reported gestational age by either LMP or Ultrasound (varnames [form]: US_GA_WKS_AGE_FTS1-4 [MNH01], US_GA_DAYS_AGE_FTS1-4 [MNH01], GA_LMP_WEEKS_SCORRES [MNH01]).
2. Valid enrollment ultrasound visit date (varname: US_OHOSTDAT [MNH01])
3. Valid date of birth (varname: DELIV_DSSTDAT_INF1-4 [MNH09]).
4. Birth outcome reported as a “Live birth” or “Fetal death” (varname: BIRTH_DSTERM_INF1-4 [MNH09]).

Common causes for a participant to be marked as “Missing”:

- Participant is missing a reported GA by Ultrasound AND GA by LMP in MNH01.
- Participant has multiple or is missing an enrollment ultrasound visit (TYPE_VISIT=1).
- Default value is used for enrollment ultrasound visit date (US_OHOSTDAT=07-07-1907).
- Birth outcome is reported as “77, Not applicable”.

Table 3. Preterm delivery & preterm birth

Table 3						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data Completeness [MNH01] (among participants with a birth outcome)						
Denominator	931	351	22	1033	2290	758
Missing both US and LMP GA, n (%)	0 (0)	0 (0)	0 (0)	2 (0.19)	0 (0)	0 (0)
BOE = Ultrasound, n (%)	921 (99)	351 (100)	22 (100)	746 (72)	1901 (83)	583 (77)
BOE = LMP, n (%)	10 (1.1)	0 (0)	0 (0)	285 (28)	389 (17)	175 (23)
Preterm birth severity (livebirths) (categorical), n (%)						
Denominator	911	340	17	996	2218	731
Extremely preterm (<28wks)	0 (0)	2 (0.59)	0 (0)	6 (0.6)	14 (0.63)	7 (0.96)
Very preterm (28 to <32wks)	8 (0.88)	3 (0.88)	0 (0)	6 (0.6)	29 (1.3)	17 (2.3)
Moderate preterm (32 to <34wks)	6 (0.66)	5 (1.5)	1 (5.9)	9 (0.9)	44 (2)	19 (2.6)
Late preterm (34 to <37wks)	45 (4.9)	29 (8.5)	5 (29)	76 (7.6)	420 (19)	61 (8.3)
Term (37 to <41wks)	727 (80)	298 (88)	11 (65)	729 (73)	1640 (74)	544 (74)
Postterm (>=41wks)	125 (14)	3 (0.88)	0 (0)	169 (17)	71 (3.2)	83 (11)
Preterm delivery severity (live & stillbirths) (categorical), n (%)						
Denominator	931	351	22	1033	2290	758
Extremely preterm (<28wks)	6 (0.64)	12 (3.4)	2 (9.1)	24 (2.3)	31 (1.4)	18 (2.4)
Very preterm (28 to <32wks)	9 (0.97)	3 (0.85)	3 (14)	11 (1.1)	42 (1.8)	20 (2.6)
Moderate preterm (32 to <34wks)	8 (0.86)	5 (1.4)	1 (4.5)	10 (0.97)	49 (2.1)	23 (3)
Late preterm (34 to <37wks)	47 (5)	30 (8.6)	5 (23)	82 (7.9)	437 (19)	63 (8.3)
Term (37 to <41wks)	731 (79)	298 (85)	11 (50)	733 (71)	1658 (72)	549 (72)
Postterm (>=41wks)	128 (14)	3 (0.85)	0 (0)	171 (17)	72 (3.1)	84 (11)

Figure 3a. Distribution of days difference between GA by US and GA by LMP reporting across sites.

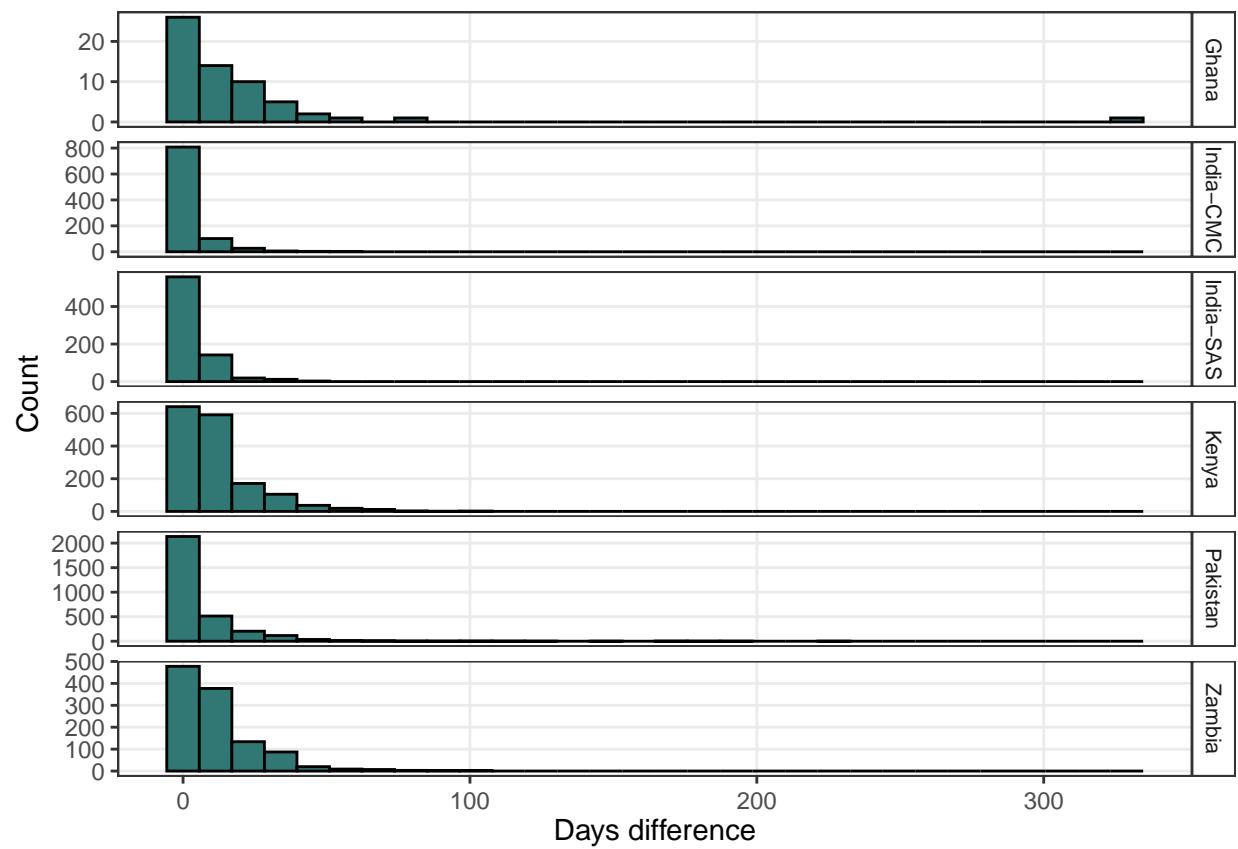


Figure 3b. Distribution of gestational age at birth in weeks.

