IMPLEMENTATION OF POSSIBLE SEVERE BACTERIAL INFECTION GUIDELINES IN SELECTED COUNTIES IN KENYA

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DECLARATION AND APPROVALS

This thesis report is my original work and has not been presented for a degree in any other University or for any other award.

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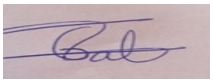
Signature: ……  Date: 28/10/2022

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DEDICATION

I dedicate this work to my family for their continued support emotionally, spiritually, and financially; not forgetting my supervisors for their support and guidance.

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ABSTRACT

Severe bacterial infections fall among the leading causes of neonatal mortality (0-59 days) globally. One in every five neonates in Kenya will die due to these infections. This situation is aggravated by poor health care seeking behaviors by caregivers, poor supply chain management, low health provider staffing, low care giver and community health volunteer knowledge of PSBI presentation and management, dysfunctional referral pathways among others. The purpose of this study was the implementation of PSBI guidelines and generation of evidence aimed at addressing challenges in neonatal and young infant care in hard-to-reach resource-limited settings. The objective of this study was to demonstrate feasibility, acceptability, and sustainability of PSBI implementation within the revised IMNCI guidelines where referral is not feasible in selected counties in Kenya. The study employed implementation research where an initial formative context mapping and assessment was conducted with routine quarterly follow up assessments. Data collection entailed a capacity assessment in each of the four counties on various health system domains, facility audits in 12 purposively selected facilities to assess preparedness of facilities to manage PSBI, partner mapping to identify potential stakeholders for collaboration in each county, mapping of past, current and planned staff trainings, social costs analysis, Policy/stakeholder analysis, assessment of community/provider perceptions and practices regarding newborn care using in-depth interviews and focus group discussions. This was followed by six-monthly case studies and narratives. Quantitative data was analyzed using independent T test and Pearson's chi-square. Qualitative data was described using themes and narratives. Ethical clearance was sought from Mount Kenya University Institutional Scientific Ethics Review Committee. The data was reported using tables, graphs, pie charts and narratives. Dissemination of findings was through stakeholder forums, advocacy, local and international conferences, and publications in peer-reviewed journals. The health systems capacity assessment indicated average score of 70% across counties and service delivery domain where Turkana, Mombasa and Kilifi scored a green, but Bungoma scored amber of 65%. Only 29.2% of the facilities reported having a functional newborn unit/area for neonates from the facility assessment. Qualitative data alluded to several cultural contextual factors that predisposed young infants to infections. The data also revealed that most caregivers were able to identify danger signs of PSBI and roles of other household members were identified in line with influencing factors on care seeking behaviors. The interventions and decision support tools developed and tested to. facilitate integration of PSBI include a Job aid chart for health providers to aid in assessment and classification of sick young infants, informational pamphlets for caregivers and health providers, and a PSBI/IMNCI Assessment and Follow up tool for appropriate documentation of management of sick young infants. The findings on implementation research outcomes showed that indeed the PSBI guidelines are acceptable, adoptable, with clear indication of their fidelity, feasibility, and sustainability as public health interventions in low resource settings where referral for sick young infants is not feasible. Consideration of contextual variation, appropriate resource allocation, and training of health providers is necessary for sustainable integration of PSBI guidelines in Kenya's healthcare system.

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LIST OF ABBREVIATIONS AND ACRONYMS

AFRINEST	African Neonatal Sepsis Trial
CHMT	County Health Management Team
SCHMT	Sub County Health Management Team
CHV	Community Health Volunteer
CHW	Community Health Worker
DHIS	District Health Information System
HEW	Health Extension Worker
HMIS	Health Management Information System
IMCI	Integrated Management of Childhood Illnesses
IMNCI	Integrated Management of Neonatal Childhood Illness
KPA/KEPRECON	Kenya Pediatric Association/Kenya Pediatric Research Consortium
MANOVA	Multivariate analysis of Variance
MDG	Millennium Development Goals
MKU	Mount Kenya University
PHC	Primary Health care
PSBI	Possible Severe Bacterial Infection
SATT	Simplified Antibiotic Therapy Trials
SDG	Sustainable Development Goals

SPSS	Statistical Package for Social Science
WHO	World Health Organization

OPERATIONAL DEFINITIONS OF KEY TERMS

Sick Young Infants Children with possible severe bacterial infection aged 0-59 days.

