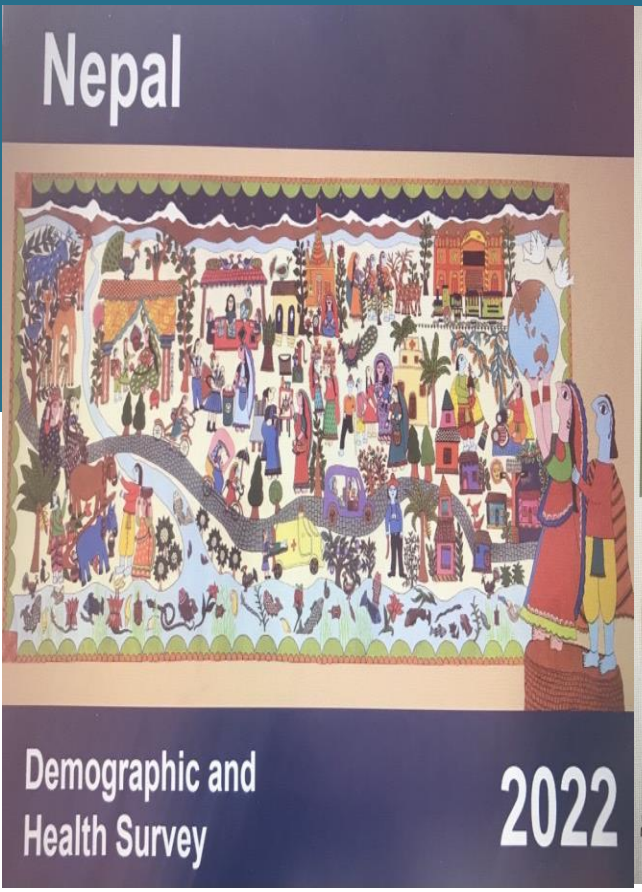
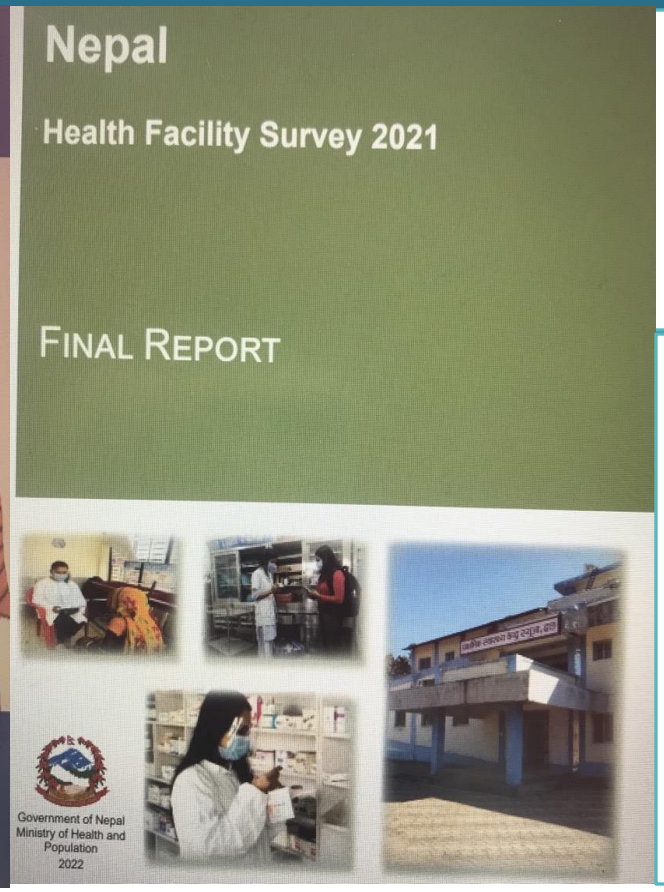
Effective coverage of births in health facilities in Nepal: Cross-sectional study combining Demographic and Health survey 2022 and Health Facility Survey 2021





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Background

- Despite increasing percentage of births in health facilities, maternal mortality remains a concern.

- Crude intervention coverage (e.g. contact with health system) does not take into account quality of care provided.

- Evidence showed factoring in quality of care substantially reduces effective coverage of many maternal and child health services.

