UNIVERSITY OF GHANA

GLOBAL FINANCING FACILITY

African Population and Health Research Center

Countdown to 2030 Women's Children's & Adolescent's Health

Maternal and Newborn Health (MNH) Strategies for Essential and Emergency Obstetric and Newborn Care

Countdown to 2030 Multi-country Analysis Project

GHANA SYNTHESIS REPORT

DECEMBER

2023

Maternal and newborn health (MNH) strategies for essential and emergency obstetric and newborn care

Countdown to 2030 multi-country analysis project

Phase 1 Synthesis Report for Ghana

December 2023

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Countdown Country Collaboration

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Abbreviations

CS: Cesarean Section
DHS: Demographic and Health Survey
HMIS: Health Management Information System
NMR: Neonatal mortality rate
MICS: Multiple Indicator Cluster Survey
MNH: Maternal and Newborn Health
WHO: World Health Organization

Background

Good-quality obstetric and newborn care in health facilities is central to reducing maternal and neonatal deaths and stillbirths, and to improving future health of women and children. Globally, institutional births have increased dramatically, but places where births occur vary enormously and are not well understood. Simply increasing coverage of institutional births is very unlikely to reduce mortality if facilities lack basic requirements for emergency obstetric and neonatal care, have inadequate staffing, or cannot refer in emergencies. [1] [2] In many parts of sub-Saharan Africa, births have mostly increased in lower-level facilities, probably because these facilities are closer to where women live.[3] These facilities tend to have low volumes of births (few births each month) and to have lower "readiness" to provide care, in part because they are lower-level, so for example, they are not expected to perform certain procedures such as caesarean section. [4] In addition, such facilities are often less ready to perform even those functions they are meant to, may be less supplied with commodities and drugs and are often less supervised.

Larger facilities, notably hospitals, are fewer but have larger volumes, more and better-trained staff and equipment, and are more likely to be able to provide emergency care. Poor-quality obstetric care in lower-level facilities has led some to recommend a policy for hospital births rather than in dispensaries or clinics, though there is no global consensus on where women should deliver.[5] Country and cross-country evidence is needed to understand the tension between Maternal and Newborn Health (MNH) care provided at physically close but low-capacity facilities, versus further away but higher capacity facilities and to inform national and global decisions on future strategies for MNH service organization and resourcing.

This MNH multi-country analysis project aims to better characterize the environment of births over time, using quantitative analyses to describe trends over time in where and with whom women deliver by level and public/private sector, by what mode (vaginal or C-section) nationally, and by rural-urban, wealth, region/province, as well as neonatal mortality and stillbirths. This will be contextualized by assessing country's policies and health systems data related to the organization and integration of delivery care services at different levels and sectors.

This report is on Ghana. The synthetic analyses in this report will position the study results within a maternal, stillbirth and neonatal mortality transition model to aid comparative analysis and

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[1] Elmusharaf, K., et al., *Patterns and determinants of pathways to reach comprehensive emergency obstetric and neonatal care (CEmONC) in South Sudan: qualitative diagrammatic pathway analysis.* BMC Pregnancy and Childbirth, 2017. **17**(1): p. 278.

[2] Cavallaro, F.L. and T.J. Marchant, *Responsiveness of emergency obstetric care systems in low-and middle-income countries: A critical review of the "third delay".* Acta obstetricia et gynecologica Scandinavica, 2013. **92**(5): p. 496-507.

[3] Kruk, M.E., et al., *High-quality health systems in the Sustainable Development Goals era: time for a revolution.* The Lancet Global Health, 2018. **6**(11): p. e1196-e1252.

[4] Kruk, M.E., et al., *Quality of basic maternal care functions in health facilities of five African countries: an analysis of national health system surveys.* The Lancet Global Health, 2016. **4**(11): p. e845-e855.

[5] Fink, G. and J. Cohen, *Delivering quality: safe childbirth requires more than facilities.* The Lancet Global Health, 2019. **7**(8): p. e990-e991.

benchmarking at national and subnational levels.[6] The transition model looks at key indicators among countries that have reached one of five phases of maternal, and neonatal and stillbirth mortality. Countries can compare their performance to those of others in the same phase and seek to understand what is needed to move to a phase with lower mortality. The country report's recommendations can be used to inform strategic discussions on where to prioritize investments in the health system for accelerated reduction of maternal and newborn mortality, including the balance of routine, basic and comprehensive Emergency Obstetric and Newborn Care (EmONC) services across primary to tertiary facilities to adequately provide respectful and life-saving care based on their maternal mortality, stillbirth, and neonatal mortality transition stage.[7] [8] It will also point to areas for future research to inform strategic planning for safe, effective, equitable, accessible and high-quality MNH service provision.

Study objectives

- To understand where women give birth, by what mode (vaginal, C-section), and who attends them (nationally, regionally, by socio-economic groups, and by facility sector/volume/level), using DHS/MICS and HMIS.
- To understand health outcomes* (neonatal mortality, stillbirths) by place, attendant, and mode of birth (nationally, sub-nationally, by socio-economic groups, and by facility sector/volume/level), using DHS/MICS & HMIS (*Maternal mortality data does not allow for disaggregated analyses).
- To analyze the intended and actual health policy and system characteristics in place for the provision of safe delivery care, using documents/data.
- To assess the extent to which countries with higher levels of safe, equitable and effective childbirth care also had favorable MNH-related policy and systems characteristics, and identify where related adjustments or additions in future plans and investments are needed to reach the next transition stage(s).

Data sources and indicators

Data sources

- Population-level household surveys: DHS or MICS for 2014
- Health Management Information System (HMIS): DHIS2 for 2022
- Health policy document review (WHO policy database 2018/19 and country updates)
- Health facility/HRH density in 2022 from CAM reports 2023

[6] Boerma T, Campbell OMR, Amouzou A, et al. Maternal mortality, stillbirths, and neonatal mortality: a transition model based on analyses of 151 countries. The Lancet Global Health 2023;**11**(7):e1024-e31 doi: https://doi.org/10.1016/S2214-109X(23)00195-X.
[7] Campbell OMR, Calvert C, Testa A, et al. The scale, scope, coverage, and capability of childbirth care. The Lancet 2016;**388**(10056):2193-208 doi: https://doi.org/10.1016/S0140-6736(16)31528-8.
[8] Boerma T, Campbell OMR, Amouzou A, et al. Maternal mortality, stillbirths, and neonatal mortality: a transition model based on analyses of 151 countries. The Lancet Global Health 2023;**11**(7):e1024-e31 doi: https://doi.org/10.1016/S2214-109X(23)00195-X.

- Health financing data on current health expenditure overall and for maternal conditions since 2013 (WHO Global Health Expenditure database)

Data were analyzed using Stata and Excel and are primarily presented graphically.

Indicators for DHS analysis

- **Assistant at birth** is defined as the proportion of women 15-49 years of age whose last birth was assisted by:
  1. Doctor
  2. Nurse or midwife
  3. Other skilled professional
  4. Other non-skilled (health provider or friend/relative)
  5. No assistance
- **Place of birth** is defined as the proportion of women 15-49 years of age who last birth was at:
  1. Hospital
  2. Lower-level health facility
  3. Home or other place
  - Note that births in private sector facilities may not be possible to stratify by level so private sector births are located as being in lower level facilities
- **Caesarean section** is defined as the proportion of live births that were delivered by caesarean section.

The reference population (denominator) for the above indicators was **women in reproductive age (15-49 years old) who had a birth in the last 2/3 years before the survey (last birth)**. MICS considers children under 2 and DHS under 3.

- **Neonatal mortality rate (NMR)** is defined as the number of deaths among children aged 0 to 30 days per 1000 live births. The reference period for NMR is 10 years before the survey.

All indicators were estimated for the whole country and stratified by the following characteristics (as available in each survey):

- Wealth quintiles, based on an asset index provided with the surveys, based on asset ownership and on household characteristics, divided in five groups (poorest, poorer, middle, wealthier, wealthiest).
- Area of residence (urban, rural).
- Assistant at birth (doctor, nurse/midwife, other skilled, other non-skilled, no assistance)
- Place of birth (hospital, lower-level facility, home birth) – for comparing Caesarean (C-) section rate and NMR.

Indicators for HMIS analysis

Essential indicators:

- Livebirths (OR all births) in facilities
- Caesarean section among livebirths (or among all births) in facilities

Optional indicators:

Mode of delivery: There are two main modes of childbirth, vaginal birth and caesarean birth. Note that these can be recorded for all births (live and still) or only for live births. If it is unclear and you are unable to find out what was recorded, look at the number of recorded stillbirths. If these are low, it is best to assume that C-sections etc. were only reported for *live births* and use this term in the results.

- Vaginal births: Further divided into spontaneous (non-instrumental) + assisted (instrumental) vaginal births;
    - Spontaneous (non-instrumental) vaginal birth, which sometimes involves manual maneuvers or episiotomy.
    - Assisted (instrumental) vaginal live births, involving forceps live births + vacuum or ventouse.
- Caesarean (C-) section births:
    - Pre-labour caesarean + caesarean after labour starts = C-sections among all live births

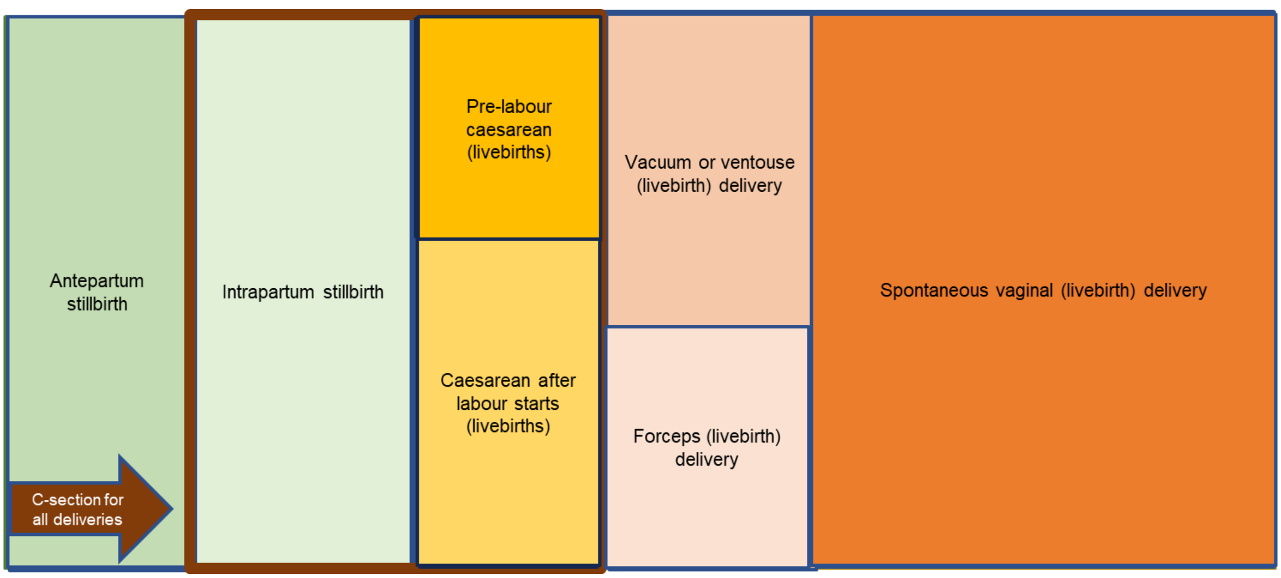
<u>Birth outcomes:</u> Births can be live or still

