

ADDRESSING MATERNAL AND CHILD HEALTH IN MALI

A POLICY BRIEF

Executive Summary

Mali's high maternal, neonatal, and under-age 5 mortality rates are meeting one of the world's highest birth rates. This poses a significant challenge that requires targeted interventions. Evidence-based recommendations have been developed from **25 systematic reviews**. For **I. maternal health**, interventions include providing high-quality antenatal care (ANC), educating mothers and communities, and preparing for complication readiness. To improve **II. neonatal health**, accessible contraception, youth-friendly ANC, and female education and empowerment are recommended. Additionally, cost-free sepsis screening during pregnancy, clean delivery practices, and scaling up obstetric care can counter communicable diseases. For **III. child health**, interventions include improving immunization coverage, promoting exclusive breastfeeding, and reducing air pollution and improving WaSH access while considering care-seeking patterns. These efforts aim to reduce mortality rates, achieve the Sustainable Development Goals, and build resilience to address future challenges such as pandemics and climate change, and, first and foremost, work towards equality between sexes through improving the health situation for women and their babies. With a rapidly growing and young population, the **future and development of Mali lies in the hands of its children and women.**



Where do we stand — An introduction to Mali's current situation

"Traditionally, a woman in labor is compared to a soldier on the front line. When she has delivered, she is considered victorious, but if she dies in labor, it is said of her that she died honorably on the battlefield." (Mali Health, n.d.)

– Amadou Hampâté Bâ

Mali is located in Sub-Saharan Africa (SSA) and is the biggest landlocked country in West Africa, with one of the fastest-growing populations in the world. Currently, Mali counts ~ 23,3 million inhabitants, of which 90% reside in the southern regions. The country's health system faces severe challenges, threatening the health and well-being of its citizens, especially women. Notably, the young (two-thirds < 25 years) and fast-growing population challenge the already poor healthcare system. (The World Bank, 2022b).

With an annual GDP per capita of \$879 in 2020, Mali is classified as a Low-Income Country (LIC) by the World Bank, further ranking low on the Human Development Index (186 of 191) (HDR, 2022). Currently, ~ only **3.89% share of the GDP** is spent on the **healthcare system** (The World Bank, 2022a). The public health system is organized in a **pyramid structure**, with **decentralized governance** of the **community health centers** and the **referral health centers/district hospitals** (Severe Malaria Observatory, 2022).

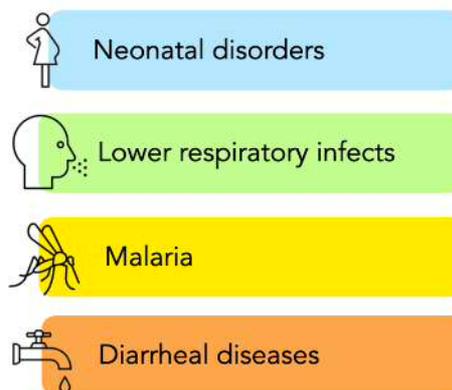
For several years, Mali's political situation has been unstable and debilitated by coups and crises. This has severe implications for the country's health system, both in terms of the availability and quality of health services. As health facilities were damaged and destroyed, it is difficult for health workers to provide adequate care (Ataullahjan, 2020).



Healthcare Metrics (Unicef, 2022)

- **Physicians** per 1,000 people: 0.1
- **Composite Coverage Index CCI**: 49%
- **Fertility** rate (births per woman): 5.9
- Mortality trend, deaths per 1,000 live births, **under-5 age (UN5)**: 97
- Lifetime risk of maternal death (1 in n): 29
- **Infant** mortality rate (deaths per 1,000 live births): 62
- **Neonatal** mortality rate (deaths per 1,000 live births): 33
- Percentage of girls and women (aged 15-49 years) who have undergone female genital mutilation (**FGM**) (%): 89

The Global Burden of Disease Project (GBD, 2022) identifies that most deaths and disabilities (DALYs) in Mali are caused by:



These health risks are exacerbated by three key factors:

- *Malnutrition*
- *Poor water, sanitation, and hygiene (WaSH)*
- *Air pollution*

Most alarming are the resulting high **maternal and neonatal mortality rates, which count toward the highest rates worldwide** (ISS Africa, 2022).

This policy brief aims to provide evidence-based policy recommendations to improve Mali's **maternal, neonatal, and child health**.