- Enabling environment -
  - competency of skilled birth attendants (SBA),
  - essential infrastructure,
  - equipment,
  - medications,
  - consumables,
  - professional support, transport and
  - effective timely referral system

Objective

To estimate the effective coverage of facility-based childbirth in Nepal

Methods

Demographic and Health Survey (DHS) 2022

Extracted data:

- women's characteristics and self-reported place of birth (facility type)
- person assisting during delivery (health provider)

Sample (n=1977):

- all women ages 15–49 years
- most recent live/still births within 2-year recall period
- most qualified person (health provider) reported

Health Facility Survey (HFS) 2021

Extracted data:

- Inventory of equipment and types of health providers

Sample (n=804):

- all facilities conducting delivery service
  - Government hospitals (federal, provincial and local)
  - Private hospitals
  - Primary health care centres (PHCC)
  - Health post (HP)
  - Community health unit (CHU)
  - Urban health centre (UHC)

Methods

- **Descriptive analysis** of:
  - **DHS data** - % of births by facility type and health providers
  - **HFS data** - % of facility type with an enabling environment

- **Combined analysis** - multiplied the DHS and HFS results to estimate the % of births in different facility and the overall national coverage in an enabling environment

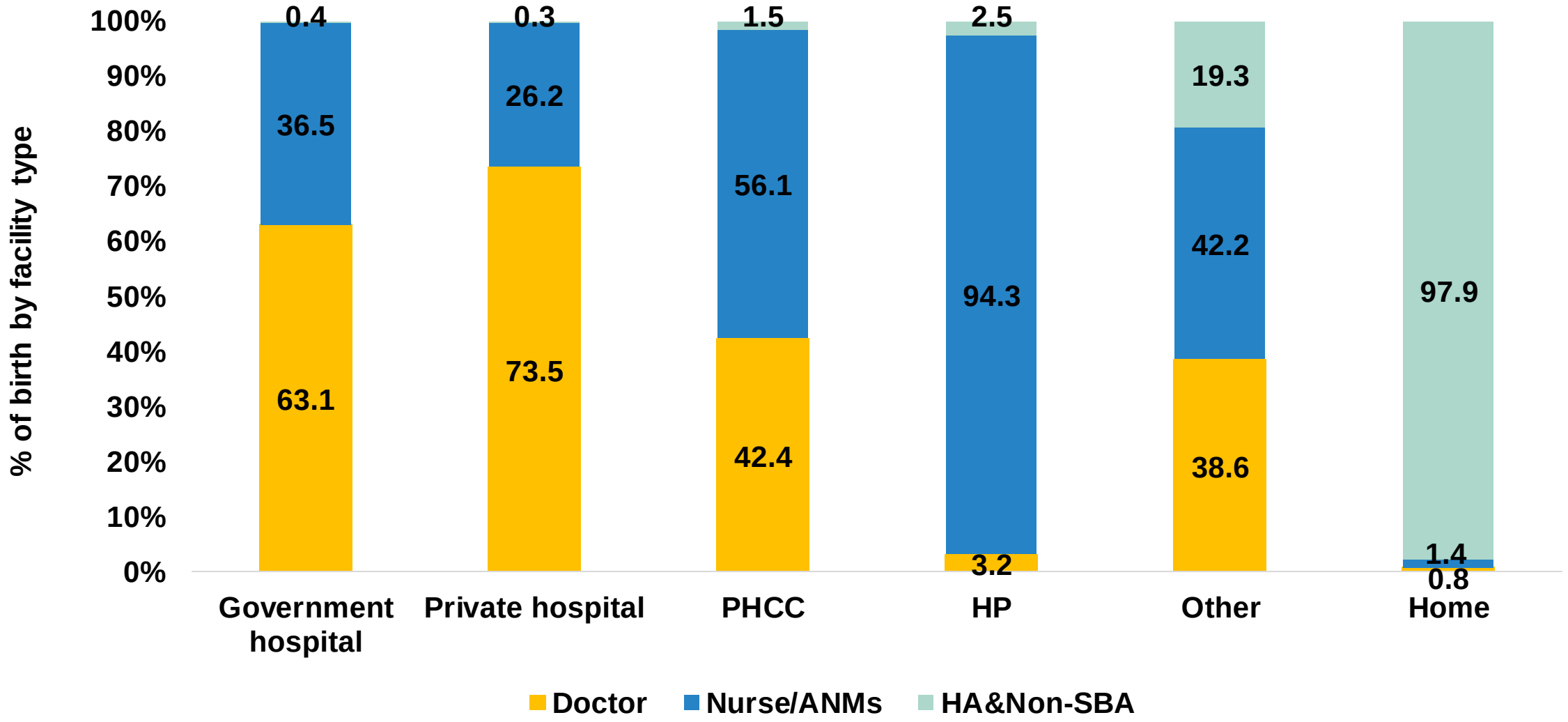
- All analysis of both the DHS and the HFS **accounted for the complex survey design**