- Stillbirths (fresh and/or macerated):
    - Macerated stillbirths + fresh stillbirths = all stillbirths
    - Antepartum stillbirths + intrapartum stillbirths = all stillbirths
        - Macerated ≠ Antepartum, but similar.
        - Fresh ≠ Intrapartum, but similar

<u>Checks:</u>

- C-section deliveries for intrapartum stillbirths + C-sections for live births (pre-labour caesarean + caesarean after labour starts) = C-sections among all deliveries
- Assisted vaginal live births + spontaneous (normal) vaginal live births = all vaginal live births
- Stillbirths + live births = all births

Figure 1a: MNH indicator definitions



Data management and quality

DHS and MICS

- o Before the analyses, original categories for place of delivery and professional assistance during labor were listed and organized into Excel spreadsheets. In each spreadsheet, all MICS and DHS surveys available for each country were added to ask country teams to recategorize into the new categories.
    - Place of delivery: home, lower-level facility, or hospital
    - Professional: doctor, nurse or midwife, other skilled professional, other non-skilled, which can be a health provider or a friend/relative, or no assistance
- o After country's recategorization, the new place of delivery variable was compared to the standardized institutional delivery indicator from the international Center for Equity in Health (ICEH) mega database. Consistency was evaluated by adding the lower-level and hospital categories and comparing it to the institutional delivery coverage. Differences larger than 2 pp were individually assessed.
- o A similar process was conducted for assistance at birth, for which the doctor, nurse, and other skilled categories were combined and compared to the standardized skilled birth attendance (SBA) indicator from the ICEH mega database.
- o For countries with at least 3 surveys available, trend analyses were performed to check consistency of estimates throughout time. Any peaks or valleys that were incompatible with what was expected were individually evaluated.
- o The prevalence for the c-section indicator was compared to the place of delivery and a face validity check was performed in which the prevalence should be zero (or very close to zero) in home births and the highest prevalence in hospital deliveries.
- o Additionally, face validity checks were also performed for place of delivery and assistance at birth according to wealth quintiles and area of residence. It was expected that a higher share of hospital deliveries would happen in wealthier quintiles and in urban areas. Similarly, a higher share of births assisted by doctors would also happen in these extracts.

DHIS2/HMIS

- We first extracted the data using API wrapper, then transformed it to correct format for analysis
- In preparing the HMIS/DHIS2 data, the first step was to merge the Administrative and MNH facility records in order to have information on the district, level, and ownership of the health facilities, which comes from the administrative records joined to the MNH facility records.
- There were 10290 facilities on the administrative list and 4,345 facilities that reported MNH indicators (MNH facilities).
- There were 17 facilities on the administrative list that did not report any deliveries.
- There were 4265 those reporting births or deliveries that matched with the administrative data.

Table 1a: Summary of the health facility data quality assessment for 2018-2022 (Stata code #1a output)

	Metric		2022
1	Indicators vs Reporting datasets	# facilities merged	4275
		# facilities from Indicators not merging with Reporting data	15
		# facilities from Reporting not merging with Indicators data	4321

2		# facilities merged	4265
		# facilities from Admin not merging with indicators data	6025
		# facilities from indicator not merging with Admin data	22
3	Facilities with 0 births per year	# of facilities with 0 births per year	17

The assessment of health facility data quality used the monthly facility reports and focused on 1) report completeness, 2) extreme outliers and missingness and 3) internal data consistency. Data quality adjustments for reporting completeness (yearly) and extreme outliers (monthly) were done before further analyses on annual data. The percentage of facilities with no missing monthly values for stillbirth in the year is relatively low because is likely health information officers at the facility leave the entry space blank in the month where no stillbirth was recorded. This will appear as missing when in actual fact there was no stillbirth recorded for index facility. In addition, some lower-level health facilities are not supposed to do deliveries and are likely going to leave that column blank. The percentage of facilities with no missing monthly values in the year for stillbirth is very low and will affect the overall mean percentage of the individual percentage.

Table b: Summary of the health facility data quality assessment for 2022

	Metric		**2022**
1	Completeness of monthly facility reporting for deliveries	a) % of expected monthly facility reports (national)	81.00
		b) % of facilities with 12 data points	62.34
2	Percentage of facilities with no missing monthly values in the year (*facilities which reported at least one delivery in the year)*	a) Total births	99.14
		b) Livebirths	99.12
		c) Stillbirths	7.25
		d) Caesarean section*	100.00
		d) Mean percentage of the individual percentages	76.38
3	Percentage of facilities with no inconsistencies between stillbirths, live births and total births (*Births=Stillbirths + Livebirths (monthly))*	% with no inconsistency at 2- standard deviations cut-off (monthly)	100 .00
4	Percentage of facilities with no inconsistencies between livebirths, CS, vaginal births and AVD *(Livebirths= CS+ vaginal births+AVD) (monthly)*	% with no inconsistency at 2- standard deviations cut-off (monthly)	100.00
5	Percentage of facilities with no inconsistencies between stillbirths, FSB and MSB (Stillbirths = FSB + MSB) (monthly)	% with no inconsistency at 2- standard deviations cut-off (monthly)	100.00
6	Extreme outliers over time	a) % of monthly values that are not extreme outliers	98.42
		b) % of facilities with no monthly extreme outliers in the year	92.24
7	**Overall data quality score (mean)**		84.00

*Includes all facilities, not possible to isolate those meant to perform CS in the check so excluded from overall score.

Table 1c: Summary of adjustments made to the raw health facility data in preparation of a clean data set for the endline analysis

Problem	Action	Adjustment
Incomplete reporting by facility, variable over time, affecting trend assessment	If a facility did not have all the 12 reports for the year, an assumption was made about the volume of services provided for the missing data points	Adjustment was made by multiplying the yearly volume by the reciprocal of the reporting rate
Extreme outliers can greatly affect coverage trend assessments	If a monthly value was greater or smaller than 5 times the median absolute deviation (MAD) from monthly median value, an adjustment was made	Extreme monthly outliers are corrected and given the median value for the same year
Missing values	If there is a missing value, data were imputed	Median monthly value for the year was imputed for the month with missing value

The correction of extreme monthly outliers by replacing them with the median value for the same year will lead to an unbiased estimation of the coverage indicator of interest. Imputing missing values retains most of the information in the dataset and will lead to an unbiased estimation of the indicator of interest. In Ghana, the missing reports are mostly standard among private health facilities and teaching hospitals. It was observed that private health facilities and teaching hospitals, on average, provide 30% of delivery services. The k-factor was then set to 0.3 for MNH services.

Health outcomes by delivery place and attendant

Trends in national maternal mortality ratio (MMR)

Figure 2 shows the trends in maternal mortality rates (MMR) in Ghana between 2000 and 2020. MMR decreased from 500 deaths per 100,000 live births in 2000 to 310 deaths per 100,000 live births in 2020. Thus, MMR has reduced by approximately 38 percentage point between 2000 and 2020.

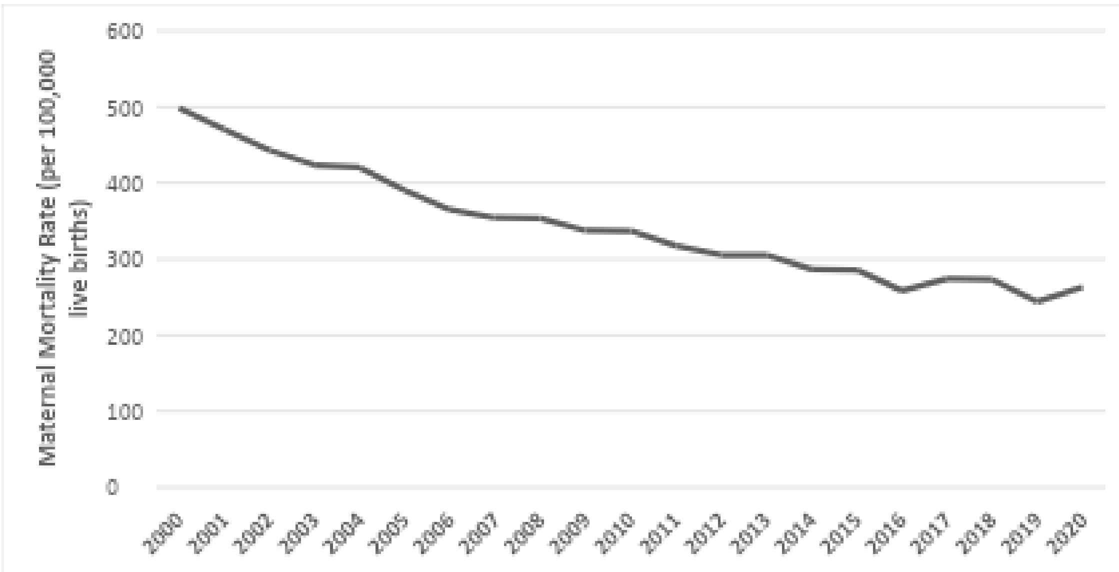


Figure 2: Trends in national maternal mortality ratio in Ghana
Source: Demographic and Health Surveys

Trends in national neonatal mortality rate (NMR)

Figure 3 shows the trends in neonatal mortality rate (NMR) in Ghana between 2000 and 2021. NMR decreased from 36 deaths per 1000 live births in 2000 to 23 deaths per 1000 live births in 2021. Thus, NMR has reduced by approximately 36 percentage points between 2000 and 2021.