The **CCI** is the weighted average of the percentage coverage of eight interventions along four stages of the continuum of care: reproductive care; maternal care; childhood immunization; and management of childhood illness (Unicef, 2022).



Gaining empirical evidence — A quick methodological insight

The data included in the policy brief almost exclusively stem from systematic reviews to reduce bias from single studies. Furthermore, reviews that included **Randomized Control Trials** (RCT) were prioritized. Non-systematic reviews were included when they provided relevant evidence from Mali.

In RCTs, participants are randomly assigned to either a treatment group or a control group. The aim is to determine the effectiveness of a particular intervention. These studies are widely considered as the gold standard of research data (Hariton et al., 2018).

The identified risk factors to maternal, neonatal, and child health, as well as the proposed policy recommendations, are based on evidence from **25** systematic reviews. These cover evidence from 707 studies. Various electronic databases were searched: PubMed, Google Scholar, Cochrane, and Scopus.

***Preeclampsia** and **eclampsia** are pregnancy-related high blood pressure (HBP) disorders. In preeclampsia, the mother's HBP reduces the blood supply to the fetus, which may get less oxygen and fewer nutrients. Eclampsia is when pregnant women with preeclampsia develop seizures or coma (NIH, 2017).*

I. Maternal Health

A. Risk factors: Postpartum Hemorrhage, Hypertension & Sepsis

In Mali, the situation for mothers and pregnant women remains critical. With one of the highest birth rates worldwide, the persisting high mortality rates during childbirth endanger women. While improvements have been made over the past decades, UNICEF still reports a lifetime risk of maternal death for 1 in 29 women (2022). This clearly demonstrates the need for improvement. Major risk factors are:

- **POSTPARTUM HEMORRHAGE:** excessive bleeding after birth, which can lead to death.
- **HYPERTENSION**
- **SEPSIS**

All of these medical conditions can lead to **serious pregnancy complications** and **adverse pregnancy outcomes**, such as **preterm birth, low birth weight, stillbirth, and neonatal death**.

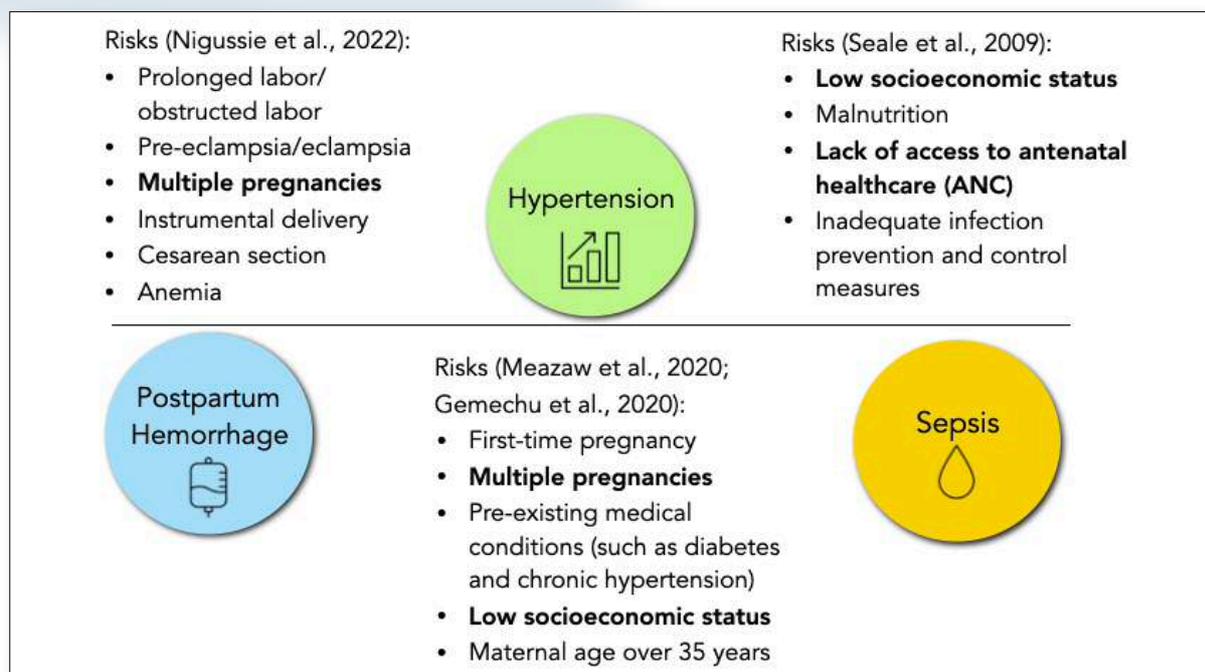


Fig. 1: Pooled Risk Factors for Maternal Health. Own Illustration.