Harmonized category	Demographic and Health Survey (DHS) response options	Health Facility Survey (HFS) response options
Facility type	**Facility response category**	**Facility response category**
Government hospital	Government hospital	Federal level hospital Provincial level hospital Local level hospital
Private hospital	Private hospital	Other hospital (private, non-state owned)
Primary health care center (PHCC)	PHCC/primary hospital	PHCC
Health post (HP)	Health post Basic health care center	Health post
Other	Community Health Unit Urban Health Center Other public sectors Private clinics and NGO	Community Health Unit Urban Health Center
Health providers	**Health providers response category**	**Health providers response category**
*Doctors	Doctors	Generalist medical doctor (MDGP) Gynecologist/obstetrician Medical officer (MBBS)
*Nurse/auxiliary nurse midwives	Nurse/midwife	Nurse (Masters, Bachelors, Certificate level, midwife) Auxiliary nurse midwife (ANM)
Health assistant (HA)	Health assistant/ Auxiliary health worker	Health assistant/ Auxiliary health worker/ Senior auxiliary health worker/ Public health inspector
Other non-SBA	Traditional birth attendants Female community health volunteers Relative/friends Other No one assisted	Anesthetic assistant Other clinical staff
**Doctors, nurses and auxiliary nurse midwives are skilled birth attendants (SBA)*		

Enabling environment	Indicators	Definitions
Routine deliveries	**Improved water source**	*Observed most common water sources - pipe into facility, piped onto facility ground, public tap/standpipe, tube well/borehole, protected spring and dug well, rainwater, bottled water present and available within 500 meters*
	Improved sanitation	*Observed client latrine useable, functional and private with soap and water present by the toilet*
	Improved hand hygiene facilities	*Observed running water present and hand-washing/liquid soap/alcohol-based hand rub available*
	Power source	*Connected to national electricity or other alternative sources available*
	Transportation	*Functional ambulance or other vehicle for emergency transport at facility, driver present or other vehicle stationed in another facility, and fuel available*
	Communication service	*Observed functional landline telephone or cell phone*
	Essential equipment and supplies – 13 items	*Observed functional - fetoscope, baby weighing machine, blood pressure apparatus, suction apparatus, manual vacuum extractor, vacuum aspiration kit, neonatal bag and mask, examination light, sterilization equipment and blank partograph, delivery bed, gloves, delivery sets present*
	Essential drugs/medicines – 5 items	*Observed injectable antibiotic, injectable uterotonic, injectable magnesium sulfate, skin antiseptic, intravenous fluid with infusion set (at least one valid)*
BEmONC and CEmONC	**Basic Emergency Obstetric and Newborn Care (BEmONC) – 7 signal functions**	*Routine + ever provided parenteral administration of antibiotics, parenteral administration of oxytocic, parenteral administration of anticonvulsant for hypertensive disorders of pregnancy, assisted vaginal delivery, manual removal of placenta, removal of retained products of conception and neonatal resuscitation*
	Comprehensive Emergency Obstetric and Newborn Care (CEmONC) – 9 signal functions	*Routine + BEmONC signal functions + ever provided cesarean section and blood transfusion*

DHS RESULTS

Percentage of births by person and place (DHS 2022, n=1977)



HFS RESULTS

% of facility type with enabling environment for routine delivery (HFS 2021, n=804)