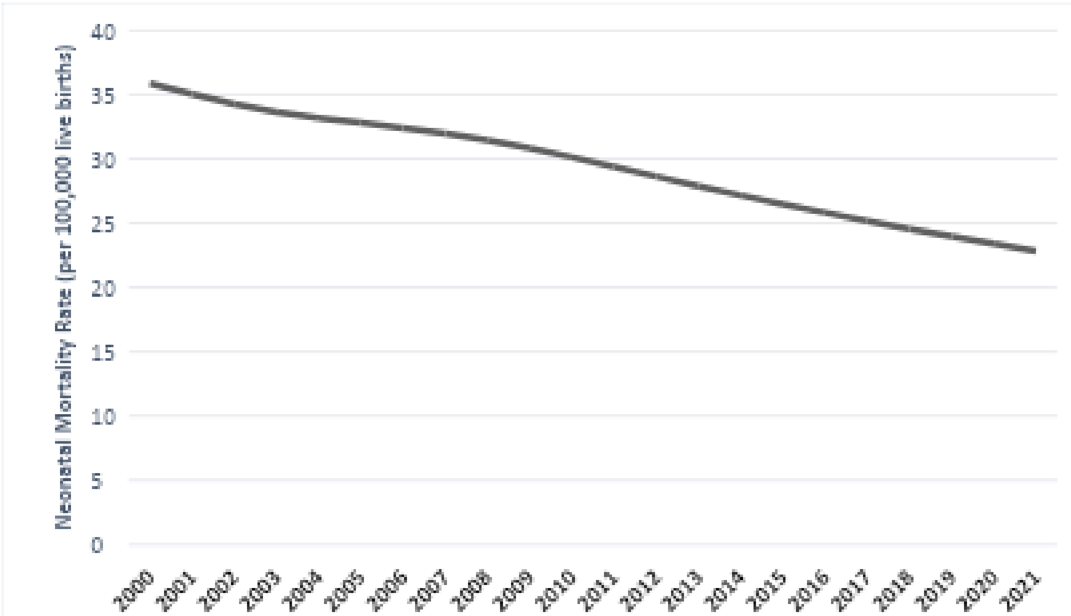
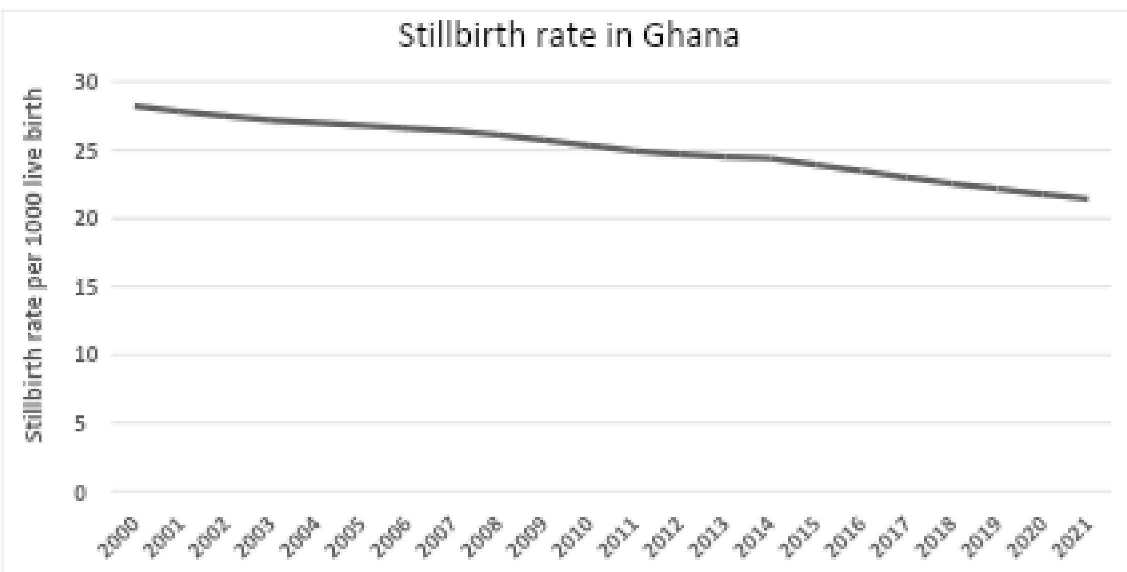


Figure 3: Trends in neonatal mortality rate in Ghana
Source: Demographic and Health Surveys

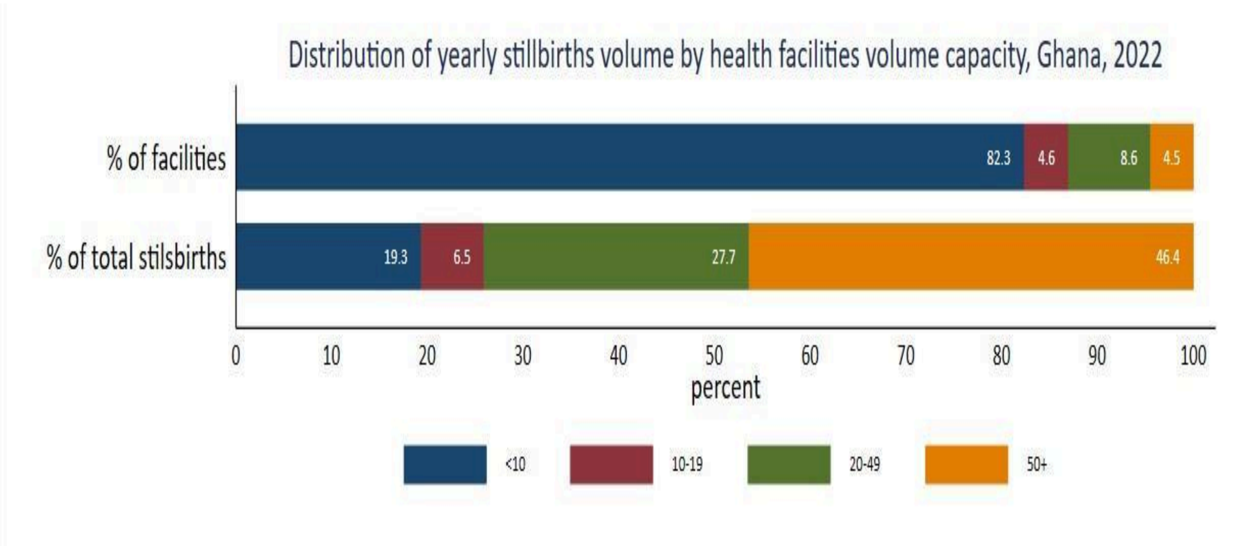
Trends in national stillbirths

The stillbirth rate in Ghana has marginally declined from 28 per 1000 live birth in 2000 to 21 per 1000 live birth in 2021.



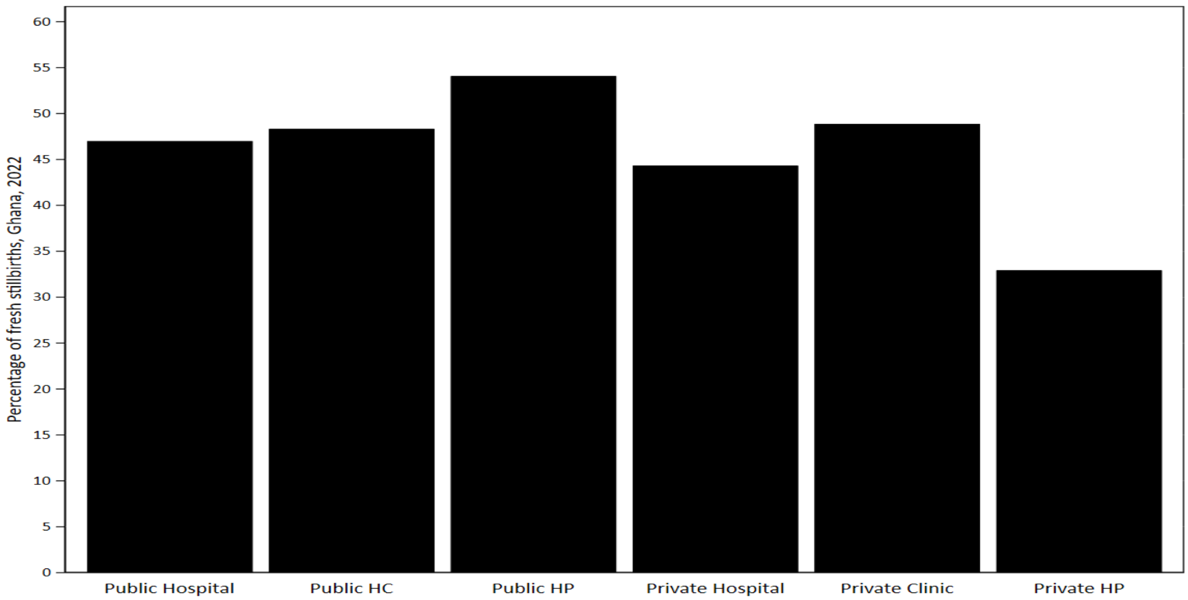
Stillbirth volumes nationally in the most recent year (HMIS 2022)

About 82% of all health facilities contribute to less than 10% of total stillbirths. Approximately 5% of health facilities recorded about 46% of all stillbirths in Ghana, and this may be attributed to the fact that lower-level health facilities are not allowed to do deliveries even though they constitute more than 50% of the total number of health facilities in the country.

- 

Stillbirth volumes by facility level, type, and ownership in HMIS 2022

In 2022, most stillbirths were recorded in Public HP with private HP recording the lowest percentage of stillbirths.



National policy and health system context for MNH

This section covers the national policy and health systems context for MNH care in the areas of 1) health governance, 2) organization and resources for MNH (facilities, human resources, and supplies); 2) service delivery processes (to improve quality of skilled and respectful care); 3) financing; and 4) information systems. These areas of focus align with previous global evidence and conceptual frameworks for MNH.[9,10,11,12,13] The data in this section is taken from the WHO 2018/19 SRMNCAH policy survey (https://platform.who.int/data/maternal-newborn-child-adolescent-ageing/national-policies), and can be updated with additional information you know about policies that have come into place since 2018/19.

Health policy context for MNH

The Government of Ghana, through the Ministry of Health and its implementing agencies, has implemented policies, laws, guidelines, and interventions with the primary goal of improving maternal and neonatal health outcomes in Ghana. Table 2 summarizes the different policies, programs, laws and legislations that have been implemented over the period.

[9] World Health Organization (WHO). Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies. Geneva, Switzerland: WHO;2010.
[10] Koblinsky M, Moyer CA, Calvert C, et al. Quality maternity care for every woman, everywhere: a call to action. The Lancet 2016;**388**(10057):2307-20 doi: 10.1016/S0140-6736(16)31333-2.
[11] Chou D, Daelmans B, Jolivet RR, Kinney M, Say L. Ending preventable maternal and newborn mortality and stillbirths. BMJ : British Medical Journal 2015;**351**:h4255 doi: 10.1136/bmj.h4255.
[12] Singh NS, Blanchard AK, Blencowe H, et al. Zooming in and out: a holistic framework for research on maternal, late foetal and newborn survival and health. Health Policy and Planning 2021 doi: 10.1093/heapol/czab148.
[13] Raven JH, Tolhurst RJ, Tang S, van den Broek N. What is quality in maternal and neonatal health care? Midwifery 2012;**28**(5):e676-e83 doi: https://doi.org/10.1016/j.midw.2011.09.003.

Table 2: National policies, guidelines, plans or strategies for MNH care in Ghana

Topic	Yes or No? – WHO survey 2018/19	If yes, what is the name and years (and any related documents)?	If no, anything new in place since 2018/19 (name, year, documents / URL)?	Add a comment on the strength or intensity of implement ation of this policy/ law/ guideline
Governance: How are services meant to be governed to provide childbirth care for all women and newborns?				
1. Is there a national coordinating body that looks at RMNCAH or its components? (indicator)	Yes	Family Health Division (FHD), Ghana Health Service, May 2008		High intensity
2. Is there a national law or provision to guarantee universal access to primary health care to all?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity
3. Are there national policies/guidelines on childbirth?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity
4. Does the country have a national policy/guideline on the right of every woman to have access to skilled care at childbirth?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity
5. Is there any policy or legislation on abortion care in cases to protect the health or life of the woman? [14]	Yes	The Provisional National Defence Council Law (PNDCL) 102 of 1985 which amended Act 29, Section 58 of the Criminal Code of 1960 makes abortion legally permissible if the pregnancy is the result of rape or incest, or if the pregnancy is a threat to the health of the mother or the foetus		High intensity
6. Is there a national guideline on post-abortion care?[15]	Yes	The Provisional National Defence Council Law (PNDCL) 102 of 1985 which amended Act 29, Section 58 of the Criminal Code of 1960 makes abortion legally permissible if the pregnancy is the result of rape or incest, or if the pregnancy is a threat to the health of the mother or the foetus		Moderate intensity
Organization and resources: How are services organized and resourced (with facilities, health workers, and supplies) to provide childbirth care for all women and newborns?				
Health facilities				
7. If in place, does the national policy/guideline indicate designated health facilities as the preferred place of childbirths?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity
8. Are there national policies/guidelines on postnatal care for mothers and newborns?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity