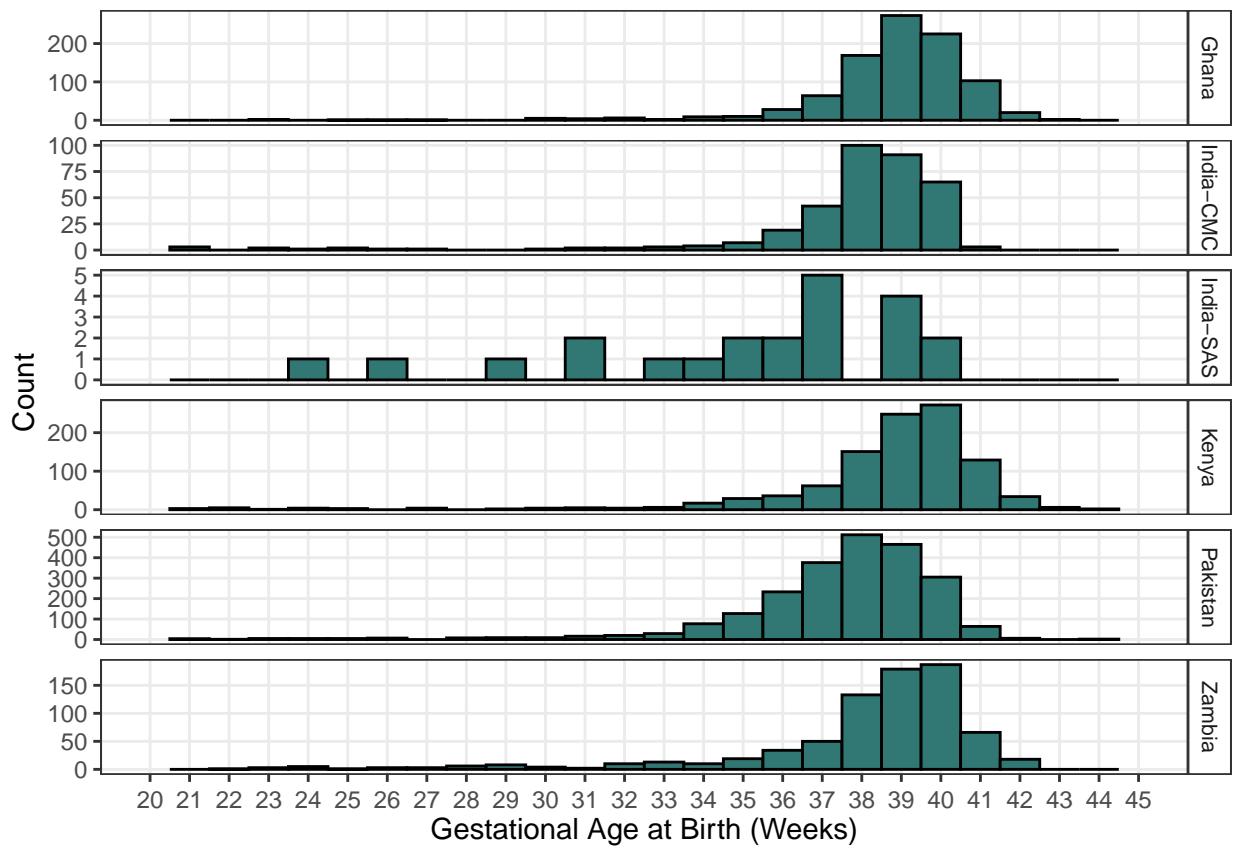


Figure 3b. Gestational age at birth was calculated by taking the difference between the DOB and “estimated conception date” determined by BOE.

Figure 3c. Proportion of stillbirths and livebirths among all deliveries by gestational age where each week of gestation totals to 100% percent.

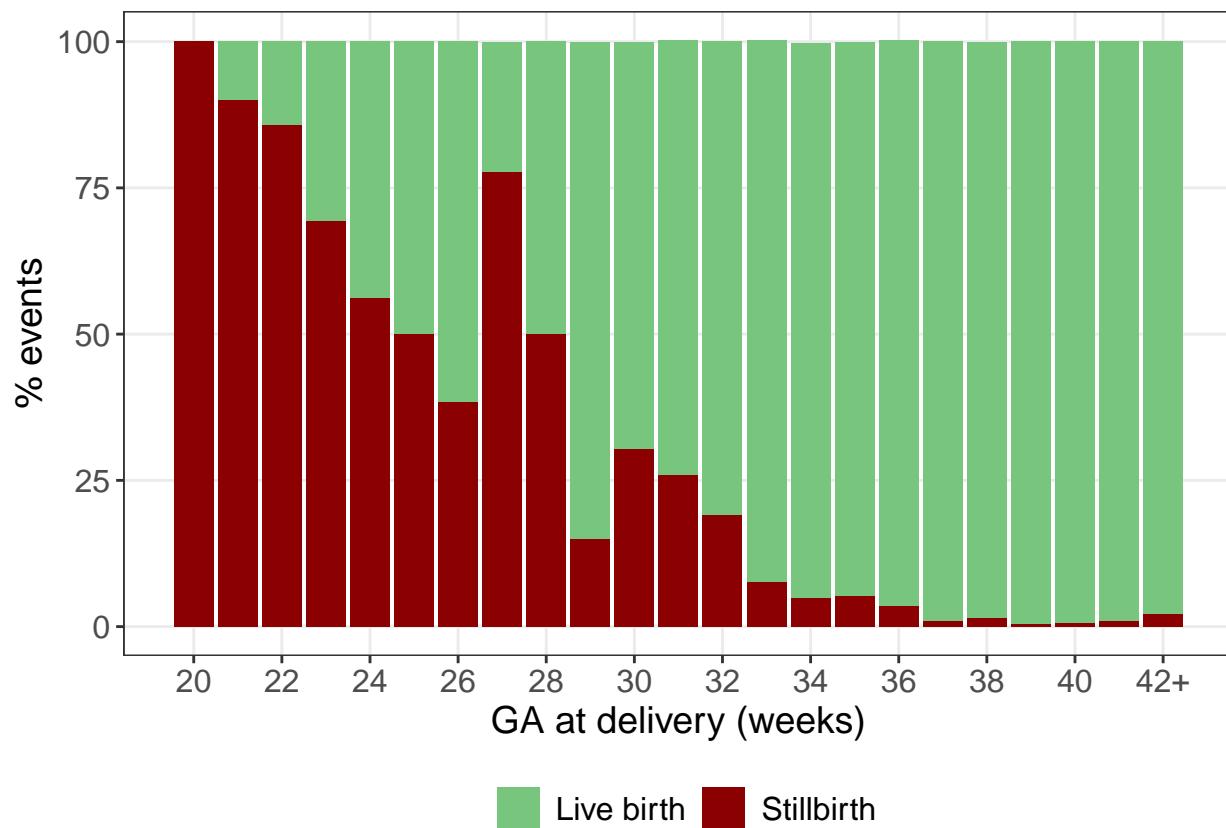
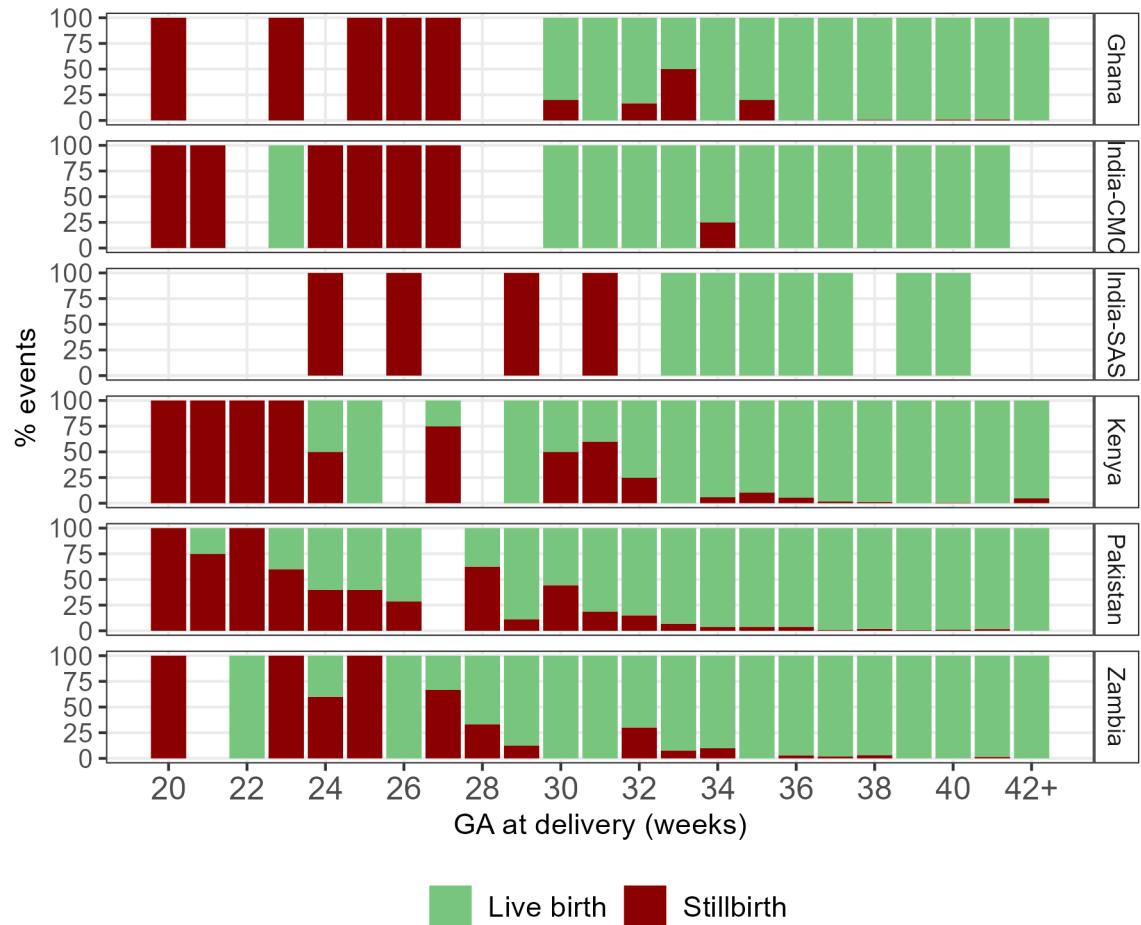