S.N	Enabling environments for routine delivery	Government hospital (n=41) [% 95% CI]	Private hospital (n=61) [% 95% CI]	PHCC (n=50) [% 95% CI]	Health post (n=609) [% 95% CI]	*Other (n=43) [% 95% CI]
1	Improved water source	100.0 [85.6-99.9]	98.4 [90.0-99.9]	98.0 [89.8-99.9]	97.9 [96.3-98.8]	95.3 [82.9-99.2]
2	**Improved sanitation**	78.0 [61.9-88.9]	90.2 [79.1-95.9]	76.0 [61.5-86.5]	69.3 [65.4-72.9]	66.7 [51.3-80.5]
3	Hand hygiene facilities	97.6 [85.6-99.9]	88.5 [77.2—94.9]	94.0 [82.5-98.4]	78.6 [74.9-81.6]	51.2 [35.7-66.4]
4	Power source available	100.0 [89.33-100.0]	100.0 [92.6-100.0]	100.0 [91.0-100.0]	100.0 [99.2-100.0]	93.0 [79.9-98.2]
5	**Communication service available**	78.0 [61.9-88.9]	96.7 [87.6-99.4]	44.9 [30.3-58.7]	22.8 [19.6-26.4]	7.0 [1.8-20.1]
6	Transportation available	95.1 [82.2-99.2]	96. [87.6-99.4]	88.0 [74.9-95.0]	79.3 [75.8-82.4]	69.8 [53.7-82.3]
7	Fetoscope	97.6 [85.6-99.9]	88.5 [77.2-94.9]	94.0 [82.5-98.4]	95.2 [93.1-96.7]	97.9 [86.2-99.9]
8	Baby weighing machine	97.6 [85.6-99.9]	88.7 [79.1-95.9]	94.0 [82.5-98.4]	95.2 [92.9-96.6]	83.7 [68.7-92.7]
9	BP instrument	97.6 [85.6-99.9]	91.8 [81.2-96.9]	94.0 [82.5-98.4]	95.4 [93.1-96.7]	97.7 [86.2-99.9]
10	**Suction apparatus**	95.1 [82.2-99.2]	88.7 [77.1-94.9]	90.0 [77.4-96.3]	61.8 [57.7-65.6]	30.2 [17.7-46.3]
11	**Manual vacuum extractor**	71.4 [54.3-83.4]	58.1 [45.7-71.2]	40.0 [26.7-54.8]	16.3 [13.5-19.5]	4.8 [0.8-17.1]
12	**Vacuum aspiration or MVA kit**	75.6 [59.4-87.1]	67.2 [53.9-78.4]	44.0 [30.3-58.7]	12.0 [9.6-14.9]	2.4 [0.1-13.7]
13	Neonatal bag and mask	100.0 [89.33-100.0]	83.6 [71.5-91.4]	98.0 [87.9-99.9]	92.6 [90.2-94.5]	74.4 [58.5-85.9]
14	Blank partograph	97.6 [85.6-99.9]	69.4 [55.6-79.8]	90.0 [77.4-96.3]	93.4 [90.9-95.1]	71.4 [56.1-84.2]
15	Examination light	97.6 [85.6-99.9]	93.5 [83.3-97.9]	96.0 [85.1-99.3]	94.1 [91.6-95.6]	83.7 [68.7-92.7]
16	Delivery bed	100.0 [89.33-100.0]	95.1 [85.4-98.7]	100.0 [91.0-100.0]	99.2 [97.8-99.6]	97.6 [86.2-99.9]
17	Gloves	97.6 [85.6-99.9]	93.4 [83.3-97.9]	94.0 [82.5-98.4]	98.0 [96.5-98.9]	97.7 [86.2-99.9]
18	Sterilization equipment	97.6 [85.6-99.9]	98.4 [90.0-99.9]	88.0 [74.9-95.0]	86.7 [83.7-89.2]	69.8 [53.7-82.3]
19	Delivery sets	100.0 [89.33-100.0]	90.2 [79.1-95.9]	98.0 [87.9-99.9]	97.7 [95.8-98.6]	95.3 [82.9-99.2]
20	Injectable antibiotic	81.0 [67.4-92.3]	75.8 [62.4-85.2]	84.0 [70.3-92.4]	63.9 [59.9-67.7]	48.8 [33.6-64.3]
21	Injectable uterotonic	97.6 [85.6-99.9]	85.5 [73.3-92.6]	98.0 [87.9-99.9]	98.0 [96.5-98.9]	95.3 [82.9-99.2]
22	Injectable magnesium sulfate	95.1 [82.2-99.2]	69.4 [55.5-79.7]	86.0 [72.6-93.7]	69.6 [65.6-73.1]	46.5 [31.5-62.2]
23	Skin antiseptic	100.0 [89.33-100.0]	90.3 [79.1-95.9]	100.0 [91.0-100.0]	98.7 [97.1-99.3]	97.7 [86.2-99.9]
24	Intravenous fluid with infusion set	97.6 [85.6-99.9]	88.7 [77.2-94.9]	98.0 [87.9-99.9]	98.2 [96.7-99.0]	93.0 [79.9-98.2]
	All indicators for routine delivery	**36.6 [22.6-53.1]**	**29.5 [18.9-42.7]**	**10.0 [3.7-22.6]**	**0.0 [0.0-0.78]**	**0.0 [0.0-10.2]**

