

# Utility of Expert Panel to Identify Preventable Perinatal Deaths: Results from Audit Based Interventional Study in Two Districts of Karnataka State, India

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## ABSTRACT

**Background:** India has child death review which misses the information from private hospitals and community. Community based perinatal death auditing is required to identify preventable perinatal deaths. The objectives are to know utility of expert panel in an audit-based approach to identify 1). preventable perinatal deaths, 2) Risk factors in cases of perinatal deaths

**Methodology:** Perinatal death auditing was conducted in two districts of Karnataka state. As a part of audit system, an expert panel consisting of paediatricians and obstetricians was formed for each district. The panel met every month and received information about perinatal deaths occurring in the hospitals (government and private) apart from the community in these districts. The panel considered available information about survival chances and care provided to decide if a perinatal death was preventable, possibly preventable or not preventable.

**Results:** Proportion Of identified preventable and possibly preventable perinatal deaths in Koppal District (60%, 20%) was higher than Dakshina Kannada district (34.4%, 30.2%). The proportion preventable intranatal and neonatal risks in Koppal District (79%, 66%) was higher than Dakshina Kannada District (47%, 19%).

**Conclusion:** Expert panel is useful to identify preventable perinatal deaths. The pattern of risk identified has implications for improvements in quality of care provided to high-risk cases.

**Keywords:** Expert Panel; Perinatal Death Auditing; Preventable Perinatal Deaths; Risk Identification

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## INTRODUCTION

Global burden of neonatal and perinatal deaths has been estimated to be about 5 million.<sup>1,2</sup> It is estimated that still births account for one million and newborn deaths three million.<sup>3,4</sup> Perinatal mortality rate of India is estimated to be 26 for the year 2013.<sup>5</sup> Though the magnitude of perinatal deaths in India is known, there is no information about magnitude of preventable perinatal deaths.

It is reasonable to assume that all perinatal deaths are not preventable. Deficiencies in infrastructure to manage high risk antenatal and neonatal cases in backward areas of India has been reported.<sup>6,7</sup> A study of newborn deaths in India has revealed the existence of deficiencies in care practices.<sup>8,9</sup> It is known that in resource poor settings, avoidable / preventable factors contribute to perinatal deaths.<sup>10,11</sup> Therefore, it is evident that some perinatal deaths are preventable. Sustainable Development Goals (SDG) aims to end preventable deaths of newborns and reduce neonatal mortality to at least as low as 12 per 1,000 live births.<sup>12</sup> For India to accomplish this it is essential to identify preventable newborn deaths and pattern of high-risk neonates so that strategies could be devised to reduce it.

Perinatal death auditing would help identify preventable perinatal deaths and risk pattern.<sup>10,11</sup> The inputs from auditing would be useful to frame strategies for prevention of perinatal deaths and planning. As such India does not have a perinatal death auditing system. There is a provision for child death review for reported deaths from hospitals in a District.<sup>13,14</sup> So child deaths that occur in the community are missed. A preliminary survey has revealed that there are problems with documentation and reporting of perinatal deaths from the hospitals.<sup>15</sup> This implies the child death review may not be adequate in identifying all the perinatal deaths that occur from the hospitals apart from missing those that occur in the community. Thus, there is a need for a comprehensive perinatal death auditing system which includes deaths occurring from all the hospitals (government and private) and the community.

A 3-year community based interventional study on perinatal death auditing was carried out in 2 districts of Karnataka State, India. This paper focuses on the utility of expert panel in an audit-based approach to identify preventable perinatal deaths, and risk factors in cases of perinatal deaths are explored.

## METHODOLOGY

**Study Setting:** The two districts chosen were: (1) Dakshina Kannada - an economically, educationally better developed, and with better health care infrastructure; and (2) Koppal - with poorer indices on these parameters.<sup>16,17</sup> This would help to know the utility of the expert panel in better and poor conditions.

