

# Neonatal basic care

Authors: Kaur G, Ahmed S, Ellertsen C, Watkins D, Coates MM, Økland JM, Haaland ØA, Johansson KA

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## Description of condition and intervention

Neonatal care is an important tenet to ensure that every baby survives and thrives to reach their full potential for growth and development. Providing timely care to new-born immediately after birth and during postnatal period is critical. Global estimates indicate that new-born deaths account for 47% of deaths among children under the age of five globally, resulting in 2.4 million lives lost each year. About one third of new-born deaths occur on the day of birth and close to three quarters occur within the first week of life. Children who die within the first 28 days of birth suffer from conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth and in the first days of life. Most new-born deaths take place in low and middle-income countries. Highest neonatal mortality of 27 per 1,000 live births has been reported in Sub-Saharan Africa. (Source: WHO 2021).

Specific health interventions are included as part of neonatal basic care to address the neonatal morbidity and mortality, especially relevant in resource-constrained settings. We include the below-mentioned interventions as part of neonatal basic care to assess their effects and costs, being analysed in FairChoices: DCP Analytical tool.

*Basic neonatal resuscitation care (with bag and mask)*

*Thermal protection for all babies, especially preterms*

*Treatment of local infections (eye, skin)*

*Hygienic cord care (chlorhexidine and tetracycline ointment)*

*Kangaroo mother care*

## International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
World Health Organization 2017	<a href="#">WHO recommendations on newborn health</a>	Yes

## Intervention attributes

### Type of interventions & Delivery platform

Table 1: Type of interventions &amp; delivery platform

Intervention	Type	Delivery platform
Basic neonatal resuscitation care (with bag and mask)	Curative	Health centre
Thermal protection for all babies, especially preterms	Promotion	Health centre
Treatment of local infections (eye, skin)	Curative	Health centre
Hygienic cord care (chlorhexidine and tetracycline ointment)	Prevention	Health centre
Kangaroo mother care	Promotion	Health centre

## Equity

In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe

disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

## Time dependence

Moderate level of urgency. Treatment outcomes not highly affected by some days of delay.

## Population in need of interventions

Table 2: Population in need of interventions

Intervention	Treated population		Affected population		Disease state addressed
	Treated age	Treated fraction	Affected age	Affected fraction	
1. Basic neonatal resuscitation care (with bag and mask)	neonates both genders; incidence based	0.1	neonates	1 (Appendix Guttmacher report 2014)	Neonatal resuscitation
2. Thermal protection for all babies, especially preterms	neonates both genders; incidence based	1	neonates	1 (Appendix Guttmacher report 2014)	Neonatal preterm birth
3. Treatment of local infections (eye, skin)	neonates both genders; birth based		neonates		
4. Hygienic cord care (chlorhexidine and tetracycline ointment)	neonates both genders; birth based	1	neonates	1 (Appendix Guttmacher report 2014)	Neonatal sepsis and other neonatal infections
5. Kangaroo mother care	neonates; both genders; incidence based	1	neonates	0.58 (Appendix Guttmacher report 2014)	Neonatal preterm birth

## Intervention effect and safety

Table 3: Effect and safety of interventions for neonatal basic care

Effect of intervention		Certainty of evidence
Mortality		
Basic neonatal resuscitation care (with bag and mask)	0.3 reduction in neonatal mortality with emergency care (Table 40, Appendix Guttmacher report 2014)	See appendix
Thermal protection for all babies, especially preterms	0.2 reduction in neonatal mortality with thermal care due to preterm birth (Table 40, Appendix Guttmacher report 2014)	
Hygienic cord care (chlorhexidine and tetracycline ointment)	0.27 reduction in neonatal mortality due to infected umbilical cord with clean birth practices and chlorhexidine (Table 40, Appendix Guttmacher report 2014)	
Kangaroo mother care	0.51 reduction in neonatal mortality due to preterm birth with kangaroo care and full supportive care (Table 40, Appendix Guttmacher report 2014)	

## Model assumptions

Table 4: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Category	Model parameter	Notes
Interventions	Basic neonatal resuscitation care (with bag and mask)  Thermal protection for all babies, especially preterms	