[14] Any document to specify if any legal grounds for abortion to preserve the health or life of a pregnant woman [https://bmcinthealthhumrights.biomedcentral.com/articles/10.1186/s12914-018-0183-1]. Data from Data from WHO Global Abortion Policies database: https://abortion-policies.srhr.org/

[15] Data from WHO Global Abortion Policies database: https://abortion-policies.srhr.org/

9. Does the national policy recommend length of stay under observation of skilled attendant for mother and the baby after normal childbirth at facility? If yes, how long?	Yes, 12-24 hours	Free Maternal Health Care Policy (FMHCP)		High intensity
10. Is there any guideline in place for ensuring transport and/or emergency referrals specifically for childbirth?	Yes	Referral Policy and guidelines, May 2012		Moderate intensity
Health workers				
11. Are there national policies/guidelines that set forth a competency framework for maternal and/or newborn health care?	Yes	Ghana MDG Acceleration Framework (MAF), 2016/17 Strategy and Operational Plan		High intensity
12. Is there a continuous professional education system in place for primary health care clinicians and/or nurses to receive maternal and newborn health specific training?	Yes	CHPS operational policy 2015		High intensity
Supplies, drugs and commodities				
13. Are there national policies/guidelines on essential medicines and equipment?	Yes	National Health Insurance and Ministry of Health Essential Medicine List, 2017		High intensity
14. If present, does the national childbirth policy/guidelines recommend the use of any of the following specific drugs (oxytocin or misoprostol) for the prevention and treatment of postpartum hemorrhage?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity
15. Does the country have a national policy/guideline on the availability of essential equipment in facilities where births take place?	Yes	Ghana's "National Health Policy: Achieving Universal Health Coverage (UHC) (2019-2030)" and "The UHC Roadmap (2020 – 2030)"		High intensity
16. Are self-inflating bag (newborn size) with neonatal and paediatric masks of different size and valve included in the national list of commodities indicated for use of pregnancy, childbirth and postpartum care?	Yes	Health Commodity Supply Chain Master Plan (2021-2025)		High intensity
17. Are blood and blood products included in the national list of commodities indicated for use of pregnancy, childbirth and postpartum care?	Yes	Health Commodity Supply Chain Master Plan (2021-2025)		High intensity
Service delivery: What supports are meant to improve the quality of childbirth care (technical competence and experiences of care)?				
18. Is there a national policy/guideline to improve quality of care (QoC) for health facilities?	Yes	The Health Institutions and Facilities Act, 2011 (Act 829) established the Health Facilities Regulatory Agency (HeFRA) in PART ONE of the Act. HeFRA was set up to license facilities for the provision of quality public and private healthcare service		High intensity
19. Does the national policy/guideline to improve quality of care address maternal health?	Yes	The Health Institutions and Facilities Act, 2011 (Act 829) established the Health Facilities Regulatory Agency (HeFRA) in PART ONE of the Act. HeFRA was set up to license facilities for the provision of quality public and private health care service		High intensity
20. Does the national policy/guideline to improve quality of care address newborn health?	Yes	The Health Institutions and Facilities Act, 2011 (Act 829) established the Health Facilities Regulatory Agency (HeFRA) in PART ONE of the Act. HeFRA was set up to license facilities for the provision of quality public and private health care service		High intensity
21. Are there mechanisms in place at the facility level to solicit feedback on quality and access from community members (e.g users, family?)	Yes	The Health Institutions and Facilities Act, 2011 (Act 829) established the Health Facilities Regulatory Agency		High intensity

		(HeFRA) in PART ONE of the Act. HeFRA was set up to license facilities for the provision of quality public and private health care service		
22. If present, does the national childbirth policy/guidelines recommend presence of a companion of choice during labour and birth?	Yes	Family Health Division (FHD), Ghana Health Service, May 2008		High intensity
23. If present, does the national childbirth policy/guidelines recommend for the woman to choose the birthing position?	Yes	Family Health Division (FHD), Ghana Health Service, May 2008		High intensity
24. Does the country have a national policy/guideline on the availability of clean water and sanitation in the facilities where the births take place?	Yes	The Health Institutions and Facilities Act, 2011 (Act 829) established the Health Facilities Regulatory Agency (HeFRA) in PART ONE of the Act. HeFRA was set up to license facilities for the provision of quality public and private health care service		High intensity
Financing: how are childbirth care for mothers and newborns meant to be financed?				
25. Is there a national policy/legislation on free access to health services in the public sector at the point of use for newborns (0-4 weeks)?	Yes	Free Maternal Health Care Policy (FMHCP)		High intensity
26. Are the following health services provided free of charge at point of use in the public sector for women of reproductive age: Caesarean section?	Yes, for all women	Free Maternal Health Care Policy (FMHCP)		High intensity
27. Are the following health services provided free of charge at point of use in the public sector for women of reproductive age: Management of other birth complications?	Yes, for all women	Free Maternal Health Care Policy (FMHCP)		High intensity
28. Are the following health services provided free of charge at point of use in the public sector for newborns: Management of birth complications (asphyxia, prematurity, sepsis, congenital anomalies)?	Yes, for all newborns	Free Maternal Health Care Policy (FMHCP)		High intensity
Information: What data are meant to inform action, accountability, or advocacy on childbirth care for mothers and newborns?				
29. Is there a national policy/ law that requires every birth to be registered?	No			L
30. Is there a national policy/ law that requires every death to be registered?	Yes	Registration of births and deaths act, 2020 (act 1027)		High intensity
31. Is there a national policy/guideline/law requiring all maternal deaths to be reviewed?	Yes	Family Health Division (FHD), Ghana Health Service, May 2008		High intensity
32. Is there a national policy/guideline/law requiring all stillbirths (fresh or macerated) to be reviewed?	Yes	Family Health Division (FHD), Ghana Health Service, May 2008; Ghana National Newborn Health Strategy and Action Plan 2014–2018		High intensity
33. Is there a national policy/guideline/law requiring all neonatal deaths (0-28 days) to be reviewed?	Yes	Ghana National Newborn Health Strategy and Action Plan 2014–2018		High intensity
34. Have any SARAs or SPAs been conducted in the country, and in what year?	Yes, SPA	Ghana Harmonized Health Facility Assessment 2022-2023		High intensity

Table 3: Structural organization of childbirth health services and referral pathways

HMIS category *(change or remove levels as needed)*	Number of facilities in the Administrative database	Number (and % of total) facilities providing MNH services	Name of facility type	DHS category (hospital or lower level facility)	To which other levels should they make emergency referrals for complicated cases, if any?
Public sector					
Level 1	7095	2064 (47.50)	CHPS	Lower level	Hospital
Level 2	1068	986 (22.69)	Health Centers	Lower level	Hospital
Level 3	376	212(4.88)	Maternity Homes	Lower level	Hospital
Level 4	1256	440 (10.13)	Clinics	Lower level	Hospital
Level 5	72	62 (1.43)	Polyclinics	Lower level	Hospital
Level 6	16	574 (13.21)	Hospitals	Hospital	Teaching Hospital
Level 7	7	7 (0.16)	Teaching hospitals	Teaching Hospital	Teaching Hospital

Source: District Health Information Management System

Table 3: Health resources – facilities and health workers for each type of childbirth care

Type of MNH care	Facilities: what facilities are meant to provide each type of care?	Health workers: what cadres are meant to be trained to attend each type of care?[16]
Public sector		
Routine (uncomplicated) childbirth care [17]	Community-based Health Planning Services, Maternity Homes, Health Centers, Clinics, Polyclinics, Hospitals	Nurses, Midwives, Medical Doctors,
Basic EmONC [18]	Community-based Health Planning Services, Maternity Homes, Health Centers, Clinics, Polyclinics, Hospitals	Nurses, Midwives, Medical Doctors,
Comprehensive EmONC (i.e. C-sections) [19]	Hospitals	Medical Doctors, Gynecologists, Obstetricians

[16] Filled partially using WHO 2018/19 SRMNCAH survey responses for the country- edit as needed.

[17] Routine care refers to safe uncomplicated childbirth care, including: water supply, continuous electricity, soap, latex gloves, 24 hour services or not, routine partograph use and infection prevention

[18] BEmONC signal functions include: parenteral antibiotics, parenteral oxytocin, parenteral anticonvulsants, manual removal of placenta, removal of retained products of conception, assisted vaginal delivery, and neonatal resuscitation (bag and mask, oxygen)

[19] CEmONC signal functions includes BEmONC plus: Caesarean section and blood transfusion

Specialized care for small/ sick newborns [20]	Hospitals	Medical Doctors

Source: 2022 Ghana Harmonized Health Facility Assessment Report

Health system inputs relevant to MNH care

According to data from the District Health Information Management System (DHIMS2), as of August 2022, there were a total of 9,505 health facilities in Ghana, including 7,745 public health facilities, 1,360 private self-financing and 295 quasi-governmental facilities (Table 1). Most facilities are CHPS, health centers, clinics, and maternity homes (Table 4a). Most health facilities are in the Greater Accra and the Ashanti regions. They are the regions that are heavily populated. Northeast region has the smallest number of health facilities.

Table 4a: Ghana - health facility distribution by ownership as of 31st August 2022

Region	Other Faith-Based	Quasi-Government	Government	Private	CHAG	Mines
Central	1	9	554	93	17	
Oti			238	11	6	
Upper West	2	1	447	13	16	
Western	1	13	483	103	15	7
Ahafo	1		170	11	6	1
Ashanti	5	7	1320	299	77	1
Volta		1	478	47	19	
Upper East		1	528	39	20	
Western North	1	1	281	46	18	3
North East			117	7	8	
Eastern		3	1048	103	23	
Bono East	1		329	30	8	
Savannah			175	8	11	
Greater Accra	1	36	793	457	12	
Northern		5	417	42	14	
Bono		6	367	51	25	
Ghana	**13**	**83**	**7745**	**1360**	**295**	**12**

[20] Care for small/sick newborns may include: Oxygen/CPAP, intravenous fluids, antibiotics, phototherapy and/or exchange transfusion

Source: 2022 Ghana Harmonized Health Facility Assessment Report

There are approximately 44 nurses to a physician in Ghana and the total number of healthcare workers per 10000 population is 84117. The Ghana health systems performance based on health workforce showed significant improvement compared to global standards of 2 facilities per 10,000 population, 18 beds per 10,000 population, 23 (or 44) health workers per 10,000 population (Table 4b)

Table 4b: Health system input indicators for health resources (2022)

	Total pop	Facilities per 10000	Hospitals per 10000	Health centers per 10000	For-profit to all facilities (%)	Beds per 10000	Total health workers per 10,000	Nurse: physician ratio
National	**31458882**	**10638**	**551**	**1062**	**2382**	**30181**	**84117**	**43.51**
Ahafo	576527	200	9	22	33	713	2753	118.70
Ashanti	5554034	1759	174	166	440	5461	11994	50.26
Bono	1234032	478	18	66	98	1700	4360	25.42
Bono East	1228673	410	13	40	55	1286	3460	181.11
Central	2919880	864	30	79	199	3077	6767	56.84
Eastern	2987094	1201	39	138	149	3538	9216	39.78
Greater Accra	5570263	1710	114	51	792	3643	10763	15.06
North East	672785	136	4	22	12	542	1593	198.13
Northern	2359470	552	33	60	102	1841	5442	174.55
Oti	734110	238	7	33	17	539	2328	109.86
Savannah	666985	243	4	30	25	499	1879	207.78
Upper East	1328550	667	16	77	69	1139	5323	105.46
Upper West	920431	567	11	72	45	1340	4269	45.91
Volta	1699596	576	29	124	91	1856	4916	63.68
Western	2107030	673	35	55	181	1990	6079	45.76
Western North	899422	364	15	27	74	1017	2975	147.75