**Pre-Interventional Phase:** Survey carried out in both the districts provided information about issues related to the infrastructure, care provided, documentation & reporting of perinatal deaths.<sup>6,15</sup> Due to issues related to documentation and reporting, there was a need to develop specific tools which could be used to gather information from multiple sources. Such tools were developed and the utility of these to identify preventable perinatal deaths along with avoidable / preventable factors have been discussed elsewhere.<sup>18</sup>

**Expert Panel:** The panel consisted of paediatricians, obstetricians from government and private hospitals apart from Reproductive Child Health (RCH) officer of the district. One expert panel was constituted for each district.

**Intervention:** Doctors in both the districts were trained to fill the tools developed for the purpose of gathering information about perinatal deaths.<sup>18</sup> Workshops were conducted for expert panel in both the districts and trained about their role and functions. Expert panel would audit each perinatal death and the findings were communicated to the treating doctors & hospitals.

**Post-intervention Phase:** Surveys carried out at 6 months & at the end of the project helped us to assess the impact the audit. The outcome measures considered and operational definitions relevant for this paper are described below.

**Audit Method:** Expert panel considered the information provided to them from various sources captured in specific tools developed for the purpose.<sup>18</sup> Expert panel met once a month and discussed each perinatal death reported in previous month. They identified the risk factors, avoidable / preventable factors in each case of perinatal death and decided if it was preventable, possibly preventable or not preventable. They discussed various aspects of care provided and suggested remedial measures to prevent perinatal deaths. These were communicated to the hospitals where the perinatal death occurred. If available information was not sufficient, they sought clarifications. Post-interventional surveys helped us to assess the impact. Role and functioning of expert panel along with the overall audit model are depicted in Figure no 1.

**Sources and flow of Information:** As depicted in Figure 1, it included all the hospitals in both the districts the details of which are published elsewhere.<sup>6</sup>

**Information gathering tools:** The development of tools & their utility has been published.<sup>18</sup>

**Operational Definitions:** Perinatal deaths were classified as: 1). Preventable: when data is available and deficiency in care is established, survival chances are good. 2) Possibly Preventable: when survival chances are good and data is not available to prove quality care is given 3) Not Preventable: survival chances are poor, death in spite of quality care and all cases with lethal anomalies. 4). Unclassified perinatal deaths: when data is not available to assess survival chances