CHAPTER ONE: INTRODUCTION

This chapter will provide the context for the research, which will attempt to identify the variables under study, problem statement, study goals, the study scope, and study importance.

1.1 Background of the Study

This study sought to address challenges and document evidence of best practices towards successful incorporation and sustainability of PSI guidelines within the Kenyan set up. Severe bacterial infection is responsible for a fifth of the annual global neonatal mortality burden of 2.7 billion and 3% of all disability-adjusted life years (Seale *et al.*, 2014; WHO, 2018). Most of these deaths occur in low-to-middle income countries (LMICs) defined by high rates of infections, unskilled birth attendants and high rates of home deliveries (Bhutta *et al*., 2005). Baqui *et al*. (2015) affirms this with the findings indicating that one in every five neonates in LMICs will develop life-threatening infections. Reports indicated that families of sick young infants' refuse hospital referrals and the stated reasons include cultural beliefs, financial constraints, and concerns over the quality of care in the referral facility (Zaidi *et al*., 2012; Ekwochi *et al*., 2015). An expert consultation reviewed low referral adherence for sick young infants and gave recommendations for clinical trials on evaluation of simplified antibiotic regimens in the management of severe infections where referral is not possible thus improving access to care and the survival of newborns (WHO, 2007).

Following clinical trials in several countries in Africa and Asia, the World Health Organization (WHO) released new guidelines titled Managing possible serious bacterial infection (PSBI) in young infants when referral is not feasible to address this challenge with a specific focus in these hard-to-reach settings (WHO, 2015). These guidelines were incorporated into the national Integrated Management of Newborn and Childhood

Illnesses (IMNCI) guidelines in Kenya. A consortium of three partners; Population Council, Mount Kenya University and Kenya Pediatric Research Consortium (KEPRECON) supported the Kenyan ministry of health (MoH) to scale up these treatment regimens through building confidence in the management of sepsis in young infants. Several multi-country antibiotic trials have indicated that PBSI guidelines result in a remarkable reduction in young infant mortality using a simplified treatment regimen coupled with low-cost implications on current existing health systems (WHO, 2017). Context specific planning particularly on health systems is key towards attainment of Universal Health Care and integration of PSBI guidelines. Priority areas identified in Every Newborn Action Plan provide crucial areas that this research intends to address. They include cost realignment, funding harmonization and scale up implementation focusing on community health strategies and progress-driven interventions with clear accountability (Mason *et al.*, 2014).

The national health strategy on improving health care access for all, dubbed 'Universal Health Care' is uniquely inclined towards Primary health care and IMNCI, with the community health strategy playing a key role towards achievement of this. IMNCI, through which the WHO PSBI guidelines are incorporated, is implemented in health facilities and through some 60,000 community health volunteers in Kenya (Kumar *et al*., 2014). This care provision system has several advantages and weaknesses which the PSBI project and this research study strengthened, leveraging on existing maternal and child programs through stronger platforms for newborn, postnatal and young infant care. A triple return on investment can be achieved by improvement of quality of perinatal care and referral pathways by mitigating against the burden of maternal mortality, neonatal sepsis and mortality (Aluvaala *et al*., 2015).

1.2 Problem Statement

Up to 20% of Kenya's neonatal mortality rate of 22 (infant mortality as high as 32) for every 1000 live births is resultant from sepsis (KNBS, 2015). This is significantly higher than the WHO's Every Newborn Action Plan which has a set target of 10 or fewer neonatal deaths per 1000 live births in all countries by 2035 (Lawn *et al.,* 2014). Clinical diagnosis of bacterial sepsis is challenging with delayed recognition of signs and symptoms by the primary care giver at home resulting in disease severity and fatality. Clinical trial results from the AFRINEST and SATT trials showed high refusal rates by givers (89%) towards in-patient hospitalization and the administration of injectable antibiotics (AFRINEST, 2013). In regions with limited accessibility in rural and urban settings in Kenya, first-line care is rarely administered by health personnel with specialty pediatric training, and laboratory investigations to support diagnosis usually lacking in these resource-poor settings (Seale *et al*., 2014). The situation is aggravated by poor care seeking behavior in early life, low awareness among caregivers and community health volunteers, poor management of supply chain, low health provider staffing personnel (which results in disaffection with services provided), dysfunctional referral pathways and negative cultural beliefs. All these challenges contribute to frontline staff's deficit of knowledge, skills, and confidence in PSBI management. It is for these reasons that the World Health Organization developed the simplified antibiotic regimens under PSBI guidelines for SYIs provided at Primary Health Care (PHC) level where referral is not feasible with evidence showing that they are effective and can save lives. Prior to this study, these guidelines had not been implemented in Kenya translating into lack of evidence and learnings crucial in subsequent countrywide scale up in Kenya.