Figure 3d. By site, proportion of stillbirths and livebirths among all deliveries by gestational age where each week of gestation totals to 100% percent.



4. Size for gestational age (SGA/LGA)

Definition: GA & sex-specific birthweight percentiles per INTERGROWTH standard. Further classified as <3rd, 3rd to 10th, 10th to <90th, >=90th.

Denominator: All live births reported in MNH09.

Note: Gestational age information collected in MNH01 is used to generate best obstetric estimates for EDD. These constructed variables are then used to calculate GA at time of birth.

To be included as “non-Missing” for this outcome, a participant must have:

1. Reported gestational age by either LMP or Ultrasound (varnames [form]: US_GA_WKS_AGE_FTS1-4 [MNH01], US_GA_DAYS_AGE_FTS1-4 [MNH01], GA_LMP_WEEKS_SCORRES [MNH01]).
2. Valid date of birth (varname: DELIV_DSSTDAT_INF1-4 [MNH09]).
3. Birthweight measured by PRISMA staff <72 hours following birth OR facility reported birthweight where PRISMA not available (varnames [form]: BW_EST_FAORRES [MNH11], BW_FAORRES [MNH11], BW_FAORRES_REPORT [MNH11]).
4. Live birth (varname: BIRTH_DSTERM_INF1-4 [MNH09]).
5. Sex of infant (varname: SEX_INF1-4 [MNH09]).

Common causes for a participant to be marked as “Missing”:

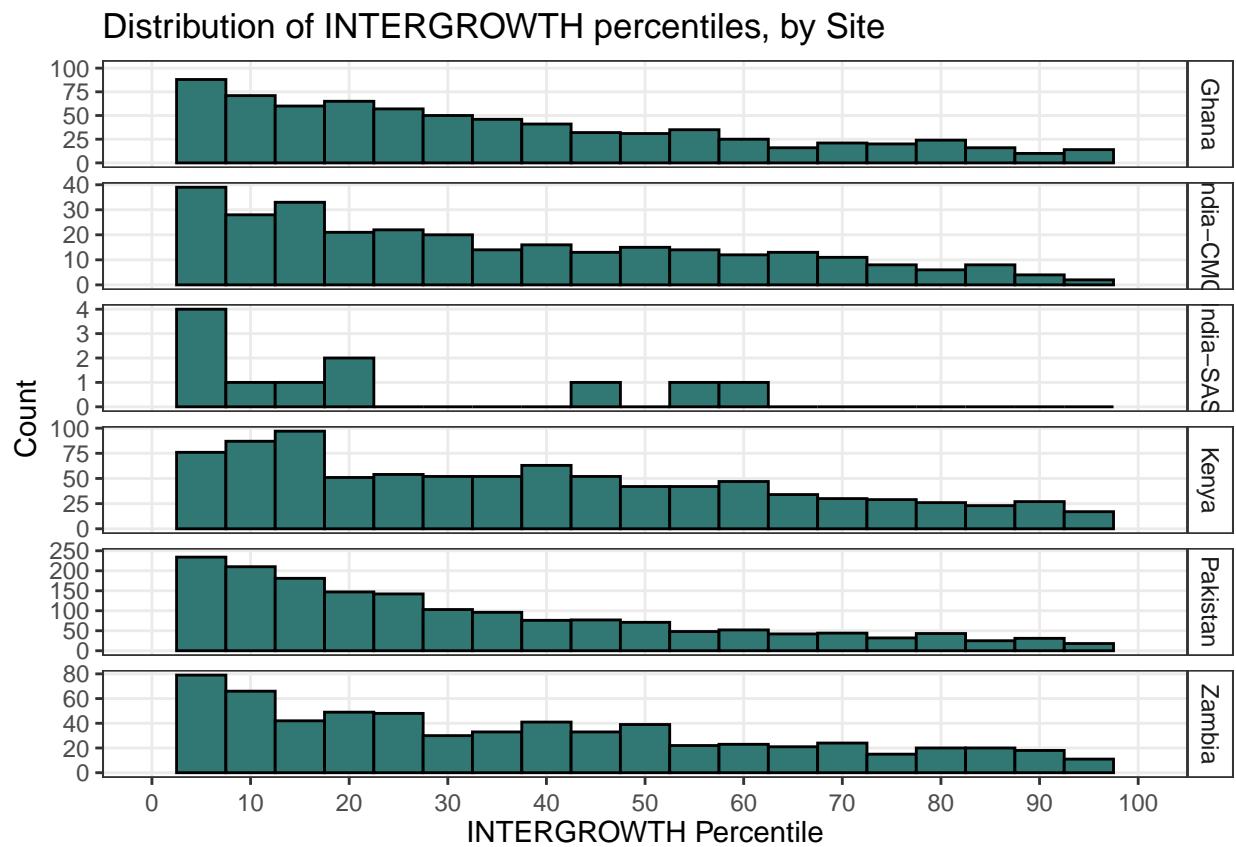
- Participant is missing a reported GA by Ultrasound AND GA by LMP in MNH01.
- Participant is missing an enrollment ultrasound visit (TYPE_VISIT=1).
- PRISMA-measured AND Facility-reported birthweights are missing from MNH11.
- MNH11 forms missing for infants (i.e. infantid present in MNH09, but is missing an MNH11 form).
- Gestational age at birth less than 33 weeks or over 42 weeks.
- INFANTID in MNH09 (INFANTID_INF1-4) that can be linked to MNH11 (INFANTID).