% of facility type with enabling environments for BEmONC and CEmONC (HFS 2021, n=804)

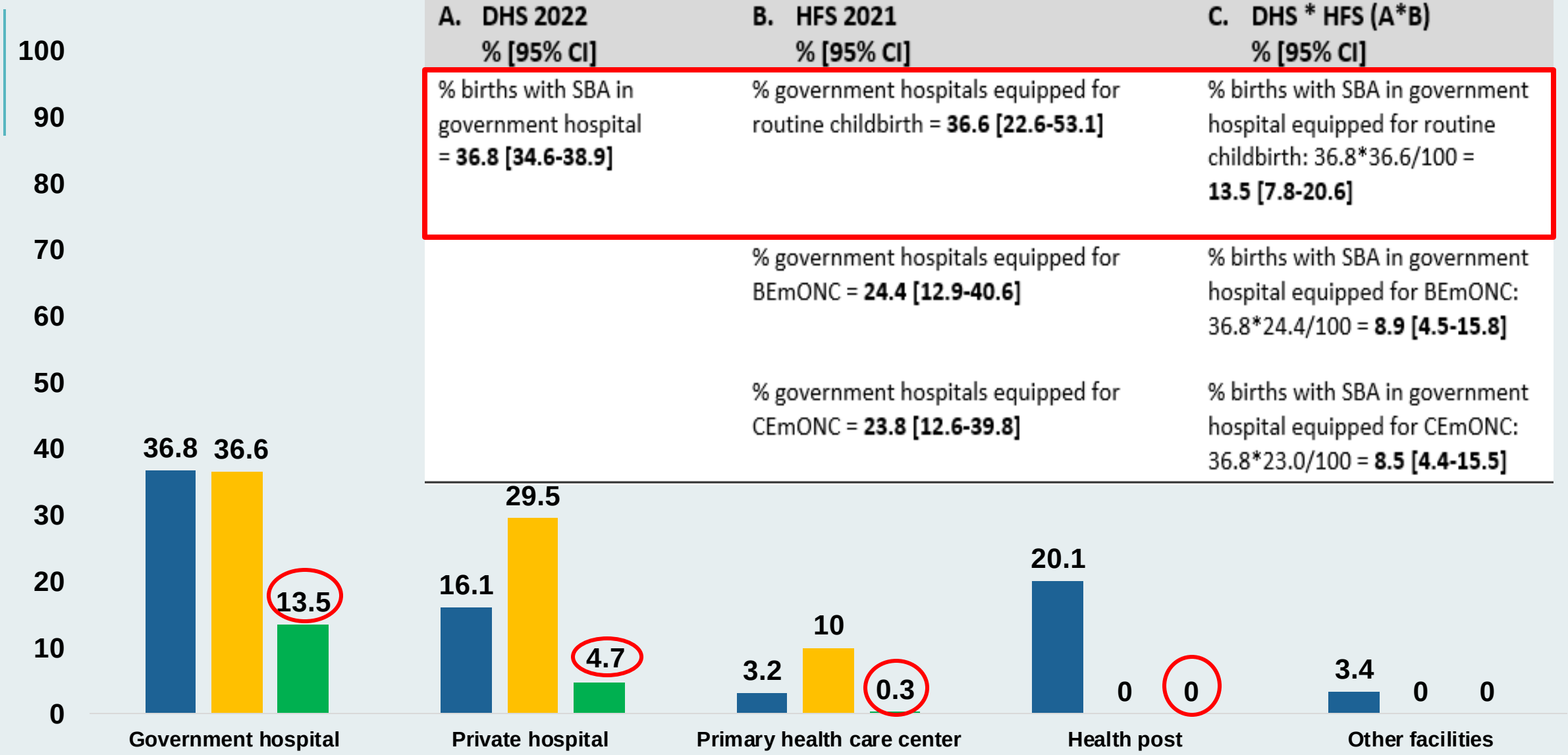
Enabling environments for BEmONC and CEmONC	Government hospital (n=41) % [95% CI]	Private hospital (n=61) % [95% CI]	PHCC (n=50) % [95% CI]	Health post (n=609)% [95% CI]	Other (n=43) % [95% CI]
BEmONC signal functions ever provided					
1. Parenteral administration of antibiotics (IV or IM)	83.3 [67.4-92.3]	90.3 [79.1-95.9]	80.0 [65.9-89.5]	52.2 [48.2-56.2]	33.3 [19.5-48.7]
2. Parenteral administration of oxytocic (IV or IM)	97.6 [85.6-99.9]	95.1 [85.4-98.7]	98.0 [87.9-99.9]	94.4 [92.0-95.9]	97.7 [86.2-99.9]
3. Parenteral administration of anticonvulsant for hypertensive disorders of pregnancy (IV or IM)	83.3 [67.4-92.3]	75.8 [62.4-85.2]	42.0 [28.5-56.7]	22.5 [19.3-26.1]	4.7 [0.8-17.1]
4. Assisted vaginal delivery	66.7 [49.3-79.4]	68.9 [55.6-79.8]	26.0 [15.1-40.6]	7.6 [5.6-10.0]	2.3 [0.1-13.8]
5. Manual removal of placenta	92.7 [78.9-98.1]	82.3 [69.6-90.2]	82.0 [68.1-90.9]	55.8 [51.6-59.6]	37.2 [23.4-53.3]
6. Removal of retained products of conception	81.0 [67.3-92.3]	77.4 [64.2-86.5]	72.0 [57.3-83.3]	39.4 [35.5-43.4]	14.3 [5.8-28.6]
7. Neonatal resuscitation	92.7 [78.9-98.1]	78.7 [65.9-87.8]	80.0 [65.9-89.5]	57.2 [53.1-61.1]	30.2 [17.7-46.3]
All indicators for routine + BEmONC	**24.4 [12.9-40.6]**	**24.2 [14.6-37.0]**	**2.0 [0.1-12.0]**	**0.0 [0.0-0.8]**	**0.0 [0.0-10.2]**
CEmONC signal functions ever provided					
8. Cesarean section	61.0 [44.5-75.4]	77.0 [64.2-86.5]	2.0 [0.1-12.0]	0.0 [0.0-0.78]	0.0 [0.0-10.2]
9. Blood transfusion	61.9 [44.5-75.4]	83.6 [71.5-91.4]	2.0 [0.1-12.0]	0.3 [0.0-1.31]	0.0 [0.0-10.2]
All indicators for routine + CEmONC	**23.8 [12.6-39.8]**	**23.0 [13.5-35.8]**	**0.0 [0.0-8.9]**	**0.0 [0.0-0.8]**	**0.0 [0.0-10.2]**