B. Toward Evidence-Based Action: The Fruitful Interplay of Antenatal care (ANC), Education & Complication Readiness.



TAKEAWAY

Increasing access to high-quality ANC services and supporting women to attend at least four ANC visits during their pregnancy is crucial for improving maternal and perinatal outcomes in Mali.

ANC is an **essential component of maternal and child health programs**. The **evidence suggests** numerous benefits for pregnant women and their babies (Shiferaw et al., 2021; Fekadu et al., 2018).

- ✓ Evidence from Ethiopia shows that receiving ANC during pregnancy was associated with a significant **reduction in the risk of stillbirth, neonatal mortality, and low birth weight** (Shiferaw et al., 2021).
- ✓ Women who attended **at least one ANC** visit were more likely to give birth to a live neonate that survives (Shiferaw et al., 2021).

In Mali, the use of ANC services yet remains low, with ANC 4+ visits at 43% (Unicef, 2022).

- ✓ Evidence from Ethiopia suggests that **tailored interventions** can increase ANC utilization (Shiferaw et al., 2021).
- ✓ Receiving ANC was associated with an increased likelihood of using **institutional delivery services by 2.2 times** and **postnatal care by 3.1 times** (Fekadu et al., 2018).
- ✓ The usage of institutional delivery services was higher for women who had at least **four ANC visits** (Fekadu et al., 2018).