Table 4. Size for gestational age at birth

Table 4						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Size for Gestational Age (Categorical) ^a , n (%)						
Denominator	831	329	14	982	1920	704
SGA <3rd percentile	103 (12)	28 (8.5)	3 (21)	78 (7.9)	244 (13)	65 (9.2)
SGA 3rd to <10th percentile	118 (14)	50 (15)	5 (36)	105 (11)	323 (17)	106 (15)
AGA 10th to <90th percentile	585 (70)	246 (75)	6 (43)	764 (78)	1319 (69)	507 (72)
LGA >= 90th percentile	25 (3)	5 (1.5)	0 (0)	35 (3.6)	34 (1.8)	26 (3.7)

^c Denominator is all live births reported in MNH09.

Figure 4. Distribution of INTERGROWTH percentiles across sites.



5. Mortality

Definition: Death of a liveborn baby. Further stratified as neonatal mortality (death of a liveborn baby in the first 28 days of life) and infant mortality (death of a liveborn baby in the first 365 days of life).

Denominator: All live births with MNH09 and MNH11 filled out AND have passed the risk period with a visit OR died within the risk period.

To be included as “non-Missing” for this outcome, a participant must have:

1. Valid date of birth (varname: DELIV_DSSTDAT_INF1-4 [MNH09]).
2. Birth outcome reported as “live birth” (varname: BIRTH_DSTERM [MNH09])

Table 5. Mortality

Table 5						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data Completeness ^a						
Denominator	911	340	17	996	2218	731
Missing MNH09 (but has MNH11 or MNH24)	17 (1.8)	0 (0)	1 (4.3)	2 (0.19)	1 (0.04)	1 (0.13)
Missing MNH11 (but has MNH09 or MNH24)	37 (3.9)	0 (0)	4 (17)	2 (0.19)	1 (0.04)	1 (0.13)
Death reported but missing date or time of death ^b	0 (0)	0 (0)	0 (0)	0 (0)	6 (5)	5 (13)
Death reported but date or time of death is before delivery ^b	0 (0)	0 (0)	0 (0)	0 (0)	2 (1.6)	1 (2.6)
Timing of Neonatal Mortality ^c						
Denominator	810	268	1	886	2054	679
Death <24 hrs of life	0 (0)	2 (0.75)	0 (0)	6 (0.68)	16 (0.78)	6 (0.88)
Death 24 hrs to <7 days of life	0 (0)	0 (0)	0 (0)	1 (0.11)	41 (2)	7 (1)
Death 7 days to <28 days of life	0 (0)	1 (0.37)	0 (0)	0 (0)	19 (0.93)	4 (0.59)
Total neonatal deaths	0 (0)	3 (1.1)	0 (0)	7 (0.79)	76 (3.7)	17 (2.5)
Timing of Infant Mortality ^d						
Denominator	0	0	0	56	297	8
Death <365 days of life	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total infant deaths	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

^a Denominator is all live births.

^b Denominator is all reported deaths.

^c Denominator is all live births with MNH09 and MNH11 filled out AND have passed the risk period with a visit OR died within the risk period (risk period: age = 28days).

^d Denominator is all live births with MNH09 and MNH11 filled out AND have passed the risk period (risk period: age = 365days).

6. Stillbirth

Definition: Death prior to delivery of a fetus at ≥ 20 weeks of gestation, excluding induced abortions.

Denominator: All infants with a birth outcome reported in MNH04 (PRG_DSDECOD) or MNH09 (BIRTH_DSTERM).

To be included as “non-Missing” for this outcome, a participant must have:

1. Valid date of birth OR valid fetal loss date (varname: FETAL_LOSS_DSSTDAT [MNH04] OR DELIV_DSSTDAT_INF1-4 [MNH09]).
2. Birth outcome reported in MNH04 or MNH11 (varname: PRG_DSDECOD [MNH04] OR BIRTH_DSTERM [MNH09])
3. Reported gestational age by either LMP or Ultrasound (varnames [form]: US_GA_WKS AGE_FTS1-4 [MNH01], US_GA_DAYS AGE_FTS1-4 [MNH01], GA_LMP_WEEKS_SCORRES [MNH01]).

Table 6. Stillbirth

Table 6						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data completeness ^{a b}						
Denominator	931	351	22	1033	2290	758
Fetal loss or fetal death reported but missing signs of life (NA or 77 reported) ^{a b}	2 (11)	1 (9.1)	2 (40)	37 (95)	0 (0)	0 (0)
Stillbirth (categorical) ^c						
Denominator	929	351	22	1033	2289	757
Early stillbirth (20-27wks)	8 (0.86)	10 (2.8)	2 (9.1)	21 (2)	17 (0.74)	11 (1.4)
Late stillbirth (28-36wks)	5 (0.54)	1 (0.28)	3 (14)	12 (1.2)	35 (1.5)	9 (1.2)
Term stillbirth (>=37wks)	5 (0.54)	0 (0)	0 (0)	6 (0.58)	19 (0.83)	6 (0.79)
Total stillbirths reported	18 (1.9)	11 (3.1)	5 (23)	39 (3.8)	71 (3.1)	26 (3.4)
Timing of stillbirth ^d						
Denominator	18	11	5	39	71	26
Antepartum	15 (83)	10 (91)	3 (60)	34 (87)	71 (100)	17 (65)
Intrapartum	0 (0)	0 (0)	0 (0)	2 (5.1)	0 (0)	2 (7.7)
Don't Know	3 (17)	1 (9.1)	2 (40)	3 (7.7)	0 (0)	7 (27)

^a Denominator is all participants with a birth outcome reported in MNH09.

^b Valid signs of life reported in MNH09 and MNH11 (varname: 'CRY_CEOCCUR_INF1-4 [MNH09]', 'FHR_VSTAT_INF1-4 [MNH09]', 'MACER_CEOCCUR_INF1-4 [MNH09]', 'CORD_PULS_CEOCCUR_INF1-4 [MNH09]', 'BREATH_FAIL_CEOCCUR [MNH11]').

^c Denominator is all participants with a birth outcome ('BIRTH_DSTERM=1 or 0 [MNH09]' OR 'PRG_DSDECOD=2 or 3 [MNH04]').

^d Denominator is all reported stillbirths.

7. Fetal death

Definition: Death prior to delivery of a fetus at any gestational age.

Denominator: All infants with a fetal loss reported in MNH04 (PRG_DSDECOD) or birth outcome in MNH09 (BIRTH_DSTERM_INF1).