***PHCC** = Primary Health Care Center; ***Other** = Community health unit & Urban health center*

COMBINE RESULTS [DHS & HFS]

Percentage coverage of facility-based births in enabling environments for routine delivery

A. DHS 2022 % [95% CI]	B. HFS 2021 % [95% CI]	C. DHS * HFS (A*B) % [95% CI]
% births with SBA in government hospital = **36.8 [34.6-38.9]**	% government hospitals equipped for routine childbirth = **36.6 [22.6-53.1]**	% births with SBA in government hospital equipped for routine childbirth: 36.8*36.6/100 = **13.5 [7.8-20.6]**
	% government hospitals equipped for BEmONC = **24.4 [12.9-40.6]**	% births with SBA in government hospital equipped for BEmONC: 36.8*24.4/100 = **8.9 [4.5-15.8]**
	% government hospitals equipped for CEmONC = **23.8 [12.6-39.8]**	% births with SBA in government hospital equipped for CEmONC: 36.8*23.0/100 = **8.5 [4.4-15.5]**



Overall national effective coverage	
% births with SBA in all health facilities equipped for routine delivery	18.5%
% births with SBA in all health facilities equipped for BEmONC	12.9%
% births with SBA in all health facilities equipped for CEmONC	12.2%

Conclusion

- This study revealed a **deficit in essential indicators** across health facilities to provide enabling environments for routine and complicated childbirths.
- Combining data from both surveys suggest a reality where, **at most, two out of every ten births occurred in health facilities with SBA and in an enabling environment**.
- Contributes valuable evidence to policymakers, urging to focus on **improving the enabling environment for childbirth** for achieving maternal and newborn health goals.
- Not enough to focus on expanding crude intervention coverage, **attention must also be directed towards improving quality of care** in facilities.

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THANK YOU

Short biography

Ms. Karki is a public health researcher with over 7 years of experience. She possesses comprehensive expertise that extends across maternal and child health, particularly in employing mixed methods approaches, and she has an enriching experience in the field of implementation science.