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Implementation and coverage of treatment and prevention interventions for diarrhoeal diseases in Karnataka State: A data based study

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Abstract
Background: Children are the backbone of future nation. Among the causes for under-5 mortality and infant mortality if we exclude neonatal mortality, then diarrhoeal diseases form the second most leading cause of both infant & under- 5 mortality following pneumonia in developing countries. In India, during 2014, about 11.6 million cases with 1,323 deaths were reported in India. In Karnataka about 18-20% of under-5 deaths occur due to diarrhea. This is both preventable and treatable.
Methods: This is an evaluation of data available from various sources like SRS, UNICEF data, DLHS and HMIS reports. The indicators which were studied are Impact indicators, Diarrhoeal prevention indicators and Diarrhoeal treatment indicators.
Results: The Infant Mortality Rate observed over the years shows a declining trend. Most of the indicators like improvement in the drinking water sources, measles vaccination and population utilizing ORS treatment show an increase. It is seen that the Exclusive breastfeeding shows a decreased coverage. There is no marked increase in treatment seeking for diarrhoeal diseases. Awareness of diarrhoea is decreased from 88.4 to 74.6%. Zinc use also can be scaled up as its coverage was <50%.
Conclusion: The interventions for diarrhoeal control, both treatment and preventive are effectively done at the level of home, community and as an outreach., There is a rational mix of community & facility based measures. Lack of awareness perpetuates the need to develop more effective ways for creating awareness.

Keywords: Indicators, Districts, ORS, Exclusive Breastfeeding

Introduction

Children are the backbone of future nation. It is the duty of each and every country to protect its own children., Millennium Development Goal number 4 Target 5 was to reduce under-5 mortality rate by two-thirds, between 1990-2015. In India in 2012 the under-5 mortality rate was 52deaths/1000 live births, with target of 42/ 1000 live births by 2015 and it was only likely to achieve 49/1000,births. Infant Mortality rate in India was 40/1000 live births in 2013, with target of 27/ 1000 live births by 2015 and likely to achieve 38/1000 live births. [1]
In state of Karnataka although the national target for under-5 mortality rate of 42 has been achieved with 37/ 1000 live births in 2012, further reduction has been very slow. Whereas when it comes to infant mortality rate in Karnataka, it is yet to achieve the national goal of 27 and it had IMR of,31/ 1000 live births in 2013 [2]. According to Sample Registration System data source, the Infant Mortality rate in Karnataka was 29, 28 and 24 /1000 live births in in 2014,15 and 16 consecutively [3-5]
Among the causes for under-5 mortality and infant mortality if we exclude neonatal mortality, then diarrhoeal diseases form the second most leading cause of both infant & under- 5 mortality following pneumonia in developing countries. Even though there has been a gradual reduction in deaths of children, proportional mortality accounted by diarrhoeal diseases still remains high i.e 13%, killing 300,000 children in India each year [6].In India, during 2014, about 11.6 million cases with 1,323 deaths were, reported in India [7]. In Karnataka about 18-20% of under-5 deaths occur due to diarrhea [8]. This is both preventable and treatable.
In 1978, Diarrheal Disease Control Programme (DDCP) was launched in India. In 1985-86, strengthening the case management of diarrhea among children was the main goal and National Oral Rehydration Therapy (ORT) Programme was introduced. Subsequently,

DDCP and ARI control programme (initiated in 1989-90) became part of Child Survival and Safe Motherhood Programme in 1992 and Reproductive and Child Health (RCH) Programme in 1997. WHO/UNICEF proposed Integrated Management of Childhood illnesses (IMCI) in 2005 in RCH-2. Due to very high neonatal mortality, India has further amended this strategy by including management of neonatal illnesses and the strategy was renamed as Integrated Management of Neonatal and Childhood Illness (IMNCI). The IMNCI programme was introduced in India in the year 2005, under National Rural Health Missiom [9]. By June 2010, it had been implemented in 223 of India's 640 districts and more than 200 000 workers had been trained.

In Karnataka the IMNCI implementation was initiated on a pilot basis in Raichur district during 2005-06. It was extended to the districts of Bidar, Gulbarga, Bellary, Gadag, Bijapur, Koppal and Chamarajangara during 2007-08. It was further extended to Belgaum, Uttara Kannada, Bagalkote, Haveri and Gadag in 2009-10 thus covering 14 districts – i.e. all the districts of Belgaum and Gulbarga division and the tribal district of Kodagu and Chamarajnagara. The programme has been extended to cover all districts in 2011-12., The programme is being implemented in all 30 Districts from, 2012-13 [10].

There is limited information and evidence regarding the implementation and coverage of treatment and prevention interventions in control of diarrhoeal disease and deaths related to it in state of Karnataka. Such information is critical to guide the further implementation of the programme and to modify the course. This paper summarizes the current status of its implementation and coverage.