To be included as “non-Missing” for this outcome, a participant must have:

1. Valid date of birth OR valid fetal loss date (varname: FETAL_LOSS_DSSTDAT [MNH04] OR DELIV_DSSTDAT_INF1-4 [MNH09]).

Table 7. Fetal death

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Fetal death ^a						
Denominator	934	355	27	1086	2336	761
Stillbirth (fetal loss >=20wks)	18 (1.9)	11 (3.1)	5 (19)	39 (3.6)	71 (3)	26 (3.4)
Spontaneous abortion (fetal loss <20wks)	5 (0.54)	7 (2)	5 (19)	20 (1.8)	47 (2)	1 (0.13)
Fetal death at unknown GA	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total fetal deaths	23 (2.5)	18 (5.1)	10 (37)	59 (5.4)	118 (5)	27 (3.5)
Other fetal death ^b						
Denominator	934	358	29	1086	2336	761
Induced abortion ^c	0 (0)	3 (0.84)	2 (6.9)	0 (0)	0 (0)	0 (0)

^a Denominator is n total births excluding induced abortions

^b Denominator is n total births.

^c Induced abortion defined as an elective surgical procedure or medical intervention to terminate the pregnancy at any gestational age).

8. Perinatal birth asphyxia

Definition: Clinician reports failure to breathe spontaneously in the first minute after delivery or breathing assistance was required.

Denominator: All liveborn infants with a MNH11 form filled out.

To be included as “non-Missing” for this outcome, a participant must have:

1. Valid birth complications reported in MNH11 or MNH20 (varname: INF_PROCCUR_1-6 [MNH11])
2. Valid birth complications reported in MNH20, if applicable (varname: BIRTH_COMPL_MHTERM_3 [MNH20])

Table 8. Perinatal birth asphyxia

Table 8						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data completeness ^a						
Denominator	911	340	17	996	2218	731
Invalid birth complications in MNH11 (NA or 77 reported) ^a	2 (0.22)	0 (0)	3 (18)	0 (0)	4 (0.18)	1 (0.14)
Indicators of birth asphyxia ^a						
Denominator	911	340	17	996	2218	731
Failed to initiate and sustain breathing at birth	45 (4.9)	23 (6.8)	2 (12)	59 (5.9)	222 (10)	15 (2)
Bag and mask ventilation	20 (2.2)	6 (1.8)	0 (0)	15 (1.5)	16 (0.72)	2 (0.27)
Continuous positive airway pressure	9 (0.99)	3 (0.88)	0 (0)	2 (0.2)	11 (0.5)	38 (5.2)
Repeated stimulation/suction	64 (7)	4 (1.2)	0 (0)	11 (1.1)	2 (0.09)	19 (2.6)
Intubation and mechanical ventilation	12 (1.3)	1 (0.29)	0 (0)	0 (0)	16 (0.72)	3 (0.41)
Chest compressions	22 (2.4)	1 (0.29)	0 (0)	2 (0.2)	4 (0.18)	1 (0.14)
Perinatal birth asphyxia ^a						
Denominator	911	340	17	996	2218	731
Birth asphyxia ^b	111 (12)	29 (8.5)	2 (12)	60 (6)	223 (10)	61 (8.3)

^a Denominator is total liveborn infants with a MNH11 form filled out.

^b Defined as required any breathing assistance at birth.

9. Hyperbilirubinemia

Definition: Defined as the presence of excess bilirubin during the first week of life (delivery to 7 days of age).

Denominator: All infants with a measurement taken within the testing window.

Table 9. Hyperbilirubinemia

Table 9a					
	Ghana	India-CMC	India-SAS	Kenya	Pakistan
Hyperbilirubinemia by TCB (>15mg/dL)					
Hyperbilirubinemia <24 hrs of life	3 (0.48)	1 (0.41)	2 (100)	10 (1.1)	1 (0.16)
Hyperbilirubinemia 24 hrs to <5 days of life	58 (11)	51 (19)	3 (27)	111 (14)	95 (5.1)
Hyperbilirubinemia 5 days to <14 days of life	16 (2.6)	3 (1.4)	4 (40)	34 (3.9)	56 (3)
Total hyperbilirubinemia by TCB >15mg/dL	77 (9.1)	55 (18)	9 (47)	155 (15)	152 (7)
Hyperbilirubinemia by TCB (AAP threshold) ^a					
Hyperbilirubinemia <24 hrs of life	1 (0.16)	0 (0)	0 (0)	0 (0)	0 (0)
Hyperbilirubinemia 24 hrs to <5 days of life	22 (4)	28 (11)	1 (9.1)	31 (3.9)	51 (2.8)
Hyperbilirubinemia 5 days to <14 days of life	4 (0.65)	0 (0)	3 (30)	10 (1.2)	14 (0.75)
Total hyperbilirubinemia by AAP threshold	27 (3.2)	28 (8.9)	4 (21)	41 (4)	65 (3)
Jaundice (IMCI criteria)					
Non-severe jaundice identified at any time	36 (4.2)	32 (11)	1 (7.1)	92 (9.5)	552 (26)
Severe jaundice identified <24 hrs of life	3 (0.35)	0 (0)	0 (0)	5 (0.52)	5 (0.24)
Severe jaundice identified >=24 hrs of life	23 (2.7)	21 (7)	1 (7.1)	18 (1.9)	306 (15)
Any jaundice identified at any time	55 (6.4)	51 (17)	2 (14)	108 (11)	813 (39)

^a AAP threshold determined by the following inputs: phototherapy thresholds with no hyperbilirubinemia neurotoxicity risk factor, gestational age at delivery, and infant age at time of assessment (days and hours).

10. PSBI

Definition: Presence of any clinical signs or symptoms as defined by the WHO IMCI criteria, which are consistent with possible severe bacterial infection from delivery to 59 days.

Denominator: All livebirths aged 0-59 days.

Table 10. PSBI

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data Completeness: missing confirmatory respiratory rate measurement ^a						
IPC	12 (15)	1 (2.1)	0 (0)	5 (7)	1 (0.38)	2 (9.1)
PNC0	57 (60)	1 (2.3)	0 (0)	1 (1.8)	0 (0)	8 (30)
PNC1	0 (0)	2 (9.1)	0 (0)	0 (0)	0 (0)	9 (43)
PNC4	0 (0)	4 (33)	0 (0)	1 (6.7)	0 (0)	2 (50)
PNC6	0 (0)	0 (0)	0 (0)	1 (5.6)	0 (0)	5 (50)
Unscheduled visit	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Hospitalization visit	0 (0)	2 (10)	0 (0)	3 (17)	4 (15)	0 (0)
Data Completeness: missing confirmatory temperature measurement ^b						
IPC	7 (9)	2 (4.2)	0 (0)	10 (14)	0 (0)	5 (23)
PNC0	33 (35)	1 (2.3)	0 (0)	8 (14)	64 (39)	18 (67)
PNC1	0 (0)	0 (0)	0 (0)	4 (17)	115 (60)	9 (43)
PNC4	0 (0)	0 (0)	0 (0)	5 (33)	94 (68)	2 (50)
PNC6	0 (0)	0 (0)	0 (0)	4 (22)	30 (38)	5 (50)
Unscheduled visit	0 (0)	0 (0)	0 (0)	1 (50)	5 (100)	1 (25)
Hospitalization visit	0 (0)	18 (10)	0 (0)	16 (22)	12 (19)	0 (0)

^a Missing confirmatory respiratory rate measurements among those with a RR>=60 breaths per minute. Denominator is n total psbi cases at the specified visit.

^b Missing confirmatory temperature among those with a temperature reading >=38C or <35.5C. Denominator is n total psbi cases at the specified visit.