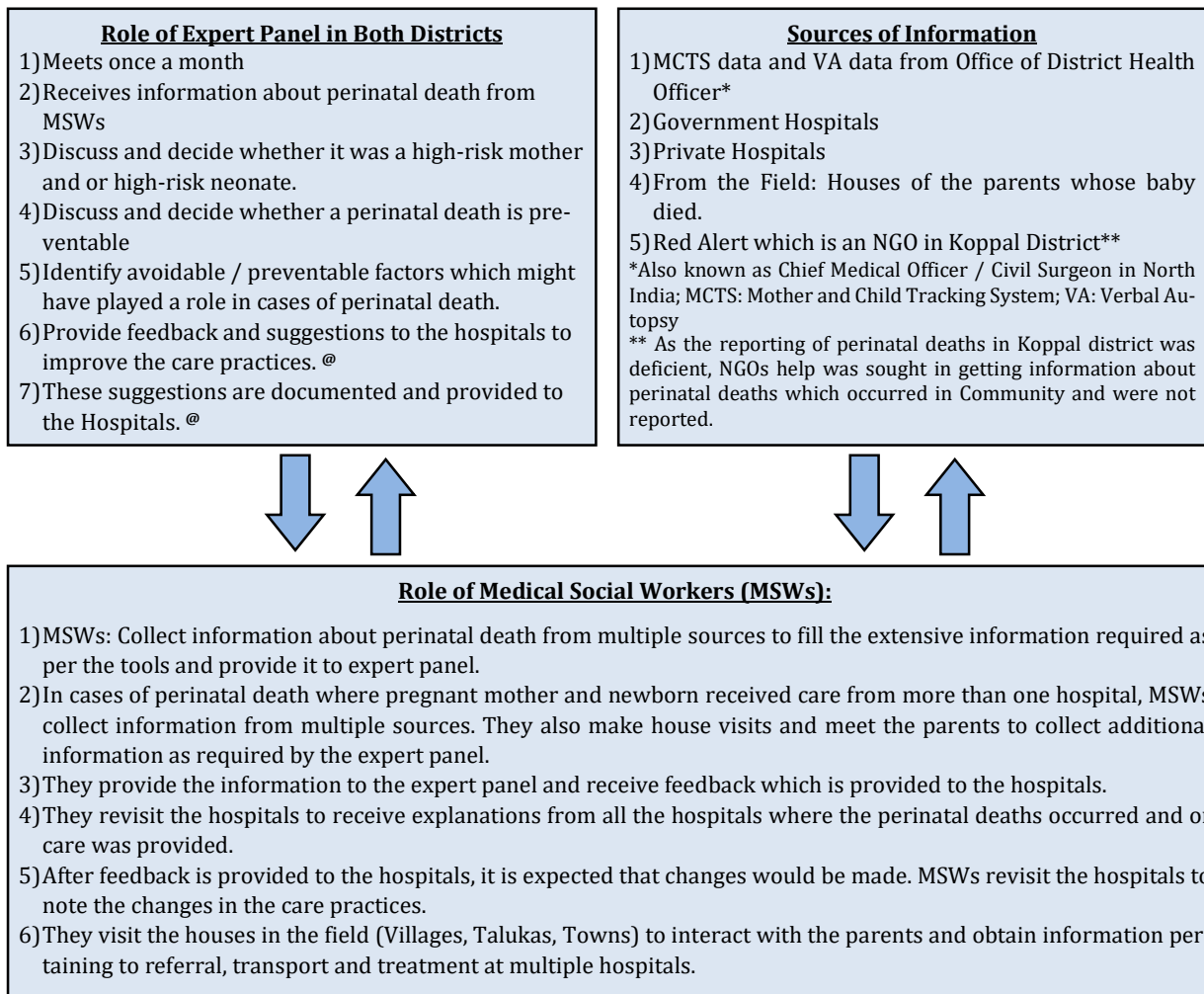
and type of care given. 5). Risk Factors: Based on the information available, risk factors present in a case of perinatal death are identified.

**Outcome measures:** 1). Proportion and types of preventable perinatal deaths. 2). Proportion of risk factors identified.

**Data collection:** Necessary clearances were taken

from the government before beginning of the project. Medical Social workers (MSWs) visited the office of the district health officer in both the districts apart from hospitals (government and private) and community the details of which are depicted in Figure 1.

**Data Analysis:** The results are expressed as proportions in tables. Implications of the results are described and discussed.



# Though information about Maternal and Child Tracking System (MCTS) and Verbal Autopsy (VA) were collected, only data pertaining to perinatal deaths collected from hospitals are analysed considering the objectives of this paper.

@ These roles of expert panel have not been considered in this paper

**Figure 1: Overall Audit Model in each of the two districts#**

## RESULTS

Information about 1070 perinatal deaths were obtained in filled forms with 444 from Dakshina Kannada and 626 from Koppal district. As there was inadequate information about 38 forms in Koppal District they were excluded from analysis. As Expert Committee of Koppal district was reluctant to audit, a second expert committee was formed which analysed the data and is presented in Table No 1. Overall, the proportion of identified Preventable and possibly preventable perinatal deaths in Dakshina Kannada (35.4%, 30.2%) was lower than Koppal District (60%, 20%) (Table 1). The proportion of Preventable

Intranatal deaths was highest for Koppal (79%) followed by Neonatal (66%) and Antenatal foetal deaths (53%). For Dakshina Kannada district, Preventable Antenatal foetal Deaths (48%) and Intranatal deaths (47%) were higher than neonatal deaths (19%) (Table 1).

Anaemia (50.9%), Foetal Distress (16.7%) and Pre-term (57.1%) were the most common antenatal, intranatal and neonatal risks identified (Table 2). The magnitude of identified antenatal risk factors for Koppal District was better than Dakshina Kannada District. Magnitude of identified intranatal and neonatal risk factors for Dakshina Kannada was much higher

than Koppal District.