The importance of strengthening postnatal and young infant care in Kenya through implementation of PSBI guidelines in the revised IMCI guidelines (demonstrating feasibility, acceptability, and sustainability in selected representative sites in Kenya) cemented the irrevocable importance of this study. Implementation research, which is an imperative cornerstone of PSBI scaling up efforts, facilitated sustained uptake through a vigilant accounting of resources and microsystem support required to ensure utilization of PSBI guidelines by frontline staff, caregivers, and county health systems. The health systems perspective, coupled with a contextual approach, facilitated understanding and subsequent mitigating measures against identified bottlenecks. This study sought to reduce young infant mortality whilst addressing challenges and documenting evidence of best practices towards successful incorporation and sustainability of PSBI guidelines within the Kenyan set up.

1.3 Justification

Prompt administration of antibiotics can effectively result in prevention of adverse events in neonatal sepsis (El Din *et al*., 2015). Bang *et al.,* (2009) noted that home-based neonatal care is feasible, acceptable and resulted in a 50% reduction in infant mortality. In a discussion on the challenges of rational development of guidelines in developing countries for the management of neonatal sepsis, Dickson *et al*., (2014) noted that a reduction of the burden of neonatal morbidity and mortality depends on scaling up essential interventions which could reduce mortality in these young infants by two thirds if achieved universally. Improving the management of infections in neonates depends on effective guidelines. Management of possible severe bacterial infection consistent with the WHO guidelines has been demonstrated as sustainable, feasible and acceptable in poor resource settings especially where referral is not feasible. This approach supported the reduction of morbidity and mortality in young

infants aged 0-59 days while accelerating appropriate care seeking leveraged on the existing community health strategy.

This study aimed at contributing to the reduction in mortality of young infants by incorporation of PSBI guidelines into existing IMNCI strategies while using implementation research to iteratively improve newborn care by leveraging on the health systems approach. The focus of implementation research was to strengthen the health systems using a holistic approach to the WHO health systems building blocks; service delivery, health workforce training, emphasis on health information systems, improving access to essential medicines, integrated health financing and leadership and governance (WHO, 2010). Systems strengthening inputs were implemented including in-service training, creation of new demand and supply tools for commodities management, community mobilization and engagement, incorporation of community health volunteers.

1.4 Research Questions

- What are the county health systems gaps and facilitators in the management of PSBI with or without referral?
- What are the innovative, sustainable community health strategies that can support implementation of the new PSBI guidelines in the revised IMCI protocols?
- What are the current health system policies influencing uptake of PSBI guidelines?
- What are the social cost implications on community and caregivers following implementation of PSBI guidelines?

1.5 Objectives

1.5.1 Broad objective

To demonstrate feasibility, acceptability, and sustainability of implementation of the 2015 WHO PSBI guidelines in the revised IMNCI guidelines where referral is not feasible, in Kenyan representative settings

1.5.2 Specific objectives

i. To assess the county health systems gaps and facilitators in the management of PSBI, with and without referral, in selected counties in Kenya
ii. To develop innovative, sustainable community health strategies in implementation of PSBI guidelines in selected counties in Kenya
iii. To describe the current health systems policies influencing uptake of PSBI guidelines in selected counties in Kenya
iv. To assess the social cost implication of implementation of PSBI guidelines on the community and caregivers in selected counties in Kenya

1.6 Anticipated Outcomes

Sustainable implementation of PSBI guidelines in the revised IMCI protocols to impact policy change, enhance methodical learning and adaptation nationally.