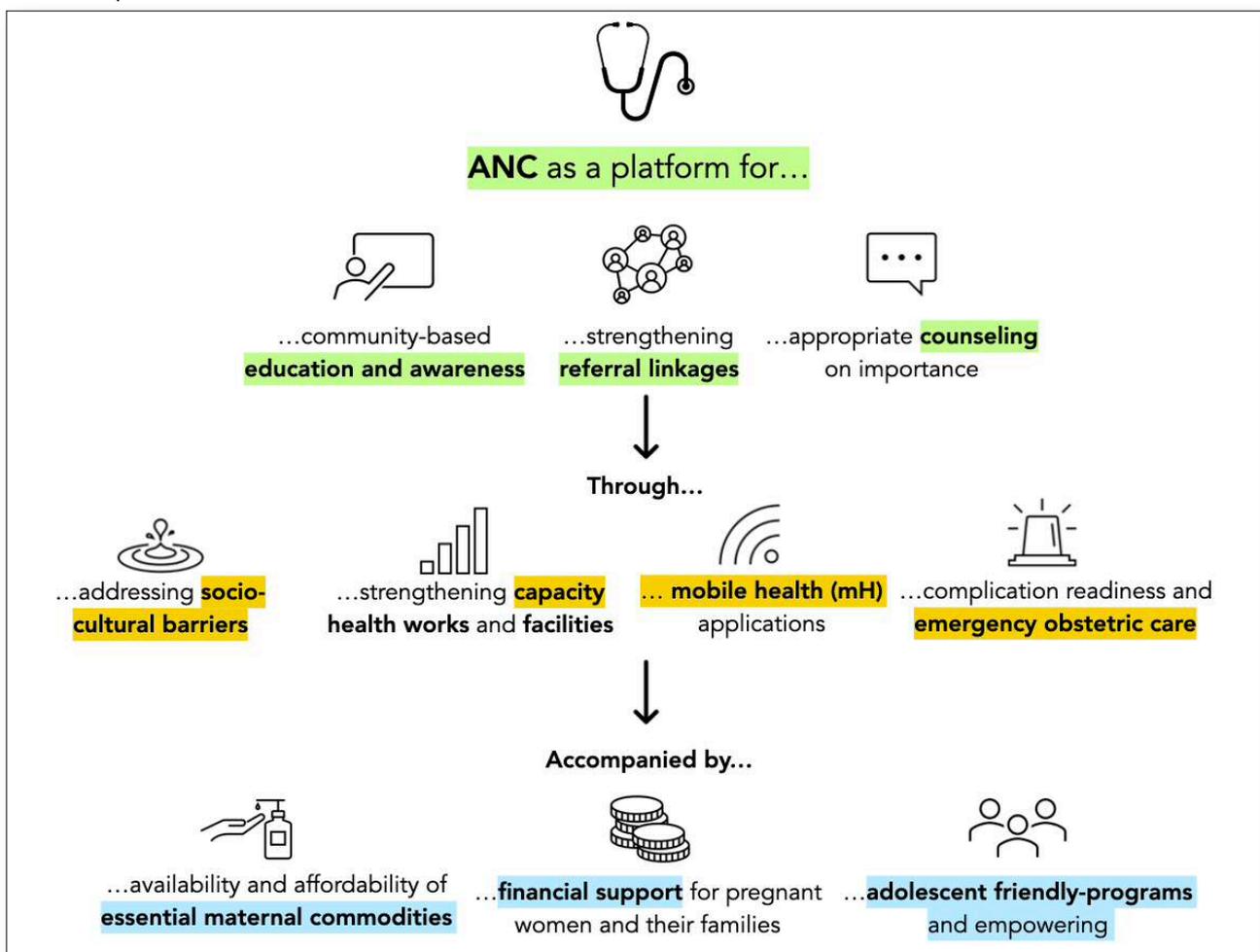


Fig. 2: Making Use of ANC's - A Platform Approach (Fekadu et al., 2018; Shiferaw et al., 2021; Yakubu et al., 2018). Own Illustration and Strategy.

ANC can function as a **platform** tackling many important functions, as depicted in Figure 2. It is important for policymakers to take several further factors into account:

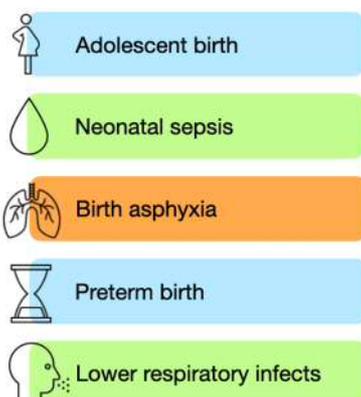
- ✓ Accessibility in **underserved** and **rural** areas for timely access to care (Berhe et al., 2018).
- ✓ Education about **neonatal danger signs** (Demis et al., 2020).
- ✓ Group prenatal care (Wekesah et al., 2016).
- ✓ Possibility of **home visits** (Demis et al., 2020).
- ✓ Interventions from rural Mali showed that access to **obstetric emergency halved** the risk of death two years after implementation (Fournier et al., 2009).
- ✓ Sepsis-specific: Better infection prevention and control measures (Seale et al., 2009):
 - Reducing infection in the **prepartum period** through antiseptics measures and antibiotic prophylaxis.
 - Reducing **susceptibility to infection** by improving maternal health:
 - Nutritional supplementation
 - Investigation for and treatment of sexually transmitted infections
 - Immunization

II. Neonatal Health

A. Risk factors: Prematurity, Birth asphyxia, LRIs

Maternal and neonatal health are closely interlinked. Yet further specific action is required to improve neonatal health. Immediate action is essential as Mali has a high neonatal mortality rate of **33 deaths per 1,000 live births** (Unicef, 2022).

The following key risk factors were identified:



Neonatal death is defined as the death of a live-born infant, within the first 28 completed days of life (WHO, 2006).

Lack of ANC is a significant contributor to maternal and neonatal mortality and can lead to preterm birth, birth asphyxia, and neonatal sepsis.

 **Adolescent births** are associated with a higher risk of neonatal mortality compared to adult births.

- Utilization of **maternity care** in this age group (<20 years) is **low** (Mekonnen et al., 2019).
- Wide **discrepancy** in the use of maternity care services by adolescent mothers across countries in SSA due to individual as well as systemic barriers (Mekonnen et al., 2019).

 In SSA, ~ **17%** of all neonatal deaths result from neonatal sepsis. Yet due to a research gap, the prevalence of **neonatal sepsis** is likely underestimated (Bech et al., 2022).

- Risk factors: Premature birth, low birth weight, maternal infections such as urinary tract infections (UTI), sexually transmitted infections, malaria, poor hygiene practices, and inadequate neonatal care (Bech et al., 2022).

 Evidence from Ethiopia suggests several risk factors are associated with **birth asphyxia**.

- Preterm birth, low birth weight, maternal age of <20 or >35 years, maternal education, and lack of ANC (Ahmed et al., 2021).

Birth asphyxia occurs when a newborn baby's brain and other organs do not receive enough oxygen and nutrients during the birth process. It is an acute and highly dangerous medical emergency. Preventative measures such as adequate prenatal care and skilled attendance at birth can also help reduce the risk of birth asphyxia (Ahmed et al., 2021).