**Table 1: Preventability identification by expert panel in both the districts**

Perinatal Deaths	Expert Panel at Dakshina Kannada District [n=444] (%)	Second Expert Paenl at Koppal District [n=626] (%)*
<b>All Perinatal Deaths</b>		
Not preventable	121 (27.3)	32 (5)
Possibly preventable	134 (30.2)	124 (20)
Preventable	157 (35.4)	377 (60)
Unclassified	32 (7.2)	93 (15)
<b>Antenatal Foetal Deaths</b>		
Not preventable	41 (19)	24 (7)
Possibly preventable	55 (25)	80 (24)
Preventable	106 (48)	176 (53)
Unclassified	18 (8)	51 (16)
<b>Intranatal Foetal Deaths</b>		
Not preventable	3 (10)	1 (2)
Possibly preventable	9 (30)	7 (12)
Preventable	14 (47)	45 (79)
Unclassified	4 (13)	4 (7)
<b>Neonatal Deaths</b>		
Not preventable	77 (40)	7 (3)
Possibly preventable	70 (36)	37 (16)
Preventable	37 (19)	156 (66)
Unclassified	10 (5)	38 (16)

\*Second expert committee was constituted at Koppal the reasons for which are explained in the article

**Table 2: Risk Identification by expert panel in both the districts**

Types of Risks identified	Expert Panel at Dakshina Kannada District	Expert Panel at Koppal District	Total
<b>Antenatal Risks</b>	<b>(n = 444) (%)</b>	<b>(n = 588) (%)*</b>	<b>(N = 1032) (%)</b>
1. Anaemia	134 (30.1)	391 (66.4)	525 (50.9)
2. PIH**	138 (31)	82 (13.9)	220 (21.3)
3. Age (< 20 + > 35 yrs)	60 (13.5)	133 (22.6)	193 (18.7)
4. Oligohydramnios / Foetal Hypoxia	87(19.5)	3 (0.5)	90 (8.7)
5. Malnutirtion (Mother <50kgs)	73 (14.4)	15 (3.5)	88 (8.5)
6. Abruption	69 (15.5)	11 (1.8)	80 (7.7)
7. Decreased Foetal Movements	58 (13)	3 (0.5)	61 (5.9)
8. Gestational Diabetes	24 (5.4)	5 (0.8)	29 (2.8)
9. Gravidity ≥ 5	9 (2)	20 (3.4)	29 (2.8)
10. Placental Insufficiency	18 (4)	11 (0.1)	19 (1.8)
11. Rh Incompatibility	7 (1.5)	---	7 (0.6)
<b>Types of Intranatal Neonatal Risks identified</b>	<b>(n = 220) (%)</b>	<b>(n = 264) (%)*</b>	<b>(N = 488) (%)</b>
1. Foetal Distress (<120 FHR >160) #	152 (69)	21 (7.9)	173 (35.4)
2. Emergency C-Section	62 (27.9)	2 (0.7)	64 (13.1)
3. Meconium-Stained Amniotic Fluid	10 (4.5)	17 (6.4)	27 (5.5)
4. Cord Prolapse	5 (2.2)	2 (0.7)	7 (1.4)
5. Premature Rupture of Membrane	5 (2.2)	2 (0.7)	7 (1.4)
6. Prolonged / Obstructed Labour	2 (0.9)	1 (0.3)	3 (0.6)
<b>Types of Neonatal Risks identified</b>	<b>(n = 194) (%)</b>	<b>(n = 210) (%)*</b>	<b>(N = 404) (%)</b>
1. Preterm	134 (69)	97 (46.1)	231 (57.1)
2. Birth Asphyxia/Foetal Distress/Low APGAR Score	105 (54.1)	92 (43.8)	197 (48.7)
3. Congenital Anomaly	40 (20.61)	1(0.4)	41 (10.1)
4. Term Low Birth Weight	60 (30.9)	28 (13.3)	88 (21.7)
5. Respiratory Distress Syndrome	77 (36.6)	5 (2.4)	82 (20.3)
6. Sepsis / Meningitis / Pneumonia	59 (30.4)	1 (0.5)	60 (14.8)
7. Bleeding / Clotting Disorder	38 (19.8)	---	38 (9.4)
8. Shock /Circulatory Failure	24 (12.3)	1 (0.5)	25 (6.1)
9. Hypoxic Ischemic Encephalopathy	22 (11.3)	4 (1.9)	26 (6.4)
10. Meconium Aspiration Syndrome	12 (6.1)	5 (2.3)	17(4.2)
11. Genetic Disorders	13 (6.7)	---	13 (3.2)
12. Others@	17 (8.7)	---	17 (4.2)