Source: Country Annual Meetings data 2023 (Excel: Health System Data CAM for 2022)

*Total health workers includes physicians + nurses + non-clinical physicians

Healthcare Financing

Ghana healthcare spending for 2020 was $85, a 15.58% increase from 2019 which was approximately $74, a 0.81% decline from 2018**.**

Table 5: Health system input indicators for financing

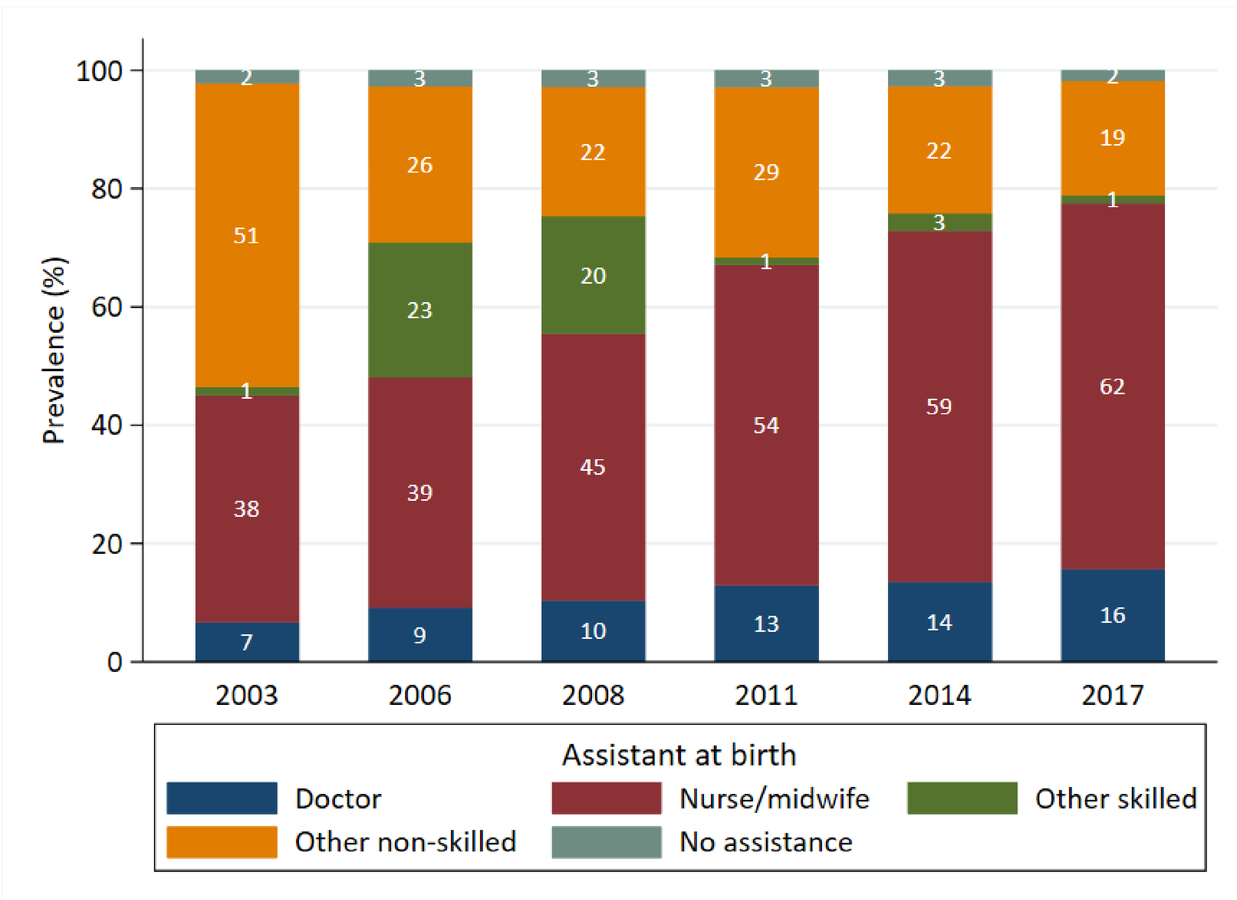
Indicator	2013	2014	2015	2016	2017	2018	2019	2020	Average across years
Current Health Expenditure (CHE) per capita in constant 2020 US$	104.8	78	77.7	64.4	65.6	74.1	73.5	85	77.9
Health Expenditure on Maternal Conditions as % of Current Health Expenditure (all sources)		5	3.8	4.1	4.1	4.1			4.2

Domestic General Government Health Expenditure on Maternal Conditions as % of Current Health Expenditure		1.6	1.5	1.6	1.4	1.6			1.5
Domestic Private Expenditure on Maternal Conditions as % of Current Health Expenditure		3.2	2.4	2.5	2.7	2.5			2.7

Source: Global Health Expenditure database of National Health Accounts (https://apps.who.int/nha/database/ViewData/Indicators/en)

Understanding population trends in where women give birth and who is attending them (DHS)

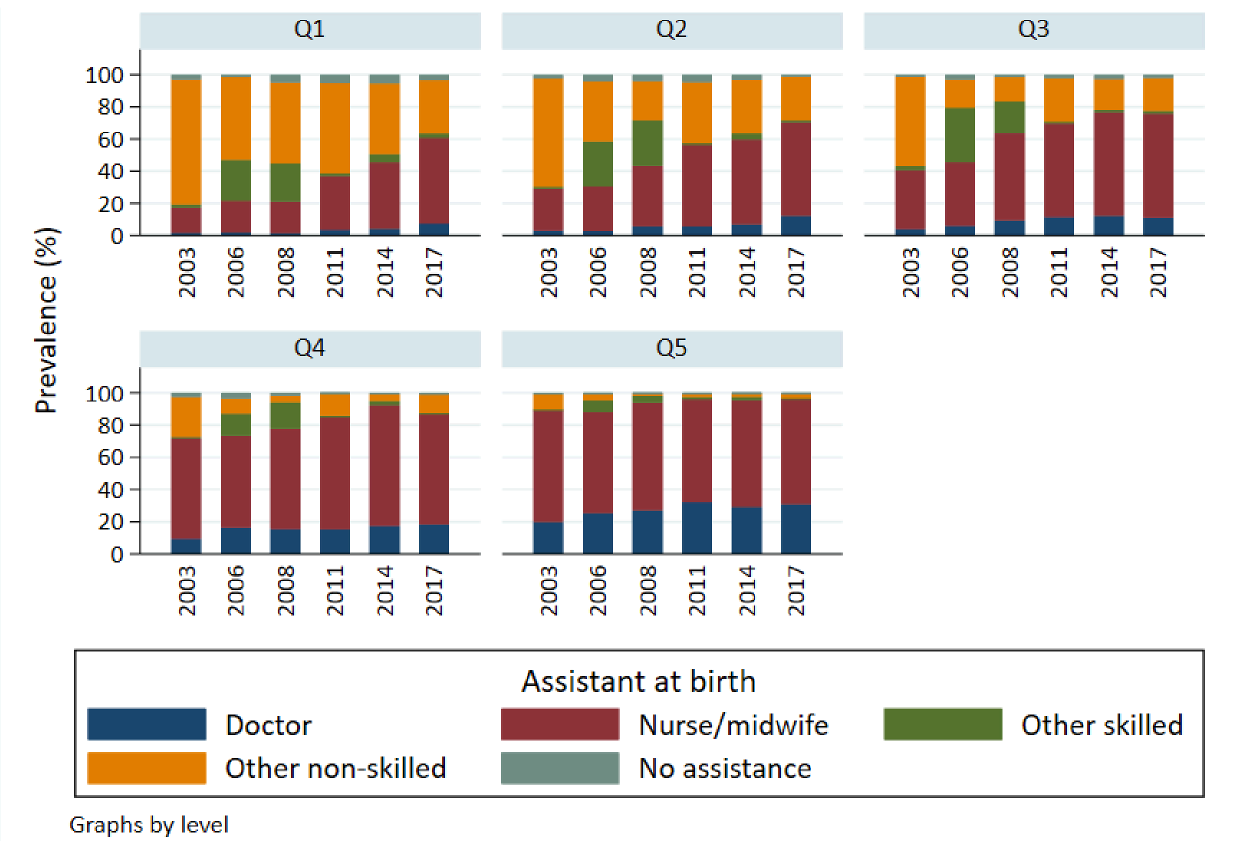
The proportion of skilled delivery has increased significantly over time (2003 to 2017). Non-facility-based deliveries have also shown a significant decline within the period.



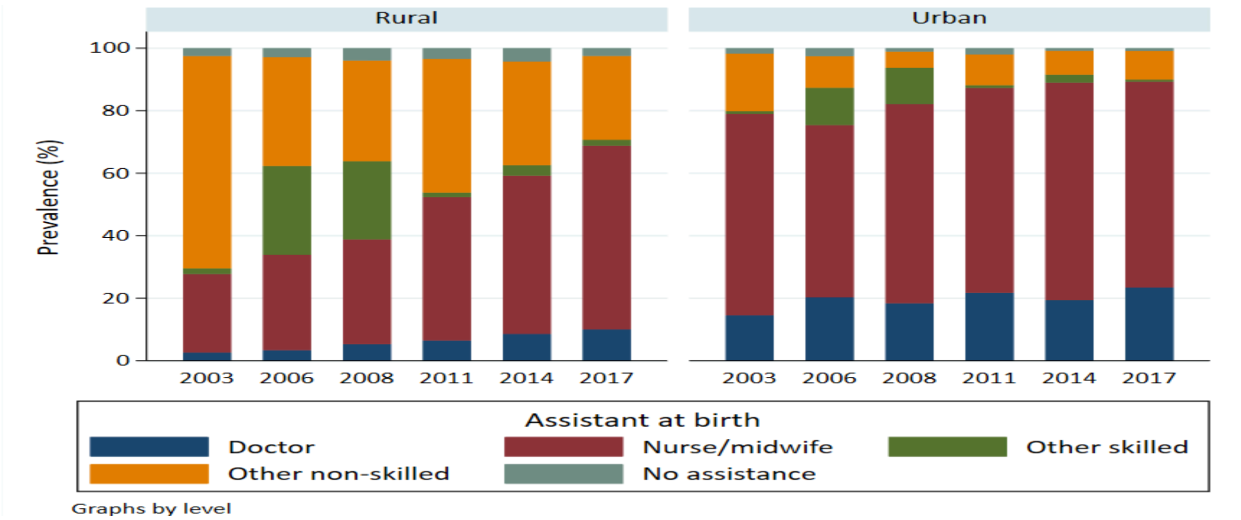
Institutional deliveries by subnational region, wealth, and residence groups

