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Stillbirth rate in Bhutan: a retrospective facility-based study

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ABSTRACT

Introduction: Stillbirth is an important public health concern; yet there is no reliable stillbirth rate for Bhutan. Hence the aim of this study was to estimate the stillbirth rate for Bhutan. **Methods:** A retrospective study was carried out for live and stillbirths recorded in delivery registers of all 253 health facilities across the country for a period of one year commencing 1st January till 31st December 2015. **Results:** There were a total of 11,126 live births and 108 stillbirths documented in delivery registers. The stillbirth rate from this data set was 10 per 1000 live births. **Conclusions:** The stillbirth rate for Bhutan from this study is 10 per 1000 live births lower than 16 per 1000 live births estimated in Lancet Series 2015. In order to find the true burden of stillbirths in the country, a surveillance may be instituted which can facilitate the prevention efforts while at the same time enable to strengthen information system.

Keywords: Health facility; Live birth; Stillbirth.

INTRODUCTION

World Health Organization (WHO) defines stillbirth as a fetal death at gestational age at or after 28 completed weeks or weighing at least 1,000 grams or a crown-heel length of at least 35 centimeters[1]. Birth weight and gestational age threshold do not give equivalent result. Birth weight-based definition gives a lower stillbirth rate than based on gestational age years[2]. As such, gestational age threshold which is recommended due to a better predictor of maturity[3] was applied in this study in preference to birth weight or length.

Globally, over 2.6 million stillbirths continue to occur each year with majority (98%) in developing countries[4]. While average stillbirth rate (SBR) estimated for the world in 2015 was 18.4 per 1000 live births, estimates for South Asia was 25.5 per 1000 live births only next to Sub-Saharan Africa at 28.7 per 1000 live births and that for developed countries was estimated at 3.4 per 1000 live births in 2015[2]. Top ten countries having highest number of stillbirths were India (592,000), Nigeria (314,000), Pakistan (243,000), China (122,000), Ethiopia (97,000), Democratic Republic of the Congo (88,000), Bangladesh (83,000), Indonesia (73,000), Tanzania (47,000) and Niger (36,000) while countries with some of the highest SBR are Pakistan (43.1), Nigeria (42.9), Chad (39.9), Guinea-Bissau (36.7), Niger (36.7), Somalia (35.5), Djibouti (34.6), Central African Republic (34.4) Togo, (34.2) Mali (32.5) per 1000 births[2].

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SBR of 16 per 1000 births for 2015 was estimated for Bhutan based on regional estimates[2]; however it may not depict an actual picture, especially as Bhutan has well-established primary health care, good antenatal care coverage and institutional and skilled birth attendant rate have drastically improved in the past years. Although a hospital-based study with data from 2006-2008 estimate SBR at 17.72 per 1000 live births[5], the definition did not conform to that of WHO and hence its comparability.

Despite stillbirth rates being an important quality indicators of antenatal and obstetric care[6], attention by health systems for stillbirth is low[7]. But with the launch of Bhutan every newborn action plan (2016-2023)[8] in 2017, Bhutan has given impetus to reducing preventable stillbirths with a SBR target of 12.1 or fewer stillbirths per 1000 live births by 2023[9,10]. Without the baseline, it would be difficult to track the progress, and thus this study was critical to determine the SBR for Bhutan.

METHODS

This retrospective study involved collection of information on live births and stillbirths (between 1st January and 31st December 2015) from the delivery registers maintained at all health facilities across the country.

Data Collection

The researchers collected the data by obtaining administrative clearance from the Policy and Planning Division, Ministry of Health and ethical clearance from the Research Ethics Board of Health of Bhutan (REBH approval letter No.REBH/Approval/2016/042). The Department of Public Health under the

Ministry of Health facilitated in informing all the District Health Officers to support the researchers to enable them to collect the data from all the health facilities including the Basic Health Units under their jurisdictions. Thus, all the district hospitals and BHUs were informed especially the mother and child health clinics and healthcare providers in these units were instrumental in unpacking records during the data collection. Additionally, in the national referral hospital in Thimphu, eastern regional referral hospital in Mongar and central regional referral hospital in Sarpang, MCH clinics were approached for data collection through the medical superintendents. Chief Medical Officers were contacted in those health facilities, including Gidakom hospital, Phuntsholing general hospital, Deothang hospital, under the Ministry of Health. Wherever the researchers could not physically visit the health facility, telephonic communication was used as means to collect data.

Setting

Bhutanese health system is three-tiered; two regional referral hospitals and one national referral hospital at tertiary level, 25 district hospitals and general hospitals including military hospitals at secondary level and 25 basic health unit grade I, 185 basic health unit grade II, 26 sub-posts and 553 outreach clinics at primary level. Each of these health facilities has mother and child health clinics where every pregnant woman is registered and records on live births and stillbirths are maintained in the delivery register maintained in all the health facilities.

Data analysis

Data collected was entered in the computer, cleaned and Microsoft excel was used for analysis. The main outcome measure was stillbirth rate calculated as stillbirths per 1000 live births.

RESULTS

There were a total of 11,126 live births and 108 stillbirths recorded in delivery registers. The total number of live births and stillbirths by dzongkhags (districts) are given in the Table 1.