Table 10 continued

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
PSBI by visit ^c						
Denominator	911	340	17	996	2218	731
IPC (target window: delivery to 72 hours)	78 (8.6)	48 (14)	2 (12)	71 (7.1)	266 (12)	22 (3)
Difficulty in feeding	4	16	2	20	20	3
Convulsions	2	0	0	1	13	1
Fast breathing (RR>=60)	37	14	1	15	105	3
Severe chest in-drawing	8	5	1	14	9	14
Fever (>=38C)	16	1	0	33	37	1
Low body temperature (<35.5C)	20	20	0	5	110	4
PNC0 (target window: 3 to 5 days)	95 (10)	43 (13)	1 (5.9)	56 (5.6)	163 (7.3)	27 (3.7)
Difficulty in feeding	5	7	0	6	2	0
Convulsions	1	0	0	1	2	1
Fast breathing (RR>=60)	57	9	0	11	67	9
Severe chest in-drawing	3	2	0	6	0	1
Fever (>=38C)	27	2	0	38	39	13
Low body temperature (<35.5C)	6	26	1	7	64	6
PNC1 (target window: 7 to 14 days)	3 (0.33)	22 (6.5)	0 (0)	23 (2.3)	191 (8.6)	21 (2.9)
Difficulty in feeding	1	8	0	3	2	0
Convulsions	1	1	0	0	1	0
Fast breathing (RR>=60)	0	3	0	5	47	10
Severe chest in-drawing	1	0	0	1	0	1
Fever (>=38C)	0	3	0	17	31	5
Low body temperature (<35.5C)	0	11	0	2	115	7

^c Denominator is all livebirths aged 0-59 days.

Table 10 continued

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
PSBI by visit ^c						
PNC4 (target window: 28 to 35 days)	6 (0.66)	12 (3.5)	1 (5.9)	15 (1.5)	139 (6.3)	4 (0.55)
Difficulty in feeding	1	2	0	0	0	0
Convulsions	4	1	0	0	0	0
Fast breathing (RR>=60)	0	8	0	4	30	2
Severe chest in-drawing	1	1	0	0	3	0
Fever (>=38C)	0	0	0	9	15	0
Low body temperature (<35.5C)	0	3	1	5	94	2
PNC6 (target window: 6 to 12 weeks)	2 (0.22)	6 (1.8)	0 (0)	18 (1.8)	80 (3.6)	10 (1.4)
Difficulty in feeding	1	0	0	1	0	0
Convulsions	0	0	0	0	0	0
Fast breathing (RR>=60)	0	0	0	5	36	5
Severe chest in-drawing	1	0	0	0	5	0
Fever (>=38C)	0	2	0	12	13	0
Low body temperature (<35.5C)	0	4	0	4	30	5

^c Denominator is all livebirths aged 0-59 days.

Table 10 continued

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
PSBI by visit ^c						
Unscheduled	0 (0)	0 (0)	0 (0)	2 (0.2)	5 (0.23)	4 (0.55)
Difficulty in feeding	0	0	0	0	0	0
Convulsions	0	0	0	0	0	0
Fast breathing (RR>=60)	0	0	0	0	0	1
Severe chest in-drawing	0	0	0	0	0	2
Fever (>=38C)	0	0	0	2	0	1
Low body temperature (<35.5C)	0	0	0	0	5	1
Hospitalization	0 (0)	20 (5.9)	0 (0)	18 (1.8)	26 (1.2)	28 (3.8)
Difficulty in feeding	0	3	0	12	10	19
Convulsions	0	2	0	2	3	6
Fast breathing (RR>=60)	0	14	0	7	4	0
Severe chest in-drawing	0	0	0	6	8	9
Fever (>=38C)	0	3	0	4	5	0
Low body temperature (<35.5C)	0	2	0	1	0	0

^c Denominator is all livebirths aged 0-59 days.

11. Infant growth trajectories

Definitions:

- Underweight (Weight for Age - WAZ): Proportion of infants more than 2 standard deviations (z score) below the WHO Children Health Reference Growth Standard.
- Severely Underweight (Weight for Age - WAZ): Proportion of infants more than 3 standard deviations (z score) below the WHO Children Health Reference Growth Standard.
- Wasting (Weight for Length - WFL): Proportion of infants with more than 2 standard deviations (z score) below the WHO Children Health Reference Growth Standard.
- Severe Wasting (Weight for Length - WFL): Proportion of infants more than 3 standard deviations (z score) below the WHO Children Health Reference Growth Standard.
- Stunting (Length for Age - LAZ): Proportion of infants more than 2 standard deviations (z score) below the WHO Children Health Reference Growth Standard
- Severe Stunting (Length for Age - LAZ): Proportion of infants more than 3 standard deviations (z score) below the WHO Children Health Reference Growth Standard
- Microcephaly (Head circumference for Age - HCZ): Proportion of infants more than 3 standard deviations (z score) below the WHO Children Health Reference Growth Standard.
- Overweight (Weight for Length - WFL): Proportion of infants with more than 2 standard deviations (z score) below the WHO Children Health Reference Growth Standard.

Table 11a. Infant growth outcome at birth

Denominator: All liveborn infants who have completed the IPC visit (0-5 days) (MNH11 & MNH09) AND have all anthropometric measures AND have valid z-scores.

Table 11a	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data completeness at birth (0 – 5 days)						
Denominator ^a	908	340	14	996	2170	705
Missing birth date (MNH09)	0 (0)	0 (0)	0 (0)	1 (0.1)	0 (0)	0 (0)
Missing visit date at birth (MNH11)	34 (3.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Missing information on infant sex	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.28)
Missing information on infant length	343 (38)	60 (18)	4 (29)	64 (6.4)	97 (4.5)	118 (17)
Missing information on infant weight	75 (8.3)	9 (2.6)	0 (0)	6 (0.6)	263 (12)	21 (3)
Missing information on head circumference	211 (23)	63 (19)	4 (29)	54 (5.4)	91 (4.2)	118 (17)
Missing at least one anthropometry measurement	382 (42)	67 (20)	4 (29)	68 (6.8)	385 (18)	128 (18)
Invalid Z score ^{b c}	32 (3.5)	8 (2.4)	2 (14)	88 (8.8)	206 (9.5)	65 (9.2)

^a Denominator is total live births with MNH09 & MNH11.

^b Participants who had at least one invalid z-score measure.

^c Invalid Z-score - At least one of the z-scores has been flagged by the World Health Organization (WHO) as biologically implausible (BIV).