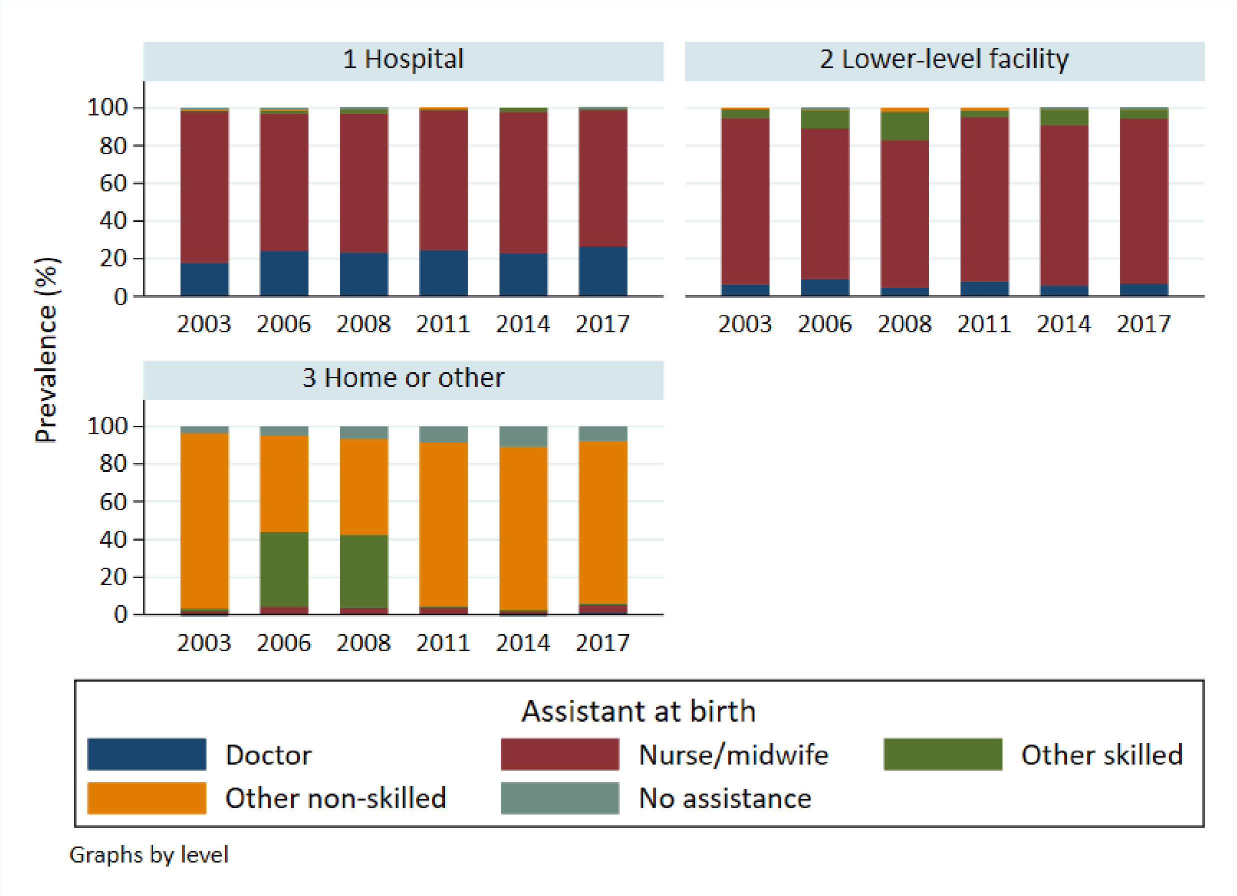
Non-skilled deliveries are higher among women in the northern, Upper East, Upper West and Volta regions compared to other regions. Most skilled delivery occurred in the Greater Accra Region. Skilled delivery has increased significantly in all the regions from 2003 to 2017.

Women in the richest quintile (Q5) had more skilled delivery compared to women in the poorest quintile but the disparities has reduced over time.



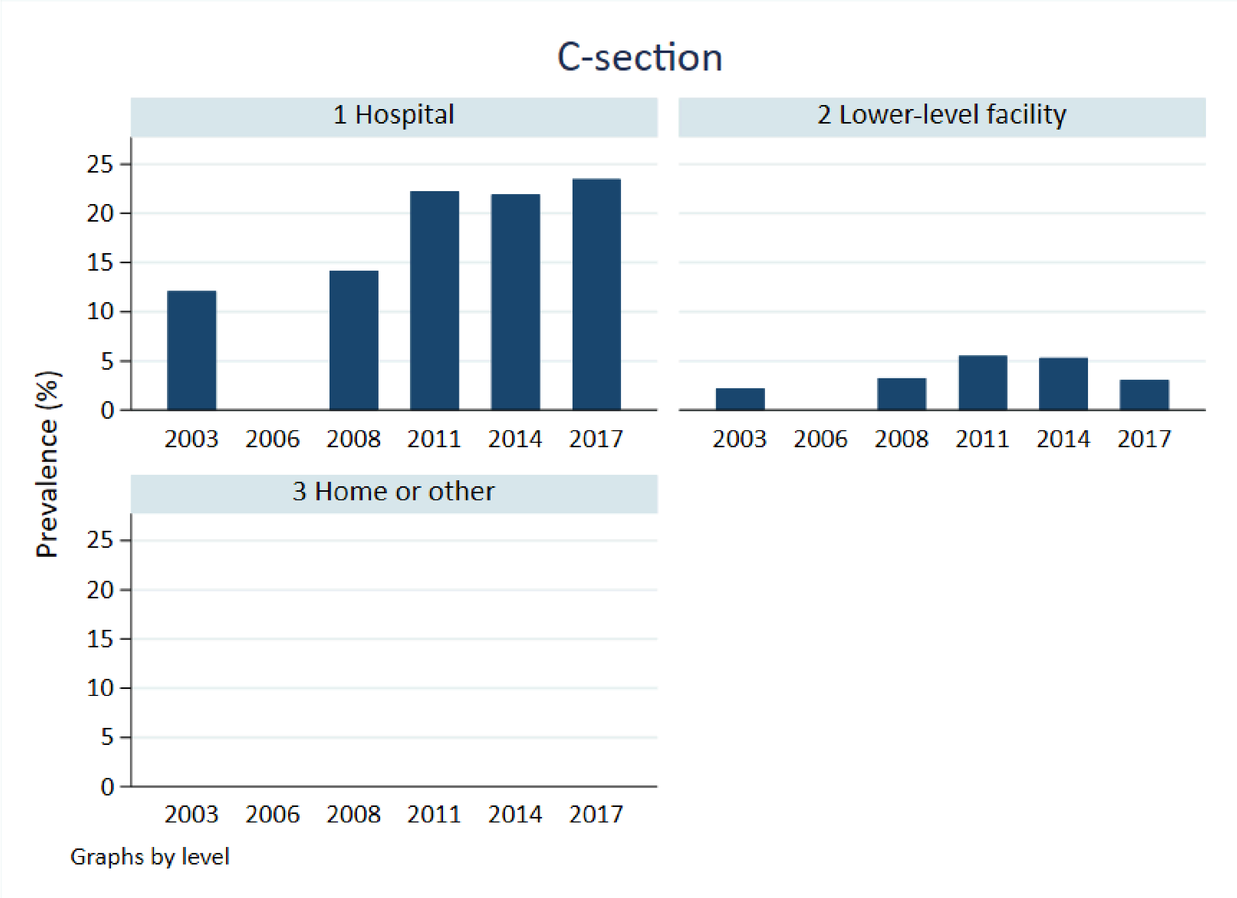
Most deliveries in both rural and urban areas are conducted by nurses and midwives and deliveries by medical doctors are higher in urban areas compared to rural areas. Even though deliveries by medical doctors appear to be increasing over the period, the rate of increase significantly remains lower in rural areas compared to urban areas.





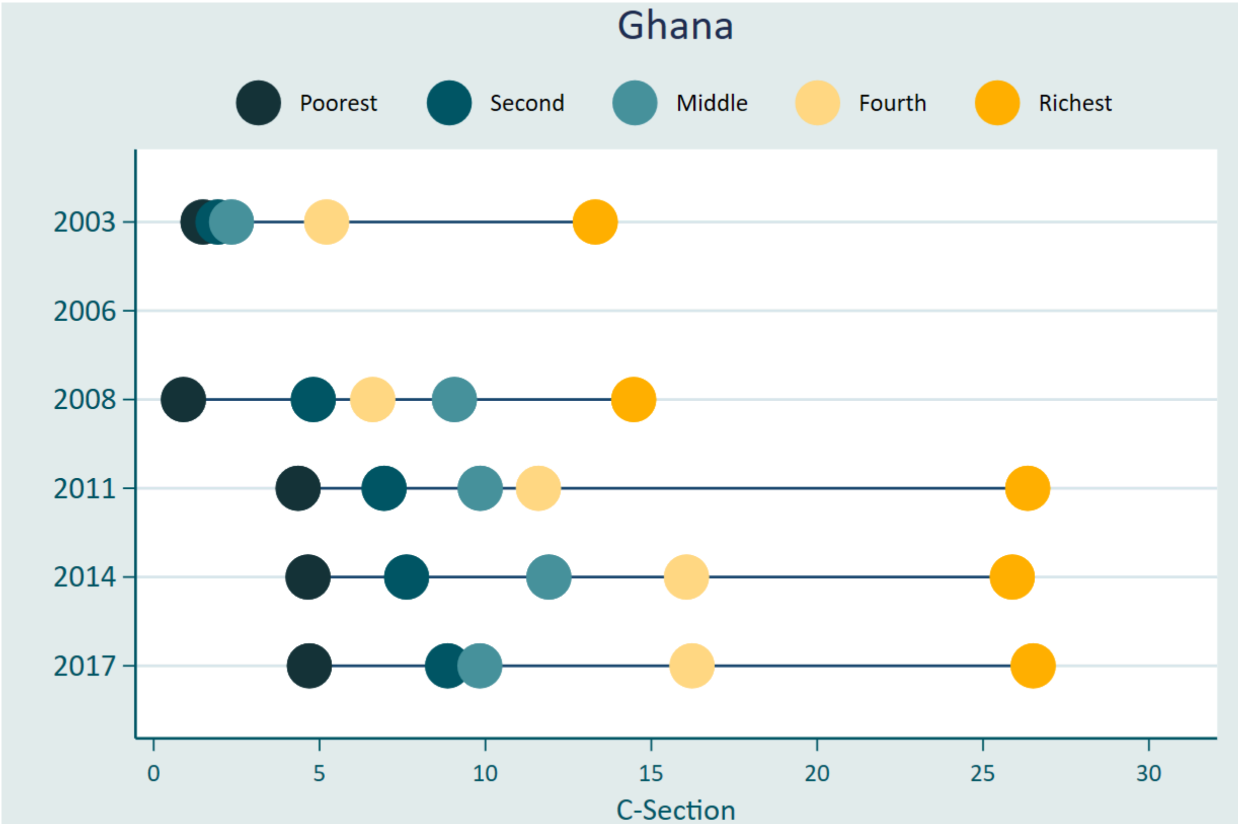
Trends in C-section rates nationally by facility level/type:

Cesarian Sections are conducted in teaching hospitals and regional and district hospitals in Ghana. CS in hospitals have increased between 2003 to 2017 from approximately 12% to 23%.