1.7 Theoretical Frameworks

Socio-ecological model

This theoretical framework is based on the Socio-ecological model which leverages on a complete model of public health action whose foundation lays in four strategies of the public health action cycle: assessment, planning, implementation, and evaluation. In the assessment phase, health determinants and health problems with high impact on health are identified. These determinants provide leverage points for public health

interventions. In the planning phase, strategies in public health appropriate in influencing these factors are selected and implemented. Evaluation looks at changes within the health development cycle. Four elements; environmental structure, environmental process, system structure and system process form the targets of public health interventions aimed at influencing health development in a salutogenic direction. Salutogenesis focuses on factors supporting human health and their well-being rather than focusing on disease causative factors. The health determinants and dimensions are subsequently considered as public health outcome indicators. As interventions develop within the socio-ecological model, its usefulness is described as it classifies public health process indicators (i.e. measures of ongoing interventions). This model was used to evaluate county health systems gaps and facilitators, development of sustainable community health strategies and the assessment of social costs implications.

Policy triangle Framework (Walt and Gilson, 1994)

Health policy research focuses majorly on the content of policy (what is the policy mainly about), context (the need of this policy), processes (how the policy is brought forward and implemented) and actors (participants influencing formulation and implementation of the policy). The framework is grounded in an economic-political angle with consideration of how all the above four elements interact to shape policy. This simplified approach helps researchers to understand and systematically analyze health –related policies. Walt and Gilson believed that health policymaking is an interactive process with special socio-economic and cultural contexts where actors are at the center of this process. The policy triangle framework is vital in exploring different factors that might affect health policy and its implementation. The policy triangle framework was critically relevant in the evaluation of health systems policies influencing uptake of PSBI guidelines.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Infections are one of the leading causes of neonatal mortality in Kenya. Severe bacterial infections are continuously among the leading causes of neonatal mortality globally. 40% of deaths in under five children occur in the neonatal period (WHO-UNICEF, 2011). Neonatal mortality rates have experienced a decelerated rate of decline compared to post neonatal period of ages 1-4 years with estimates of about 2.7 million deaths annually every year (Baqui *et al*., 2015; Lawn *et al*., 2009). 98% of these deaths are in developing countries (WHO, 2017). Worldwide and in Kenya, 20% of mortality in neonates, about 560,000 deaths, is as a result of bacterial sepsis (WHO, 2017; Le Geyt & Hauck, 2016; KNBS, 2015). Young infants with signs of severe bacterial infection from resource-limited settings do not access the recommended inpatient treatment (Laxminarayan *et al*., 2016). Studies in which low adherence to referral was evident report cultural beliefs, constraints in finances and concerns pointing at low quality of care in health facilities as some of the reasons for refusal of referral (Ekwochi *et al*., 2015). Baqui *et al*. (2015) concluded that most infants with severe infection referred for treatment might not reach the hospital and access treatment increasing their risk of death. Due the absence of reliable laboratory diagnostics coupled with the high risk of adverse effects, empirical management and clinical diagnosis of neonatal infections is common practice (WHO, 2017).

2.2 AFRINEST, SATT Clinical trials and Proof of Efficacy

Diversity in the range of causative agents of clinical severe bacterial infection was evident following positive blood culture results and Campylobacteraceae was reported as the most common pathogen (Mir *et al*., 2017).

A simplified regimen of antibiotics in the treatment of severe bacterial infection in young infants was shown to be as efficacious as the recommended clinical treatment in situations where referral was not possible (WHO, 2013; Tshefu *et al*., 2015; Baqui *et al*., 2015). This evidence was supported in the Simplified Antibiotic Therapy Trials (SATT) in Pakistan that indicated simplified antibiotic regimens with fewer injections administered near home or in a community setup by a trained health provider were as efficacious as a reference strategy comprised of penicillin-gentamicin injections with refusal of referral (Mir *et al*., 2017).