Table 11a continued

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Infant growth outcomes at birth (0 – 5 days) using WHO Standards						
Denominator^d	472	265	8	838	1576	506
Underweight (WAZ < -2)	32 (6.8)	28 (11)	1 (12)	43 (5.1)	206 (13)	29 (5.7)
Severe underweight (WAZ <-3)	5 (1.1)	2 (0.75)	0 (0)	2 (0.24)	17 (1.1)	4 (0.79)
Wasting (WFL < -2)	111 (24)	28 (11)	2 (25)	53 (6.3)	118 (7.5)	98 (19)
Severe wasting (WFL < -3)	43 (9.1)	4 (1.5)	0 (0)	15 (1.8)	27 (1.7)	34 (6.7)
Stunting (LAZ < -2)	31 (6.6)	26 (9.8)	2 (25)	71 (8.5)	207 (13)	25 (4.9)
Severe Stunting (LAZ < -3)	0 (0)	1 (0.38)	0 (0)	0 (0)	0 (0)	0 (0)
Overweight (WFL > 3)	13 (2.8)	2 (0.75)	0 (0)	54 (6.4)	11 (0.7)	17 (3.4)
Microcephaly (HCZ < -3)	13 (2.8)	2 (0.75)	0 (0)	2 (0.24)	27 (1.7)	3 (0.59)
Infant growth outcomes at birth (0 – 5 days) using Intergrowth Standard (adjusting for preterm deliveries)						
Underweight (WAZ < -2)	36 (7.6)	10 (3.8)	1 (12)	35 (4.2)	115 (7.3)	29 (5.7)
Severe underweight (WAZ <-3)	0 (0)	0 (0)	0 (0)	1 (0.12)	9 (0.57)	0 (0)
Wasting (WFL < -2)	55 (12)	13 (4.9)	1 (12)	41 (4.9)	110 (7)	42 (8.3)
Severe wasting (WFL < -3)	5 (1.1)	1 (0.38)	0 (0)	1 (0.12)	11 (0.7)	2 (0.4)
Stunting (LAZ < -2)	19 (4)	9 (3.4)	0 (0)	51 (6.1)	55 (3.5)	22 (4.3)
Severe Stunting (LAZ < -3)	1 (0.21)	0 (0)	0 (0)	1 (0.12)	1 (0.06)	0 (0)
Overweight (WFL > 3)	5 (1.1)	2 (0.75)	0 (0)	10 (1.2)	11 (0.7)	6 (1.2)
Microcephaly (HCZ < -3)	5 (1.1)	0 (0)	0 (0)	2 (0.24)	1 (0.06)	3 (0.59)

^d All living infants who have completed the IPC visit (0-5 days) (have M NH11 & M NH09) AND have all anthropometric measures AND have valid z-scores.

Table 11b. Infant growth outcome at one month

Denominator: All liveborn infants who have completed at least one visit at one month (21-42 days) of age, AND have all required anthropometric measurements, AND possess valid z-scores.

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data completeness at one month (21 to 42 days)						
Denominator^a	628	196	1	853	1765	623
Missing information on infant length	3 (0.48)	9 (4.6)	0 (0)	1 (0.12)	4 (0.23)	117 (19)
Missing information on infant weight	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Missing information on head circumference	1 (0.16)	7 (3.6)	0 (0)	1 (0.12)	2 (0.11)	106 (17)
Missing at least one anthropometry measurement	3 (0.48)	9 (4.6)	0 (0)	1 (0.12)	4 (0.23)	120 (19)
Invalid Z score ^{b c}	19 (3)	7 (3.6)	0 (0)	14 (1.6)	99 (5.6)	14 (2.2)

^a Denominator is any infant who have completed any visit within 21 to 42 days.

^b Participants who had at least one invalid z-score measure.

^c Invalid Z-score - At least one of the z-scores has been flagged by the World Health Organization (WHO) as biologically implausible (BIV).

Table 11b continued

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Infant growth outcomes in the first month of life using WHO Growth Standards						
Denominator^d	606	180	1	838	1659	488
Underweight (WAZ < -2)	41 (6.8)	26 (14)	0 (0)	26 (3.1)	342 (21)	33 (6.8)
Severe underweight (WAZ <-3)	15 (2.5)	5 (2.8)	0 (0)	6 (0.72)	104 (6.3)	8 (1.6)
Wasting (WFL < -2)	84 (14)	26 (14)	0 (0)	37 (4.4)	229 (14)	55 (11)
Severe wasting (WFL < -3)	36 (5.9)	7 (3.9)	0 (0)	12 (1.4)	64 (3.9)	15 (3.1)
Stunting (LAZ < -2)	34 (5.6)	17 (9.4)	0 (0)	49 (5.8)	304 (18)	52 (11)
Severe Stunting (LAZ < -3)	6 (0.99)	5 (2.8)	0 (0)	9 (1.1)	74 (4.5)	8 (1.6)
Overweight (WFL > 3)	6 (0.99)	1 (0.56)	0 (0)	50 (6)	36 (2.2)	38 (7.8)
Microcephaly (HCZ < -3)	3 (0.5)	2 (1.1)	0 (0)	3 (0.36)	55 (3.3)	2 (0.41)
Infant growth outcomes in the first month of life using Intergrowth Standard (adjusting for preterm deliveries)						
Underweight (WAZ < -2)	41 (6.8)	26 (14)	0 (0)	26 (3.1)	342 (21)	33 (6.8)
Severe underweight (WAZ <-3)	15 (2.5)	5 (2.8)	0 (0)	6 (0.72)	104 (6.3)	8 (1.6)
Wasting (WFL < -2)	84 (14)	26 (14)	0 (0)	37 (4.4)	229 (14)	55 (11)
Severe wasting (WFL < -3)	36 (5.9)	7 (3.9)	0 (0)	12 (1.4)	64 (3.9)	15 (3.1)
Stunting (LAZ < -2)	34 (5.6)	17 (9.4)	0 (0)	49 (5.8)	304 (18)	52 (11)
Severe Stunting (LAZ < -3)	6 (0.99)	5 (2.8)	0 (0)	9 (1.1)	74 (4.5)	8 (1.6)
Overweight (WFL > 3)	6 (0.99)	1 (0.56)	0 (0)	50 (6)	36 (2.2)	38 (7.8)
Microcephaly (HCZ < -3)	3 (0.5)	2 (1.1)	0 (0)	3 (0.36)	55 (3.3)	2 (0.41)

^d All living infants who have completed at least one visit at one month (21-42 days) of age, AND have all required anthropometric measurements, AND possess valid z-scores.

Table 11c. Infant growth outcome at six months

Denominator: All liveborn infants who have completed at least one visit at six months of age (171-222 days) AND have all required anthropometric measurements AND possess valid z-scores.

Table 11c						
	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Data completeness at six months (171 to 222 days)						
Denominator ^a	77	2	0	455	1229	288
Missing information on infant length	2 (2.6)	0 (0)	0 (0)	1 (0.22)	2 (0.16)	70 (24)
Missing information on infant weight	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Missing information on head circumference	3 (3.9)	0 (0)	0 (0)	1 (0.22)	1 (0.08)	43 (15)
Missing at least one anthropometry measurement	3 (3.9)	0 (0)	0 (0)	1 (0.22)	2 (0.16)	70 (24)
Invalid Z score ^{b c}	4 (5.2)	0 (0)	0 (0)	6 (1.3)	70 (5.7)	7 (2.4)

^a Denominator is any infant who have completed any visit within 171 to 222 days.

^b Participants who had at least one invalid z-score measure.

^c Invalid Z-score - At least one of the z-scores has been flagged by the World Health Organization (WHO) as biologically implausible (BIV).