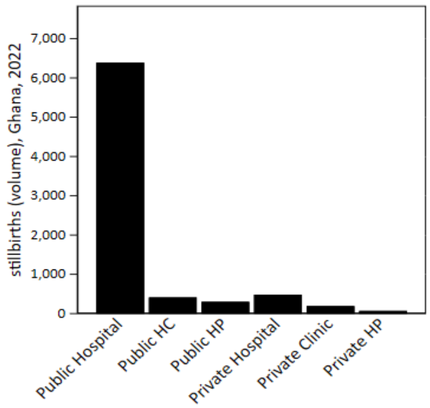
C-section rates (per 100 births) by wealth quintile equiplot

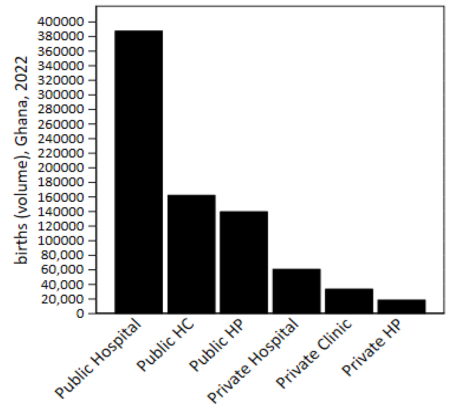
The disparities in cesarean section rates have increased between 2003 and 2017 as the gap between the rich and poor relative to CS rate keeps widening over the period. The rich are more likely to have CS at delivery compared to the poor and this has not changed over the period. The women from the richest households have C-section rates higher than 20%. However, women from the poorest households have a CS rate of approximately 5%.

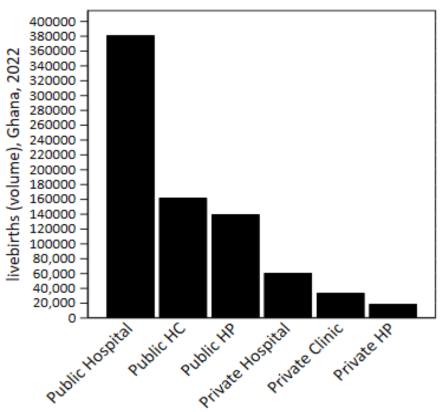


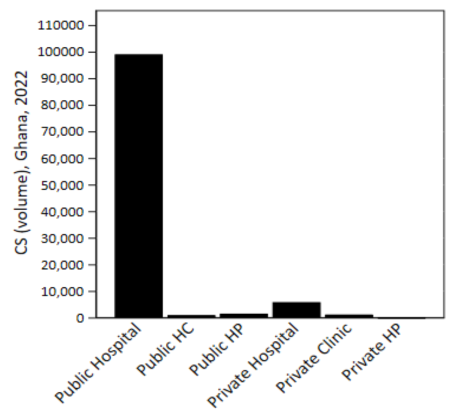
Understanding sizes and volumes of facilities where women give birth (HMIS)

The histogram below shows the distribution of facilities offering delivery services by type and ownership. Total births which includes livebirths, stillbirths and cesarean sections were higher in public health facilities and lower in private clinics and HP as expected since these facilities usually do not conduct delivery services.



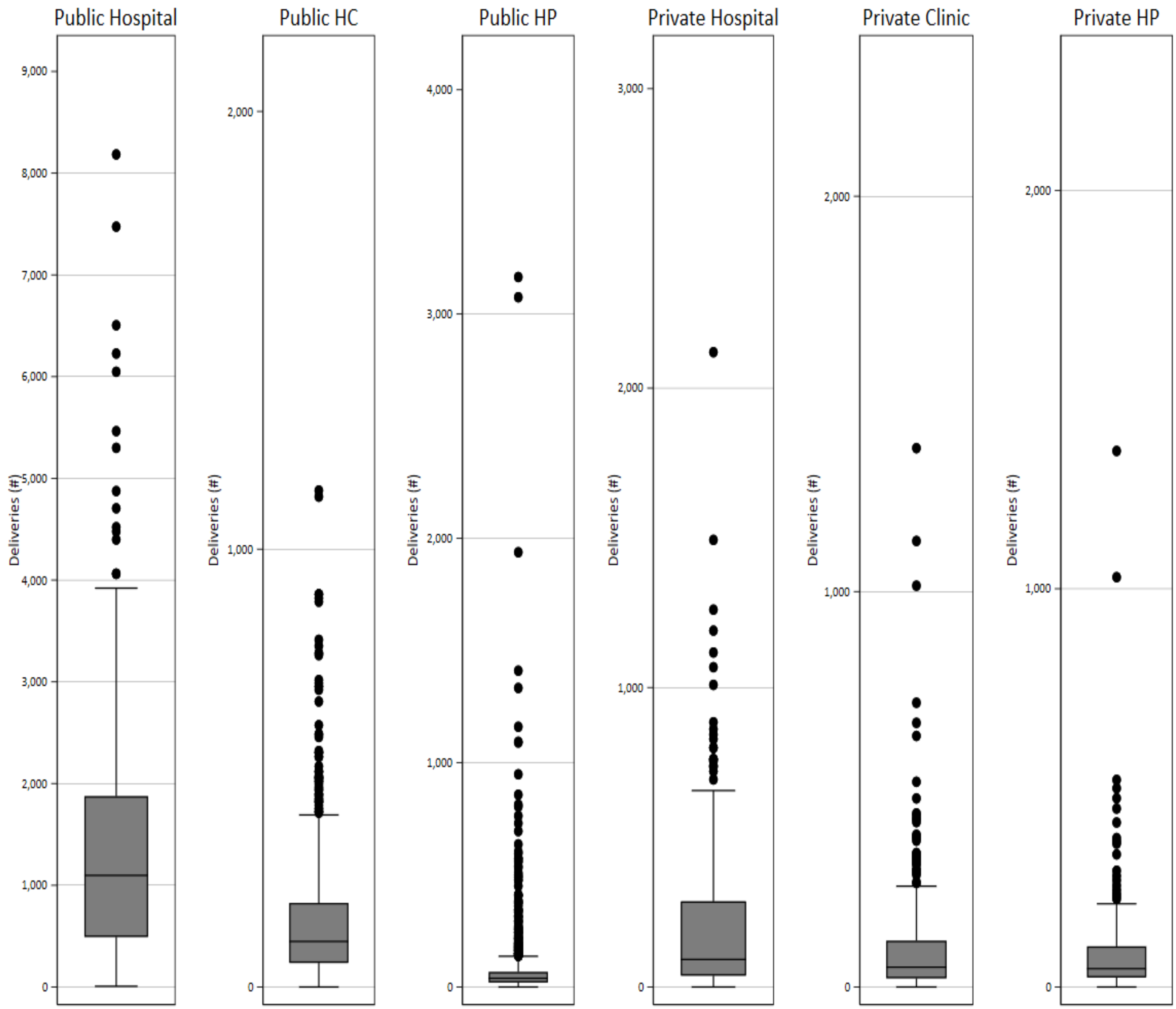






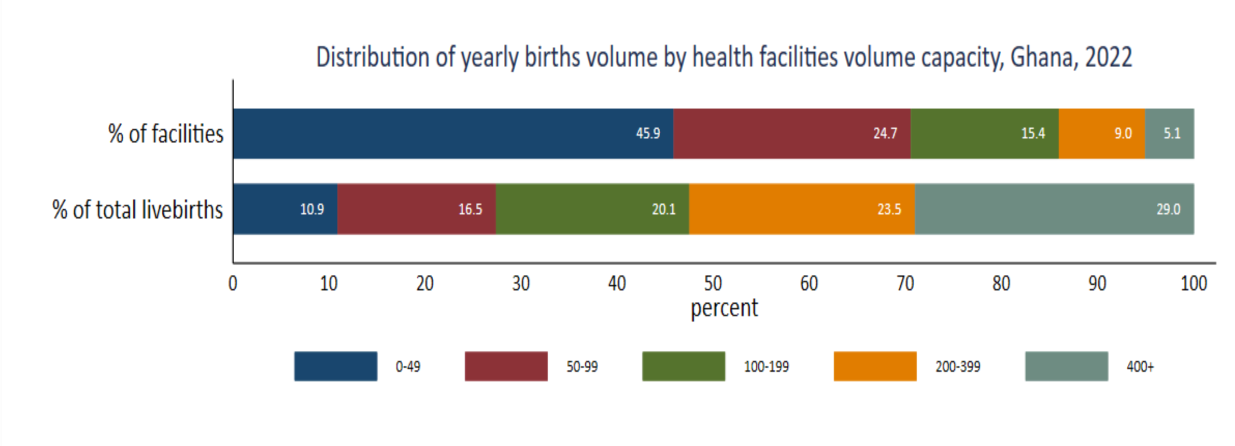
Volume and percentage of institutional births by facility type & ownership (public/private)

The box plot below shows the distribution of the volume of institutional births by facility type & ownership (public/private). The median number of deliveries was higher among public hospitals compared to private facilities.



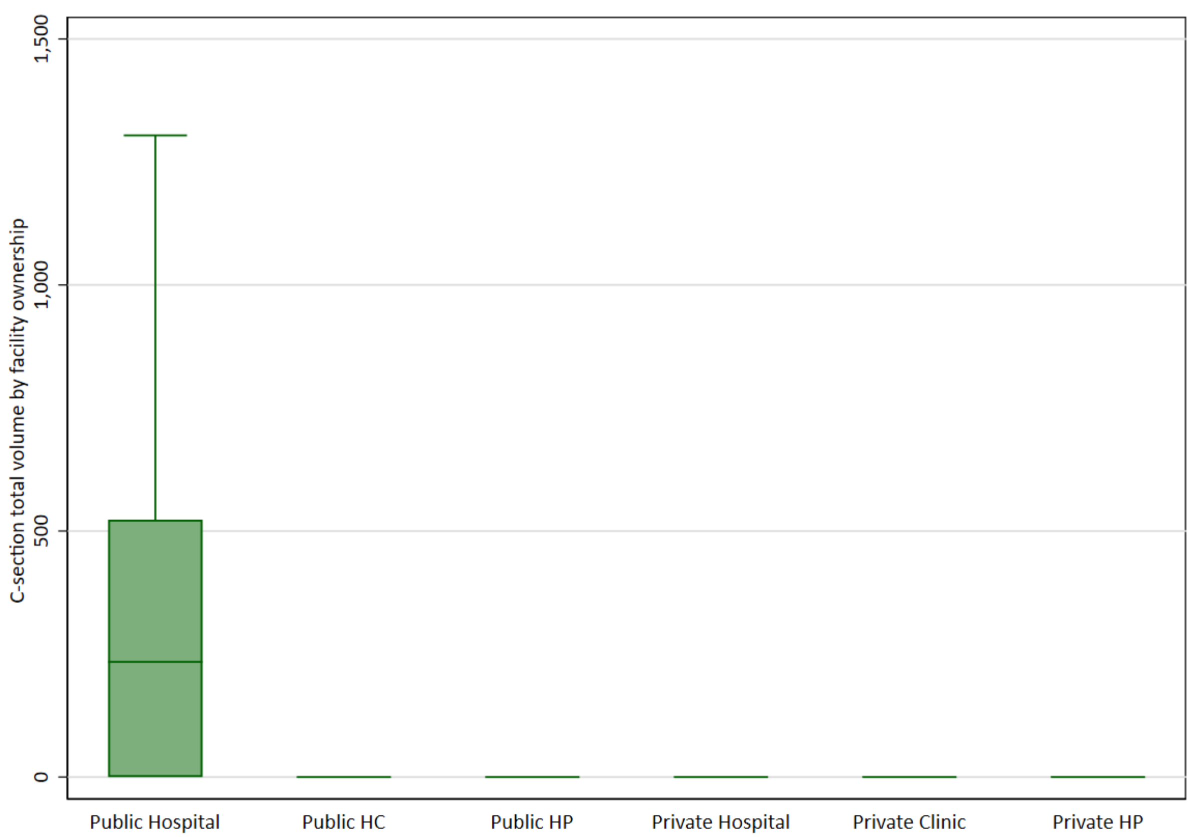
Distribution of total births by the volume of births handled by the health facilities each year (lower bar), and the percentage of facilities by yearly birth volumes (upper bar) in 2022

Approximately 5% of health facilities in Ghana can conduct at least 400 deliveries annually while 46% of facilities are only able to a maximum of 49 deliveries annually. About 29% of all total live births occurred in facilities that can conduct at least 400 deliveries.