Clinical trials in Africa and Bangladesh (AFRINEST And SATT trials) resulted in the development of new WHO guidelines for the management of young infants with possible severe bacterial infection where referral is not feasible (WHO, 2015). The choice of drug regimen for the guidelines followed a methodical review of micro-organisms causing neonatal sepsis, patterns of antimicrobial resistance, antibiotic pharmacodynamics, and evidence of success in treatment with various injectable and oral antibiotics in young infants (Baqui *et al*., 2008; Zaidi *et al*., 2009; Thaver *et al*., 2009; WHO-UNICEF, 2009; Zaidi *et al*., 2012). Susceptibility testing indicated that a treatment regimen based on amoxicillin and gentamicin covered more than 80% of pathogens encountered (Mir *et al*., 2017). The WHO reference standard for management of sick young infants with possible severe bacterial infection stands at referral for hospitalization with treatment regimen of a 7-10 course of ampicillin or benzylpenicillin plus gentamicin (WHO, 2014; WHO, 2005). While hospitalization remains the cornerstone of management of severe infection in neonates (Dickson *et al*., 2014), in many low-income countries, these parenteral treatments might only be available in inpatient setups (Fuchs *et al*., 2018).

The findings from the AFRINEST and SATT trials indicate the need for continuous, increased investment in point-of-care diagnosis of children with bacterial infection at community level leveraged by improved measures of treatment failure indicated as mortality predictors (Nair, 2017). Conclusions drawn from these clinical trials indicated the efficacy and safety of care provision to young infants with PSBI at lower level facilities using a simplified treatment regimen resulting in the development of an evidence-based guideline i.e. PSBI guidelines (WHO, 2015). In addition, improved adherence to the simplified regimen was noted in comparison to reference treatment. The simplest regimen with two injections and oral treatment had the highest adherence and the lowest treatment failure (AFRINEST, 2015). WHO recommended integration of PSBI guidelines into existing interventions for preventing and treating PSBI and IMNCI guidelines are the primary platform. A framework guide was provided for operationalizing management of PSBI using eight components; coordination and policy setting, human resource, supply chain management, service delivery and referral, communication and social mobilization, supervision and performance quality assurance, monitoring and evaluation and HMIS, costing and financing (WHO, 2017).

2.3 World Health Organization-Possible Severe Bacterial Infection (PSBI) guidelines

The guidelines were designed by a panel of international experts, informed through review of existing evidence and intended for use in resource-poor settings where referral is inaccessible. They also guide policy makers on infant and neonatal care. In addition, the guidelines seek to provide guidance on implementation, scale up and methodical directive on the role of home visits by community health workers (CHWs) and community health volunteers (CHVs) in the identification of signs of severe infection in neonates and young infants (WHO, 2017). Close follow up is vital for young infants

managed on an outpatient basis without the possibility of referral (WHO, 2015). The crucial importance of these guidelines is evidenced by the study by Zaidi *et al.* (2011) that illustrated that in order to achieve a substantial reduction in neonatal mortality, it necessitates both facility based and community based interventions linked by a functional referral system. The PSBI guidelines can encourage community treatment and a reduction in neonatal deaths caused by bacterial infections (Liu *et al*., 2016).

The antibiotic regimen options for management of PSBI are as stipulated in the table below.

Table 1: PSBI Treatment options

PSBI Category	**Treatment Regimen**	**Number of injections**
A. Control Arm (reference treatment	IM gentamicin and procaine penicillin OD for 7 days	14 injections
Simpler regimens (**Severe clinical infection**)		
B.	IM gentamicin OD and oral amoxicillin BD for 7 days	7 injections
C.	IM gentamicin OD and procaine penicillin OD for 2 days, thereafter oral amoxicillin BD for 5 days	4 injections
D.	IM gentamicin OD and oral amoxicillin BD for 2 days, thereafter oral amoxicillin BD for 5 days	2 injections
E. (**Fast breathing**)	Oral amoxicillin BD for 5 days	No injection

The Ministry of Health (MoH) advocates for the treatment regimen entailing two doses of injectable gentamicin and five days of oral amoxicillin with follow up on the 4th day

(option D) (MoH, 2018). This is the most simplified regimen, with decreased discomfort to the child, which proves as effective as the recommended treatment by WHO and its scale up will result in a reduction in mortality in situations where referral is difficult (Lokangaka *et al*., 2018). Fuchs *et al*. (2018) correlate with MoH recommendations indicating that this regimen would provide advantages over the others due to minimal invasive procedures with only two injections, promoting adherence to treatment and by extension, allows administration of high aminoglycoside dosages targeting high minimal inhibitory concentrations (MIC) while preventing potential nephrotoxicity. The study also affirmed that the PSBI guidelines accord with current evidence on new antimicrobial resistance and drug safety.