Objectives

1. To Monitor the Implementation and coverage of, treatment and Prevention interventions of Diarrhoeal, diseases in various districts of Karnataka state
2. To study the trend of under-5 children mortality & infant mortality in Karnataka
3. To identify the high focus districts based on indicators

Methodology

This is an evaluation of data available from various sources like SRS, UNICEF data, DLHS and HMIS reports. The indicators which were studied are Impact indicators, Diarrhoeal prevention indicators and Diarrhoeal treatment indicators [11] (Table 1). All these Indicators were studied from various sources and compared with previous years available data. Indicators have been studied before, during and after implementation of IMNCI Programme in the State. Based on comparisons the districts requiring high focus were identified.

Table 1: List of Impact indicators and Coverage indicators.

Impact Indicators		1. Infant mortality rate 2.Under5 mortality rate
Diarrhoeal Prevention Indicators		
SL NO	**Intervention**	**Indicator**
1	Improved Drinking water sources	Percentage of population using improved drinking water sources
2	Improved Sanitation Facilities	Percentage of population using improved sanitation facilities
3	Immunization against Measles	Percentage of one year old immunized against measles
4	Exclusive breastfeeding	Proportion of children >6 months old Exclusive breastfed
Diarrhoeal Treatment Indicators		
1	ORS for diarrhoea	Proportion of children 0-59 m old who had diarrhoea in past 2 weeks & were treated with ORT
2	Use of Zinc for diarrhoea	Proportion of children 2-59 m old who had diarrhoea in past 2 weeks & were treated with an appropriate course of Zinc
3	Treatment sought	Proportion of children 0-59 m old who had diarrhoea in past 2 weeks & sought advice / treatment
4	Awareness about diarrhoea	Percentage of women who are aware of diarrhoea management.

Results and Discussion

Table 2 shows the comparison of Impact Indicators in the Karnataka state with that of National averages. The overall performance of the State in term of these indicators looks better than the National average. Figure 1 shows the trend of Infant Mortality Rate over the years obtained from SRS data. It shows a declining trend over the years.

The impact indicators Infant Mortality Rate and Under-Five Mortality rate has gradually decreased over the years but the target to be achieved by 2017 according to State Programme Implementation Plan [12], is IMR 20 and U5 MR of 22 which seems less likely to be achieved. The cause of such gradual decrease, is the discrepancy in the coverage of diarrhoeal disease prevention and treatment interventions in various districts of Karnataka. There appears a huge variability, between high and the low performing districts.

Table 2: Comparison of Impact Indicators in the Karnataka state with that of National averages

Indicators	**Karnataka**	**Data of INDIA**
Infant Mortality Rate (2016) (SRS)[5]	24	34
Under-5 Mortality Rate (2012) (UNICEF)	37	52

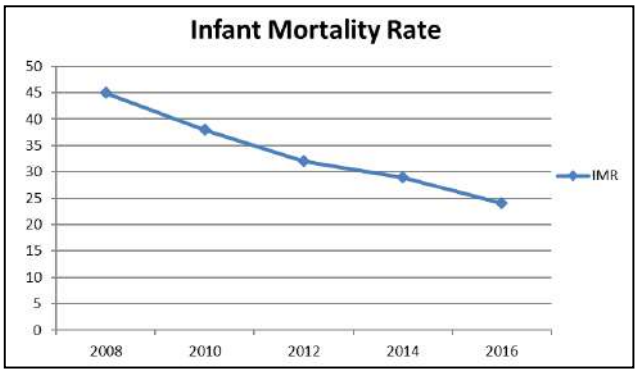

Fig 1: Comparison of Infant Mortality Rate in the state over the Years (SRS)

There are various treatment and prevention interventions for control of diarrhoeal diseases and deaths related to it like improved sanitation, provision of improved drinking water supply, Oral Rehydration Therapy, Zinc supplementation, Exclusive Breastfeeding etc. Table 3 shows the indicator values of the prevention and treatment interventions for diarrhoeal diseases in Karnataka state which is obtained from both DLHS and NFHS data. There is no significant difference in the data derived from different sources. All the indicators show an increase in the value like for example improvement in the drinking water sources, increase in measles vaccination, or increase in the population utilizing ORS treatment during diarrhoeal episodes.

It is seen that the Exclusive breastfeeding shows a decreased coverage from DLHS 3 to DLHS 4 or NFHS3 to NFHS 4. There is no marked increase noticed in treatment seeking for diarrhoeal diseases. And also awareness of diarrhoea is decreased from 88.4 to 74.6% in duration of 5 years which shows the negligence in the Information, Education and Communication component.

Zinc use also can be scaled up as its coverage was <50%.