\*At Koppal there were 626 cases. But 38 cases are not included in analysis as there was no data available. The findings are by the second expert committee the reasons for which are explained in the article.

\*\*PIH: Pregnancy Induced Hypertension;

FHR = Foetal Heart Rate;

@ (n) = Includes Seizures (4), Hypoglycemia (2), Persistent Pulmonary Hypertension (3), Neonatal Hyperbilirubinemia (2), Hypothermia (1), Electrolyte abnormality (1), Renal Failure (4)

## DISCUSSION

Expert panel-based approach was able to identify preventable perinatal deaths. Perinatal death auditing based on the concept of an expert panel is not new.<sup>19-29</sup> Such expert panel-based audit approach is useful to identify preventable deaths.<sup>19-29</sup> So, the results obtained here is in line with other studies.<sup>19-29</sup> But most of these studies are limited to a single institution / hospital in contrast to our approach which captured information from all the hospitals (government and private) as well as community. This is useful to overcome inadequate reporting and documentation of perinatal deaths, a known problem in India.<sup>15</sup> So a community-based approach is suitable to get realistic estimates apart from providing useful information to frame strategies for prevention

The magnitude of preventable deaths is higher for Koppal District as compared with Dakshina Kannada Districts. Economically strong and developed areas with better health care facilities like Dakshina Kannada district are expected to have capability for providing quality care for high-risk cases as compared with Koppal District.<sup>14-17</sup> So the magnitude of perinatal deaths and preventable perinatal deaths are lower in Dakshina Kannada as compared to Koppal District (Table 1). Koppal District has higher proportion of Preventable intranatal and neonatal deaths as compared with Dakshina Kannada district due to lack of facilities for quality care in high-risk cases (Table 1).<sup>17</sup>

Preliminary studies in Koppal District have found problems with documentation and reporting apart from lacuna in capability to provide quality care.<sup>15-18</sup> This is reflected in higher proportion of Unclassified deaths in Koppal district as compared to Dakshina Kannada District (Table 1). Lack of information compelled the expert panel to label them as Unclassified deaths (Table 1). Proper documentation of medical case records in hospitals and prompt reporting is an essential prerequisite for successful auditing of perinatal deaths.<sup>15</sup> Poor documentation and reporting would limit the utility of audit-based approach.

The pattern of risk identified by the expert panel has implications for improving quality of care. Antenatal risk pattern (Like Anaemia, PIH, Malnutrition, Age < 20 yrs) (Table 2) implies that Maternal and Child Tracking System established by Government of India needs improvement.<sup>30</sup> Pattern of intranatal and neonatal risk (like foetal distress, Emergency C-Section, Preterm, Birth Asphyxia, Low birth weight, Mecconium-stained amniotic fluid) are in line deficiencies in facilities and highlights the need for improvements in infrastructure and care.<sup>6</sup>

Apart from limitations related to documentation of medical case records, this study uncovers one more related to working of the expert panel. The expert panel in Koppal District was reluctant to audit perinatal deaths as those cases might have been managed by

their professional colleagues, necessitating a second committee. This was more open to the concept of auditing (Table 1). If members of expert panel are not favourable to the concept of auditing, then this approach would not serve to identify preventable perinatal deaths, risks and avoidable / preventable factors limiting the utility. A community-based audit approach requires lot of time and effort to collect and compile information about all the perinatal deaths in a district. This problem is precipitated by lack of proper documentation and reporting systems.

## CONCLUSION

If the members of expert panel are favourable to the concept of auditing, then this approach is useful to identify preventable perinatal deaths. Pattern of risk identified has implications for improvements in quality of care.

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