Preterm birth (PTM) can be caused by several factors: (Muchie et al., 2020, Laelago et al., 2020).

- Maternal age
- Multiple pregnancies
- **Birth intervals** of less than 24 months
- Previous preterm birth
- Maternal chronic medical conditions
- Infections (Malaria, HIV, UTI)



LRIs, particularly **pneumonia**, are a leading cause of morbidity and mortality among children in Mali.

According to the Healthy Newborn Network, they accounted for ~ 10% of neonatal deaths in 2019 (HNN, 2021).

B. Don't Forget Your Adolescents: A Call for a Multilayered Approach!

Reducing mortality from specifically asphyxia and PTB has been largely unsuccessful (Griffin et al., 2017). The following strategy, therefore, tackles its roots, namely adolescent birth. **Improving the health and well-being of teenage mothers is an arduous journey**

requiring several **systemic changes**. The strategy aims to improve socio-ecological outcomes for entire communities, especially women. It consists of evidence-based policy interventions developed to lower the high rate of adolescent births in Mali and, therefore, strengthen young women's position.

A promising triad of **contraception, youth-friendly ANCs, and female education and empowering**

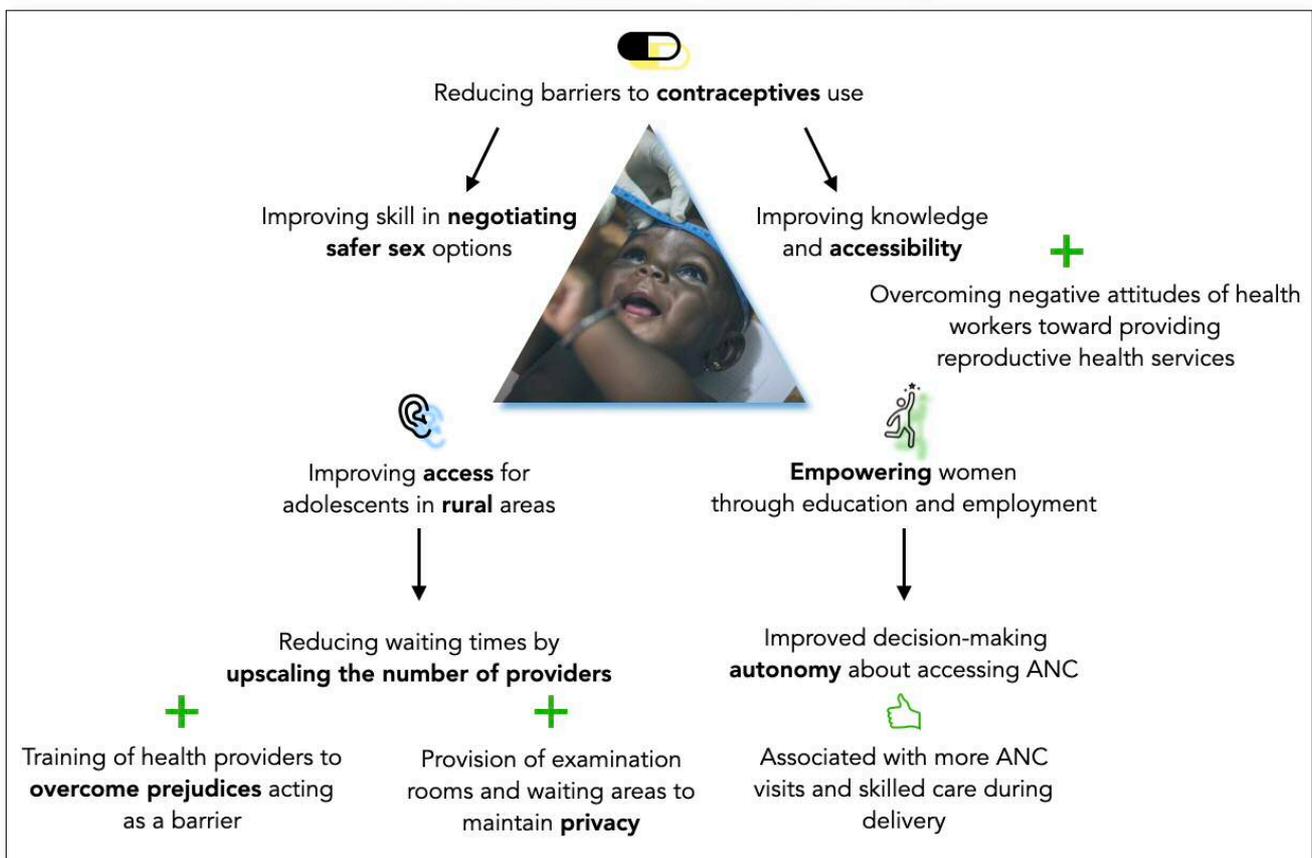


Fig. 3: Triad Approach (Ramaiya et al., 2014 & Yakubu et al., 2018). Own Illustration and Strategy.