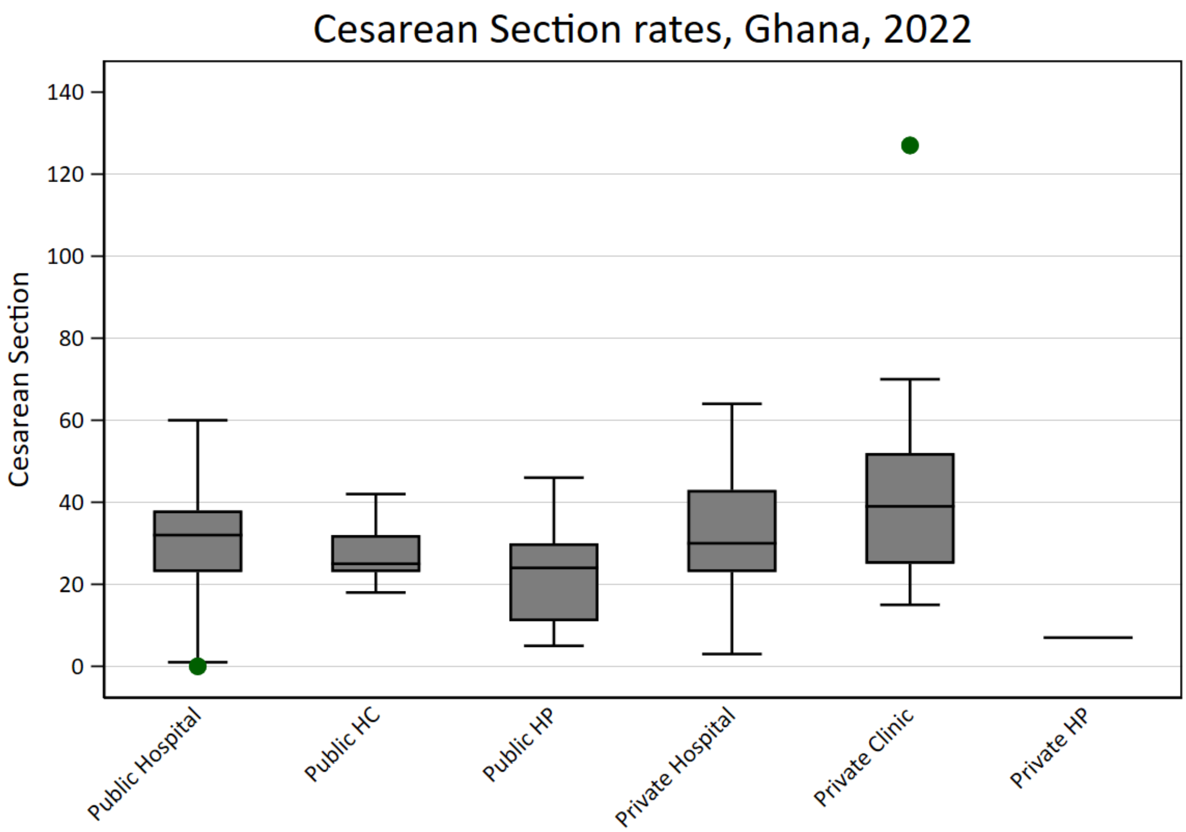
C-section volumes by facility ownership (and type)

The box plot below shows the distribution of CS volumes by facility ownership and most CS were conducted in public hospitals. Most CS are conducted at public facilities because is a bit cheaper and to some extent covered by National Health Insurance.



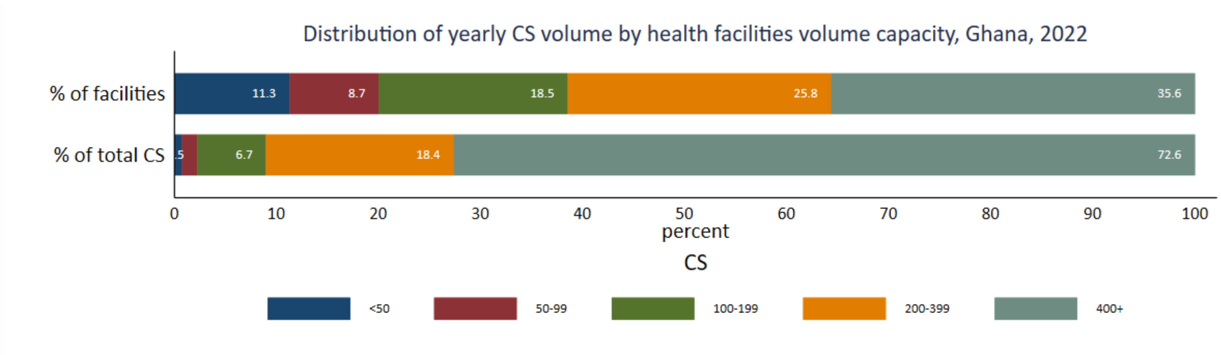
Facility C-section rates (per 100 livebirths) by facility type & ownership (public/private).

The rate of cesarean section per 100 live births was higher among private clinics followed by public and private hospitals.



Distribution of C-sections by the volume of CS handled by the health facilities each year (lower bar) and the percentage of facilities by yearly CS (upper bar) in 2022

Approximately 36% of health facilities conducted at least 400 cesarean sections and about 73% of total CS were conducted at health facilities that conduct a minimum of 400 deliveries annually.



Maternal mortality, stillbirths, and neonatal mortality transition model stages

The following table shows the maternal mortality, stillbirth, and neonatal mortality transition model stages (stage 1 being the highest mortality and stage with lowest mortality), with their median or interquartile range values using empirical data from around 150 countries for mortality levels and causes, fertility transition, childbirth intervention coverage, health system inputs and MNH care strategies. For more information on the source of this model, see related article and related appendix Table 6 below.[21] Many of these select characteristics of each mortality transition stage are useful to consider in the synthesis and recommendations from this study.

Table 6: Summary of mortality transition stages and their characteristics[22]

Transition stage	1 Highest mortality	2	3	4	5 Lowest mortality
Mortality trends					
MMR, per 100,000 live births	≥700	300-700	100-300	20-100	<20
NMR, per 1000 live births	>45	30-45	15-30	<10-15	<5
SBR, per 1000 live births	35+	25-35	15-25	10-15	<10
Cause of death patterns	Infections, health status, and peri-partum complications all major causes	Infections and peri-partum causes decline, health status more important	Infections and peri-partum causes further decline, health status more important	Health status causes for mother/ baby decline but still important	Mostly unpreventable health status related deaths remain

[21] Boerma T, Campbell OMR, Amouzou A, et al. Maternal mortality, stillbirths, and neonatal mortality: a transition model based on analyses of 151 countries. The Lancet Global Health 2023;**11**(7):e1024-e31 doi: https://doi.org/10.1016/S2214-109X(23)00195-X.

[22] Boerma T, Campbell OMR, Amouzou A, et al. Maternal mortality, stillbirths, and neonatal mortality: a transition model based on analyses of 151 countries. The Lancet Global Health 2023;**11**(7):e1024-e31 doi: https://doi.org/10.1016/S2214-109X(23)00195-X. [Appendix, page 29.]

Fertility transition					
Total fertility rate	Very high	High	Moderate	Moderate to low	Low
Abortion policy	Most restrictive				Most permissive
Intervention coverage (interquartile range)					
Institutional delivery	25-48%	43-75%	57-88%	88-99%	Nearly 100%
Hospital deliveries	11-28%	16-34%	28-68%	76-98%	98-100%
C-sections	Below 5%	7-10%	15%	20-30%	30% or more
C-sections among the poorest	0-2%	1-3%	2-11%	7-22%	14-29%
Health system inputs					
Health workforce (physicians, nurses, midwives)	Low density of health workers	Increase in nurses and midwives	Major increase in density, nurse to physician ratio declining	Continued increase in density, due to more physicians	Core health workforce over 100 per 10,000 population
Health financing	Low per capita expenditure, high out of pocket spending (OOPS)	Increasing expenditure, low government share as % of GDP, high OOPS	Same as phase II, continuing	Same as phase III, continuing	Very high health spending, low OOPS
Delivery of MNH care strategies					
Main challenges	Expanding access to all, demand generation	Access/ quality	Access/ quality	Quality	Quality and reaching poorest
Major MNH interventions	Infection control; primary/ essential MNH care	+BEmONC, expanding CEmONC for complications	+BEmONC, full CEmONC	+ specialized care; small, sick newborn	+Universal access to CEmONC and specialized small/ sick newborn care

The Table below shows the MMR, NMR (and SBR) mortality levels in Ghana for the years 2000 and 2021 and the mortality transition. Synthesis of the transition phase model. Within the past two decades, Ghana has transitioned from phase 2 to phase 3 based on changes in mortality levels between 2000 and 2021. This could be attributed to an increase in intervention coverages (percentage of institutional and hospital deliveries and overall cesarean section), an increase in the number of qualified health practitioners, health infrastructure, financing, implementation of the free maternal healthcare policy to increase access to quality and affordable maternal and neonatal health services, the implementation of the Community-based Health Planning Services (CHPS) to reduce barriers to geographical access to health care and provide community-based care to underserved populations through training and deploying nurses as Community Health Officers (CHOs). These CHOs provide door-to-door services for the catchment area of their “CHPS zone,” as well as basic services at community-based CHPS compounds. These are among the few interventions that have been put in place to improve MNH services.

Table 7: Mortality transition stages since 2000

	NMR	SBR	MMR	Transition phase based on mortality levels in Table 6
2000 (or similar year)	**36**	**28**	**499**	**2**
2021 (or similar year)	**23**	**22**	**263**	**3**

Source: Demographic and health surveys conducted between 2003 and 2022

Synthesis of findings

The synthesis of the results of the MNH services in Ghana showed that there are sufficient institutional delivery and C-section rates, and appropriate volumes by facility levels (hospitals, lower level)/birth attendants who are meant to be providing routine or emergency care according to national policies/guidelines. However, there are disparities in access to CS rate, institutional delivery care coverage and NMR levels between urban-rural residence, regions, and wealth quintile groups. Trend analysis showed that NMR has significantly reduced among facility-based deliveries. In the context of mortality transition, changes in mortality levels between 2000 and 2021 showed that Ghana has transitioned from phase 2 to phase 3, and more needs to be done to reach phase 4 by 2030 especially by improving the quality of maternal and newborn services, creating awareness on ANC attendance, facility-based deliveries and postnatal care and utilization of modern contraceptives and making CS accessible to marginalized populations.

Recommendations for future strategies

- Cesarean section should be made accessible to all women of reproductive age independent of the socio-economic status of the woman. CS must be covered under the national health insurance scheme to increase access to women from poor households.
- There must be a conscious effort to provide emergency MNH services at a lower level of health facilities by assigning well-trained health professionals to rural communities to offer these services at a lower cost or by utilizing a network of practices where we employ a more efficient and effective referrals system to provide emergency MNH services.
- Future studies may conduct a cost-effectiveness analysis of integrating emergency MNH services into lower-level health facilities which are largely patronized by the poor and marginalized populations, but they are not mandated to provide emergency MNH services such as cesarean sections.