Table 11c continued

	Ghana	India-CMC	India-SAS	Kenya	Pakistan	Zambia
Infant growth outcomes at six months using WHO Growth Standards						
Denominator^d	70	2	0	448	1154	211
Underweight (WAZ < -2)	9 (13)	0 (0)	0 (0)	32 (7.1)	369 (32)	15 (7.1)
Severe underweight (WAZ <-3)	2 (2.9)	0 (0)	0 (0)	10 (2.2)	129 (11)	3 (1.4)
Wasting (WFL < -2)	7 (10)	0 (0)	0 (0)	19 (4.2)	199 (17)	25 (12)
Severe wasting (WFL < -3)	1 (1.4)	0 (0)	0 (0)	3 (0.67)	72 (6.2)	8 (3.8)
Stunting (LAZ < -2)	9 (13)	0 (0)	0 (0)	35 (7.8)	292 (25)	41 (19)
Severe Stunting (LAZ < -3)	1 (1.4)	0 (0)	0 (0)	9 (2)	90 (7.8)	6 (2.8)
Overweight (WFL > 3)	2 (2.9)	0 (0)	0 (0)	21 (4.7)	14 (1.2)	21 (9.9)
Microcephaly (HCZ < -3)	0 (0)	0 (0)	0 (0)	0 (0)	86 (7.4)	2 (0.95)
Infant growth outcomes at six months using Intergrowth Standard (adjusting for preterm deliveries)						
Underweight (WAZ < -2)	9 (13)	0 (0)	0 (0)	25 (5.6)	317 (27)	14 (6.6)
Severe underweight (WAZ <-3)	2 (2.9)	0 (0)	0 (0)	6 (1.3)	112 (9.7)	3 (1.4)
Wasting (WFL < -2)	7 (10)	0 (0)	0 (0)	19 (4.2)	199 (17)	25 (12)
Severe wasting (WFL < -3)	1 (1.4)	0 (0)	0 (0)	3 (0.67)	72 (6.2)	8 (3.8)
Stunting (LAZ < -2)	9 (13)	0 (0)	0 (0)	28 (6.2)	244 (21)	36 (17)
Severe Stunting (LAZ < -3)	1 (1.4)	0 (0)	0 (0)	5 (1.1)	72 (6.2)	5 (2.4)
Overweight (WFL > 3)	2 (2.9)	0 (0)	0 (0)	21 (4.7)	14 (1.2)	21 (9.9)
Microcephaly (HCZ < -3)	0 (0)	0 (0)	0 (0)	0 (0)	79 (6.8)	1 (0.47)

^d All living infants who have completed at least one visit at six months of age (171-222 days) AND have all required anthropometric measurements AND possess valid z-scores.

Infant growth visualizations

The following distributions visualizes the mean Length for Age (LAZ), Weight for Age (WAZ) and Head Circumference (HC) Z-scores by site

Z-scores were generated using the

1. Intergrowth Standard
2. WHO Standard

For IPC Visits, the Intergrowth package calculates Z-scores for all infants based on the Gestational Age at birth. However, for subsequent visits, the Intergrowth package ONLY ADJUSTS FOR PRETERM babies. This adjustment is only available for;

- Weight for Age
- Length for Age
- Head Circumference for Age

There is no r-package available to adjust for preterm Weight-for-Length z-score after birth

PRISMA Visit Windows:

Birth: Initial measurement at birth;

PNC-4: Postnatal check at 28-35 days;

PNC-6: Postnatal check at 6-12 weeks;

PNC-26: Postnatal check at 26-39 weeks;

PNC-52: Postnatal check at 52-64 weeks.

Abbreviations:

LAZ: Length-for-Age Z-score, **WAZ:** Weight-for-Age Z-score,

WLF: Weight-for-length, **HC:** Head Circumference

Figure 5: Mean infant growth measures by PRISMA PNC visit windows across sites.

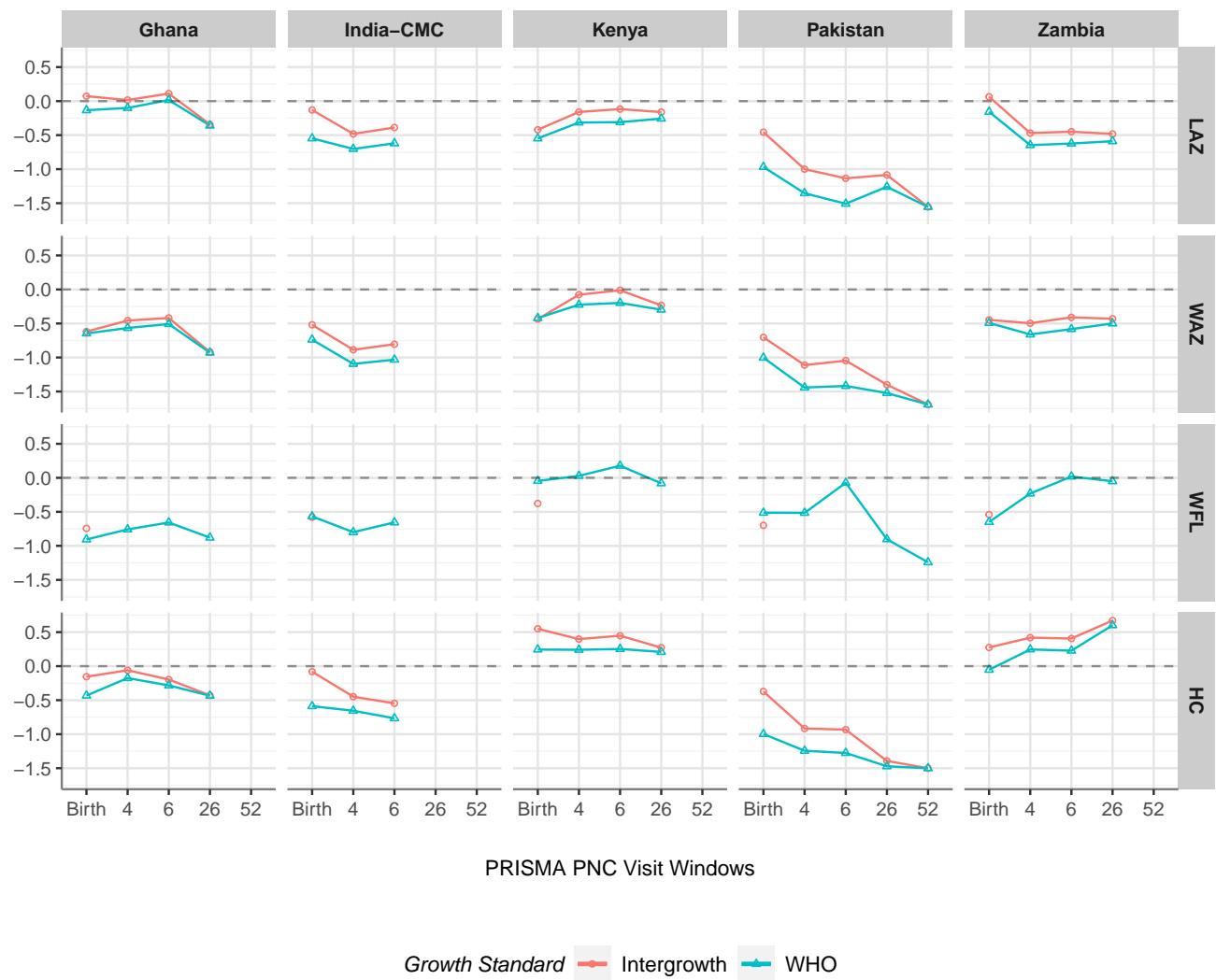


Figure 6: cumulative change in stunting across PRISMA PNC visit windows

Definitions of stunting status categories

1. **Never Stunted:** Children who have never been stunted at any recorded time point .
2. **No Longer Stunting:** Children who were previously stunted but are not stunted in the current time point.
3. **Newly Stunted:** Children who were not stunted in the previous time point but are stunted in the current time point.
4. **Still Stunted:** Children who remain stunted across consecutive time points.
5. **Increased Stunting:** Children who were stunted in the previous time point and have transitioned to severe stunting.
6. **Stunting Relapse:** Children who were not stunted previously, then stunted, recovered, and are stunted again.