Apart from lowering adolescent birth numbers, a further set of actions is needed to tackle Communicable Diseases (CD) **LRI**s and **neonatal sepsis**.

Combining these efforts promises a significant reduction in neonatal mortality:

CHECKLIST

- ✓ Implementing costfree screening for UTI.
- ✓ Routine neonatal sepsis screening.
- ✓ Focus financing on **community-based case management** of neonatal infection.
 - Primary prevention and treatment can be achieved with limited infrastructure and non-hospital care (Griffin et al., 2017).
- ✓ Simplify antibiotic regimes for use in community settings.
- ✓ Improve maternal immunization (Griffin et al., 2017).
- ✓ Introduce clean delivery practices, e.g., educating about the use of chlorhexidine treatment of the umbilical cord (Griffin et al., 2017).
- ✓ Reducing the risk of birth asphyxia through scaling-up skilled obstetric care and timely caesarean section.
- ✓ Significant reduction in neonatal mortality through **ANC** ~ **26% less likely to experience neonatal mortality** (Tekelab et al., 2019): Important to consider:
 - Timing of care
 - Number of visits
 - Quality of care provided
- ✓ Educate about connection between birth intervals and maternal death.

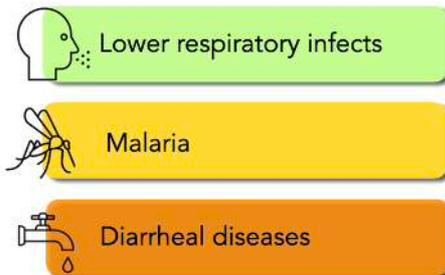
*Address the research gap related to possible upcoming **antibiotic resistance** and providing funding for research.*



III. Child Health

A. Risk factors: LRI, Diarrhea, Malaria

Children aged between 1 to 59 months (UN5) face severe health risks, with a mortality trend of 97 per 1,000 live births (Unicef, 2022). The alarming numbers call for evidence-based action. The identified main risk factors are:



This shows that UN5 are mainly threatened by CDs.

Risk Factors LRI (Beletew et al., 2020)

UN5 are vulnerable to LRI (e.g., pneumonia), and it remains the leading cause of morbidity.

- Use of wood as a fuel source
- Cooking food in the living room
- Caring of the child on mother during cooking
- Non-exclusive breastfeeding
- History of acuter respiratory tract infection (ARI)
- Being unvaccinated
- Parental smoking

In SSA, over two-thirds of all malaria deaths were among UN5, and the region accounted for 93% of all malaria deaths globally in 2020. Although there has been a 47% reduction in malaria mortality rates among UN5 between 2000 and 2019 due to global policies and interventions, one **child under five still dies of malaria every two minutes in SSA** (Sarfo et al., 2023).

Risk Factors Malaria (Sarfo et al., 2023)

- Low household income, poverty, and low maternal education as risk factors
- UN5 in rural areas more susceptible
- Long distance to school, separated parents, outdoor stay linked to malaria
- Poor housing system (e.g., under construction, poor roofing) associated with higher vulnerability
- Households without electricity and toilet
- Households close to river/stream and stagnant water expose
- Poor sanitation, unclean water, domestic animals, and overcrowding
- UN5 in households without insecticide spray or insecticide-treated net (ITN) at higher risk

ITN use by children - percentage of children UN5 who slept under an insecticide-treated mosquito net the night prior to the survey: 79 (Unicef, 2022).

Risk Factors Diarrhea (Alebel et al., 2018)

Childhood diarrhea is still one of the leading causes of mortality and morbidity in this highly susceptible and vulnerable population.

Evidence from Ethiopia suggests that...