	Treatment of local infections (eye, skin)	
	Hygienic cord care (chlorhexidine and tetracycline ointment)	
	Kangaroo mother care	
Cost parameters		
Treated population	See Table 2	Global Burden of Disease Study 2019
Gender		
Age		
Treated fraction		
Effect parameters		
Affected population	Those with condition	
Affected gender	See Table 2	
Affected fraction age		
Affected fraction		
Comparison	No intervention	
Mortality Reduction (RRR)	See table 3	
Basic neonatal resuscitation care (with bag and mask)	0.3	
Thermal protection for all babies, especially preterms	0.2	
Hygienic cord care (chlorhexidine and tetracycline ointment)	0.27	
Kangaroo mother care	0.51	

## Intervention cost

The cost for basic neonatal resuscitation care (with bag and mask) is estimated to be 0.55 USD per affected live birth in 2012 in Low-income countries (LIC) (Guttmacher report 2014).

The cost for thermal protection for all babies, especially preterms, is estimated to be 8.38 BDT in Bangladesh, reflecting the cost for counselling of mothers on providing thermal care for preterm new-borns. The estimate is calculated based on the average cost for counselling of mothers during pregnancy detection (3.08 BDT), during pregnancy confirmation (3.11 BDT), and during delivery care (18.96 BDT) (Sarker, Ahmed, Islam, Khan 2013).

The cost for treating local infections (eye, skin) is estimated to be 0.68 USD per average case in 2014 in LIC (Guttmacher report 2014).

The cost for hygienic cord care (chlorhexidine and tetracycline ointment) is estimated at 30 BDT per live birth in Bangladesh in 2010. The cost is calculated as the average cost of popular locally available allopathic products for umbilical cord care (Coffey, Metzler, Islam, Koehlmoos 2013).

The cost for Kangaroo mother care is estimated to be 3.63 USD per live birth in 2012 in Nicaragua, reflecting the cost for counselling of mothers on providing kangaroo care for new-borns.

## References

WHO 2021: World Health Organization. Newborn health. Available from: [https://www.who.int/health-topics/newborn-health#tab=tab\\_1](https://www.who.int/health-topics/newborn-health#tab=tab_1) (accessed on 6 dec 2021)

WHO recommendations on newborn health: guidelines approved by the WHO Guidelines Review Committee. Geneva: World Health Organization; 2017 (WHO/MCA/17.07)

Johansson KA et al 2020: Johansson KA, Coates MM, Økland JM, Tsuchiya A, Bukhman G, Norheim OF, Haaland Ø. Health by disease categories. Distributional Cost-Effectiveness Analysis: Quantifying Health Equity Impacts and Trade-Offs. 2020 Sep 30:105.

Table 40, Appendix Guttmacher report 2014: Darroch JE, Sully E, Biddlecom A. Adding it up: investing in contraception and maternal and newborn health, 2017—supplementary tables. New York, NY: The Guttmacher Institute. 2017

OneHealth Tool: OneHealth Tool. Geneva: World Health Organization; 2021. Available from <https://www.who.int/tools/onehealth> (accessed on 25-October-2021) One Health Tool

Guttmacher report 2014: Darroch JE, Sully E, Biddlecom A. Adding it up: investing in contraception and maternal and newborn health, 2017—supplementary tables. New York, NY: The Guttmacher Institute. 2017

Sarker, Ahmed, Islam, Khan 2013: Sarker BK, Ahmed S, Islam N, Khan JA. Cost of behavior change communication channels of Manoshi -a maternal, neonatal and child health (MNCH) program in urban slums of Dhaka, Bangladesh. Cost Eff Resour Alloc. 2013 Nov 14;11(1):28. doi: 10.1186/1478-7547-11-28. PMID: 24228844; PMCID: PMC3831249.

Coffey, Metzler, Islam, Koehlmoos 2013: Coffey PS, Metzler M, Islam Z, Koehlmoos TP. Willingness to pay for a 4% chlorhexidine (7.1% chlorhexidine digluconate) product for umbilical cord care in rural Bangladesh: a contingency valuation study. BMC Int Health Hum Rights. 2013 Oct 18;13:44. doi: 10.1186/1472-698X-13-44. PMID: 24139384; PMCID: PMC4016526.

## Appendix

### Literature Review for effectiveness & safety

This literature search is an example of Level 1 search for intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, meta-analysis, systematic review, clinical practice guidelines)