Table 3: Coverage of Diarrhoeal Prevention Indicators and treatment indicators in Karnataka

Interventions	2007-08 DLHS-3 [13]	2012-13 DLHS-4 [14]	2005-06 NFHS -3[15]	2015-16 NFHS-4 [16]
Diarrhoeal Prevention Indicators				
Improved Drinking water sources	85.9%	92.3%	86.1%	89.3%
Improved Sanitation Facilities	32.4%	51.3%	33.5%	57.8%
Immunization against Measles	85.2%	89.6%	72%	82.4%
Exclusive breastfeeding	38.3%	25.7%	58.6%	54.2%
Diarrhoeal Treatment Indicators				
ORS for diarrhoea	46.1	56	31.9%	52.8%
Use of Zinc for diarrhoea	-	47.1	-----	34.3%
Treatment sought	76.6	77	67.2%	69.7%
Awareness about diarrhoea among mothers	88.4	74.6	----------	------

Through comparison of district wise data with that of state level data (Table 4) from DLHS, those districts which had less indicator value than state average were selected. Udupi, Uttar Kannada and Kodagu districts showed lesser access to improved drinking water. All these areas are in the hilly areas and either river or wells are the main source of drinking water.

The North – Karnataka districts Bijapur, Koppal and Gulbarga showed very poor sanitation facility. Immunization against Measles was almost above 85% in most of districts except Bijapur, Raichur and Bagalkot districts.

Diarrhoeal treatment indicators were also low in North-Karnataka districts like Bidar, Bellary and Belgaum. On the whole it was observed that the Northern districts like Gulbarga, Raichur, Belgaum, Bellary, Bijapur, Bidar, Koppal and Bagalkot showed poor performance in most of the indicators.

Through the DLHS source, it was found that the North Karnataka districts, i.e Bellary, Gulbarga, Belgaum were requiring high focus as coverage of treatment and prevention interventions for diarrhoea were least here (Table 5).These districts were identified as high focus areas because IMR and U5MR were still above the state average.

According to report of PIP monitoring for Bellary district 2013 [12], although mortality information for the district comes from HMIS data and as such is not strictly comparable with the SRS figures of the state, IMR of the district estimated from HMIS is significantly lower than the SRS estimate for the state. However, the census estimate of IMR based on 2001 census was 76 for Bellary district against the state average of 54. The IMR in Bellary was not only highest among the districts of Karnataka but also it was considered as one of districts with very high IMR in the country.

Table 4: Districts with least performance in each indicator

Interventions	2007-08 DLHS-3 [13]	2007-08 DLHS-3 [13]		
Diarrhoeal Prevention Indicators				
Improved Drinking water sources	85.9%	Udupi 37.5%	Uttar Kannada 49.8%	Kodagu 60.4%
Improved Sanitation Facilities	32.4%	Bijapur 9.3%	Gulbarga 13.5%	Koppal 13.6%
Immunization against Measles	85.2%	Bijapur 67.4%	Raichur 70%	Bagalkot 71.2%
Diarrhoeal Treatment Indicators				
ORS for diarrhoea	46.1	Belgaum 34.5%	Bellary 46.4%	
Treatment sought	76.6	Bidar 49.8%	Uttar kannada 56.5%	Belgaum 57.1%

Table 5: Geographic areas/ population groups requiring high focus (North Karnataka districts i.e Bellary, Gulbarga, Belgaum)

	Bellary		Gulbarga		Belgaum	
	DLHS-3	DLHS-4	DLHS-3	DLHS-4	DLHS-3	DLHS-4
ORS use	46.4	59.3	69.2	61.6	34.5%	40.6
Zinc use	_____	25.9	_____	58	_____	36.5
Treatment sought	60.6	73.1	84	85.1	57.1%	81
Awareness among mothers	85.8	62.9	96.5	70.3	61.5	46.7
Exclusive breastfeeding	30.1	21	24.8	31.3	49.8	41

Conclusion

The interventions for diarrhoeal control, both treatment and preventive are effectively done at the level of home, community and as an outreach. The Programmes like IMNCI, WASH (water, Sanitation and Hygiene) programme in schools by UNICEF, Integrated Global Action Plan to Prevent and Control Pneumonia and Diarrhoea by WHO/ UNICEF, Intensified Diarrhoea Control Fortnight and many others all thrive to end preventable deaths due to diarrhoea.

There is a rational mix of community & facility based intervention and it focuses on enhancing skill of the health care personnel. There are standard treatment guidelines given through IMNCI programme for improving the case management skills and also training in home based care. But there seems to be poor awareness about diarrhoeal disease danger signs and exclusive breastfeeding among the population. The limitations of this study are that it is a data based study and discrepancies in the different sources of data.

Recommendations

1. Lack of awareness perpetuates the need to develop more effective ways for creating awareness.
2. There needs to be a well-equipped referral system
3. Involvement of private sector.
4. Quality tool for monitoring of interventions and regular monitoring.

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