- UN5 of illiterate mothers had a 1.7 times higher risk of diarrhea
- No access to latrine facilities had 2.0 times higher risk of diarrhea
- UN5 from rural households had a 1.9 times higher risk of diarrhea
- Children whose mothers did not practice hand washing after visiting a toilet had a 2.3 times higher risk of diarrhea

Percentage of population in Mali using at least **basic sanitation services**: 45 (Unicef, 2022).

B. Enabling communities: Scaling up efforts while considering care-seeking patterns!

HEALTH SEEKING PATTERN

While supply-side efforts to deliver effective and affordable interventions should be scaled up, ensuring timely and appropriate **use by caregivers** remains a **challenge**. It is important to understand actual care-seeking patterns. Parents' decision is influenced by (Zenebe et al., 2022):

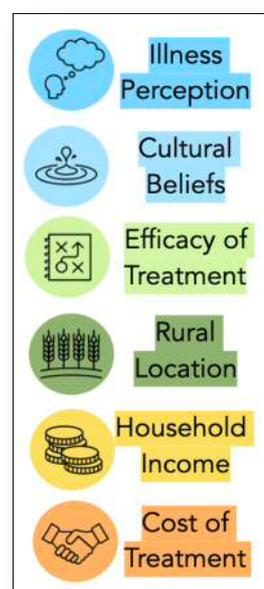


Fig. 4: Understanding Care-Seeking Patterns (Colvin et al., 2013 & Zenebe et al., 2022). Own Illustration.

Decision-making is a **dynamic process**. Research often fails to consider the context of decision-making and care-seeking, especially in limited resource settings. This gap in knowledge should be addressed by paying systematic attention to the context in shaping decision-making and care-seeking. (Colvin et al., 2013; Zenebe et al., 2022).

SCALING UP EFFORTS

The Ministry of Health should consider the following three main upscaling efforts:

1. **Immunization**
2. **Promote Exclusive Breastfeeding (EBF)**
3. **Reduce Air Pollution, improve WaSH Access, and change Hygiene Behavior**