A total of 5514 live births from referral hospitals, 3789 live births from district and other hospitals, 763 live births from BHU Is and 1060 live births from BHU II were recorded from delivery registers. Similarly, 52 stillbirths from referral hospitals, 45 stillbirths from district and other hospitals, 4 stillbirths from BHU I, and 7 stillbirths from BHU II were recorded from the delivery registers (Table 2).

Stillbirth rate (SBR)

SBR was derived based on total births (live and stillbirths) and stillbirths recorded in the health facilities. Based on the stillbirth rate from institutional delivery record the rate was 10 per 1000 live births

DISCUSSION

Stillbirths is a neglected but urgent global public health concern[11]. Based on UNCIEF's estimation, Bhutan's NMR was 18.1 per 1,000 live births and thus a total number of newborn deaths

Table 1. Total Dzongkhag-wise Live and Stillbirth for 2015

Sl. No.	Dzongkhag	Institutional Delivery Records	
		Live birth	Stillbirth
1	Bumthang	148	0
2	Chhukha	1104	14
3	Dagana	123	0
4	Gasa	3	0
5	Haa	110	1
6	Lhuentse	102	2
7	Monggar	1003	13
8	Paro	492	2
9	Pemagatshel	212	0
10	Punakha	536	9
11	Samdrup Jongkhar	477	5
12	Samtse	545	11
13	Sarpang	937	8
14	Thimphu	3899	35
15	Trashigang	511	7
16	Trashiyangtse	161	0
17	Trongsa	96	1
18	Tsirang	180	0
19	Wangdue phodrang	309	0
20	Zhemgang	178	0
Total		**11,126**	**108**

Table 2. Live and stillbirth recorded in delivery registers by levels of health facilities

	Total	Referral Hospitals	Other Hospitals	BHU I	BHU II
Live birth	11,126 (100%)	5,514 (49.5)%)	3,789 (34.1%)	763 (6.9%)	1,060 (9.5%)
Stillbirth	108 (100%)	52 (48.2%)	45 (41.7%)	4 (3.7%)	7 (6.4%)

is 270 in 2015, implying about 270 stillbirths in Bhutan each year. Further, comparing among the annual rate of reduction for maternal mortality ratio, neonatal mortality rate and stillbirth birth rate of 3.6, 3.9 and 3.4 % , the annual rate of reduction for stillbirth was the slowest among the three indicators[2,12].

In our study, the stillbirth rate from institutional delivery record was 10 per 1000 live births (the researchers explored the MCH record and annual household survey records and found nearly similar figures to that of delivery registers). The estimate of SBR for Bhutan by Hannah and colleagues[2] was 16.0 per 1,000 live births for 2015. The higher estimate could be attributed to modeling based on population and housing census of Bhutan 2005[13]. Further, the trend in reduction would have improved with increasing antenatal coverage and quality, and institutional delivery rates[14-16] over the past years. Other countries having similar SBR are Brazil and China at 10, Fiji at 13, Egypt and Ecuador at 12 and Algeria and Mongolia at 11 per 1000 live births[17]. A hospital-based study in national referral hospital in Thimphu estimated a stillbirth rate of 17.72 per 1000 live births from 2006-2008[5], but their inclusion criterion in that study was all the stillbirths weighing more than 500 grams, focused on birth weight-based approach and thus does not conform to the definition of stillbirth for international comparison. This inclusion criterion may have influenced the total number of stillbirths considerably consequently inflating the stillbirth rate.

This study had captured around 86 percent of live births with 11,126 total deliveries in the facility and attended at home against a total number of 12,860 pregnancies and deliveries expected in 2015[20]. However, MCH record in the health facility reported only 11,122 deliveries[15] indicating a possible gap with under reporting.

Under reporting could also be discussed considering the NMR of 21 per 1000 live births[14]. At the annual rate of reduction at 3.4 percent, stillbirth rate of Bhutan is estimated at 16.6 per 1000 live births (108*2/12860) a possible of around 50% of gaps in reporting or implying a much higher rate of reduction. Thus, unless otherwise there was significant improvement in the annual rate of reduction greater than the estimated one, it is possible that there is underreporting and the need to address this important gap. Such gaps may be intervened through implementation of mother and child tracking system, institutionalization of stillbirth surveillance, improvement of quality maternal care especially during antenatal stages and labor monitoring.

The study was not without its limitation; the researchers observed incomplete data in the institutional delivery records in some of the health facilities indicating the underreporting gaps and stillbirths occurring at home were not tracked. This study sheds some light on the burden of stillbirths in Bhutan. However, true rate is inconclusive due to differences between estimated stillbirth rate and the one found from this study. In order to arrive at a definite SBR, stillbirth surveillance may be instituted to understand the true magnitude of stillbirths while at the same time efforts should be made to improve the quality of existing data source with a special focus on stillbirths through periodic monitoring and supervision.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:
PL : Concept, design, data collection and analysis, manuscript writing and review.
KJ : Concept, design, data collection and analysis, manuscript writing and review.
VJ : Concept, design, data collection and analysis, manuscript writing and review.
CM : Concept, design, data collection and analysis, manuscript writing and review.
LT: Concept, design, data collection and analysis, manuscript writing and review.
TT : Concept, design, data collection and analysis, manuscript writing and review.
Authors agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

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