1. IMMUNIZATION Sulaiman et al., 2022 & Gebeyehu et al., 2022.



2. EXCLUSIVE BREASTFEEDING

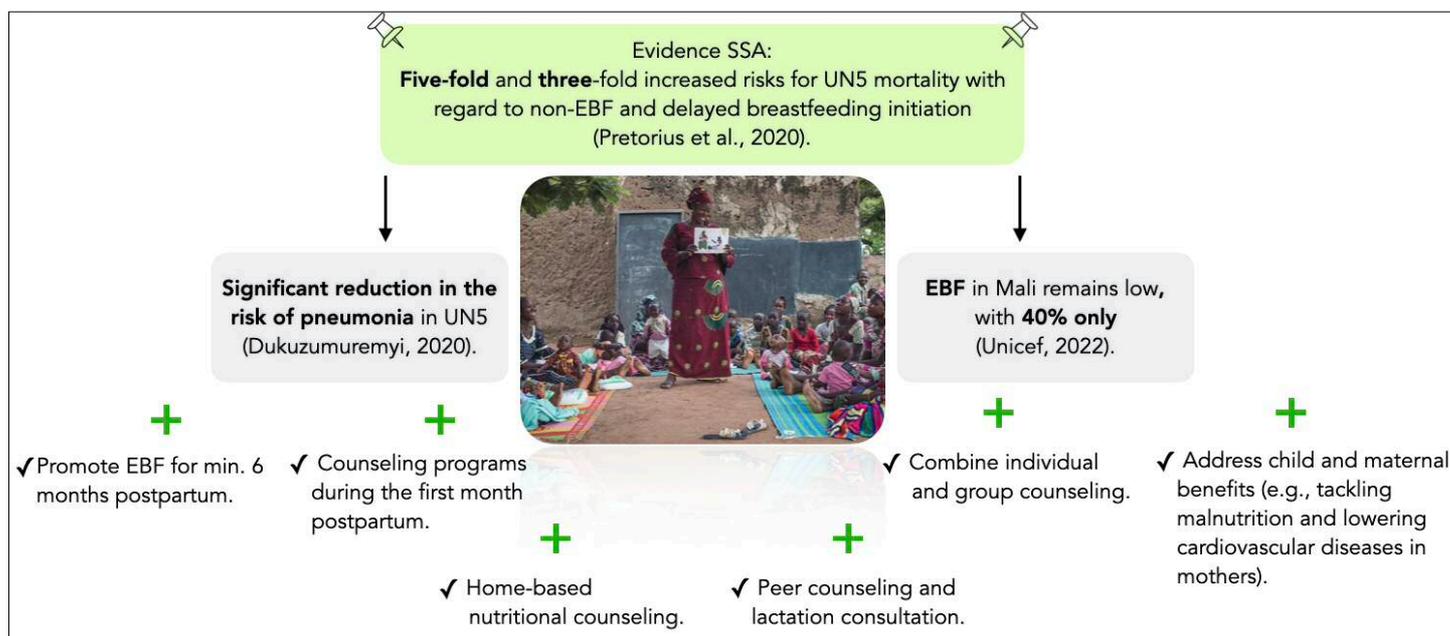
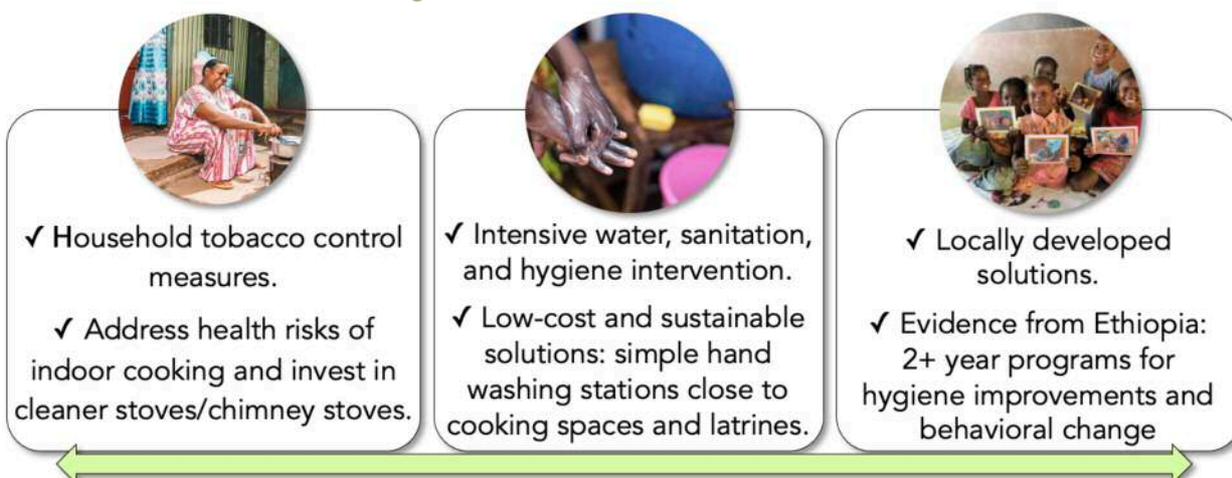


Fig. 5: Exclusive Breastfeeding (Chipojola et al., 2022 & Kinshella et al., 2021). Own Illustration.

3. REDUCE AIR POLLUTION, IMPROVE WaSH ACCESS, AND CHANGE HYGIENE BEHAVIOR Aragie et al., 2021; Bede-Ojimadu et al., 2020; Ejemot-Nwadiaro et al., 2015; Hulland et al., 2013; Momberg et al., 2021; Owili et al., 2017; Scott et al., 2007; Smith et





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Word Count (incl. executive summary, info boxes, in-text citation, checklists, key takeaway box, quote box and all figures): approx. 3.010

Pictures Sources

Picture Background Title Page: Lucas Cuervo Moura. AKDN. Aga Khan Development Network. Mali Health and Nutrition. Online: <https://the.akdn/en/where-we-work/west-africa/mali/health-mali>.

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Figure 3 Picture: Unicef. Child Survival. Online: <https://www.unicef.org/mali/en/child-survival>.

Immunization: Picture One: Unicef. Children's vaccination campaign gathers momentum in Zimbabwe. Online: <https://www.unicef.org/zimbabwe/stories/childrens-vaccination-campaign-gathers-momentum-zimbabwe>

Immunization: Picture Two: Medecins sans Frontiers. Prevention is better than cure - vaccinating against measles in Timbuktu. Online: <https://www.msf.org/mali-vaccinating-against-measles-timbuktu>.

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Figure 5: Picture: Unicef. Online: How mothers and community leaders tackled malnutrition in

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Clean Cooking Picture: Clean Cooking Alliance. We Won't Meet Global Climate Goals Without a Lot More Funding for Clean Cooking. Online: <https://cleancooking.org/news/we-wont-meet-global-climate-goals-without-a-lot-more-funding-for-clean-cooking/>.

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