The drugs recommended in the PSBI guidelines are included in the WHO Model list of essential medicines. Essential drugs are intended for availability within the context of existing health systems in adequate quantities, appropriate dosages, with assurance of quality and affordability. (WHO, 2015; WHO, 2017).

Classification of sick young infants with PSBI (0-59 days) at a primary health facility according to the IMNCI guidelines requires any one or more of the following signs to be present (WHO, 2015);

- fast breathing (60 breaths per minute or more)
- severe chest in-drawing
- fever (38 °C or greater)
- low body temperature (less than 35.5 °C)
- Movement only when stimulated or no movement at all.
- not able to feed since birth or stopped feeding well (confirmed by observation)

- convulsions

Young infants with PSBI are grouped into two subgroups based on clinical severity.

- Fast breathing pneumonia-young infant (0-59 days) with a respiratory rate of 60 breaths/minute as the only sign of infection
- Clinical severe infection- young infant (0-59 days) with at least one sign of severe infection (i.e. movement only when stimulated, not feeding well on observation, temperature ≥ 38 °C or < 35.5 °C or severe chest in-drawing).

While improving access and availability of hospital-based management is imperative, provision of an effective treatment regimen at primary-level facilities and communities when the feasibility of referral is lacking would increase accessibility to potential lifesaving care for infants (WHO, 2015).

2.4 Integrated Management of Neonatal and Childhood Illnesses (IMNCI)

The integrated management of childhood illnesses (IMCI), supported by the WHO guidelines for the management of childhood illnesses, focuses management of the main causatives of mortality in children in low health care resource countries (WHO, 2013; WHO, 1995). Infectious causes of mortality in sub-Saharan Africa had reduced between 2000-2015 but pneumonia, diarrhea, malaria and sepsis remain crucial areas of focus and emphasis for child survival efforts (Liu *et al*., 2016).

Significant progress on child survival has in the past been achieved through a cohesive action plan in achieving MDG 4 in the past two decades warranting the need for unified continued actions to achieve the SDG child survival targets by 2030 and bring an end to preventable child deaths (Liu *et al*., 2016; Glass *et al*., 2012). Even though, there is need for concerted and enhanced efforts in scaling up verified life-saving interventions so as to achieve the SDG child survival target (Liu *et al*., 2016). Findings from the study by

Khalil *et al.*, (2015) reinforce the imperative need for intensified and accelerated action to decrease the burden of mortality and morbidity in children.

2.5 Community health strategies in PSBI implementation

WHO and UNICEF recommended home visits to improve newborn survival after studies showed home-based interventions can prevent 30-60% of mortality in newborns in high mortality areas (WHO, 2009). Key studies in Africa have shown that up to two thirds or more of families do not accept referral for hospitalization in young infants having PSBI (Tshefu *et al.*, 2015; AFRINEST, 2013). Home visits are essential in the identification of bacterial infection danger signs and to promote care seeking (WHO, 2014). This can be performed by skilled health providers including trained community health workers and volunteers (WHO-UNICEF, 2017). In a study on the effect of community-based newborn care intervention where referral was not feasible, the findings reported a 34% reduction in neonatal deaths (Baqui *et al.*,2008). Similarly, in Ethiopia, health extension workers (HEW), equivalent to community health volunteers (CHVs), were able to identify signs of PSBI with high treatment compliance in children managed in a community setting by the HEW. Where referral is not feasible, these health extension workers can manage PSBI infants with simplified antibiotic treatment with coverage of up to 50% (Hailegebriel *et al.*, 2017). Substantial modification in behavior and a reduction in neonatal mortality followed the implementation of a community-based behavior change management promoting interventions aimed at preventing high-risk newborn care practices (Kumar *et al.*, 2008). Successful identification of infants with possible severe bacterial infection requires a community level provider with adequate skills to recognize, manage and refer sick young children. From the AFRINEST field trials, it was indicated that community health workers working in conjunction with nurses can administer the antibiotic regimen, including

injections, safely with a high community coverage (Dewez *et al*., 2015). However, according to Hodgins & McPherson (2017), it requires considerable program efforts to achieve high coverage of home visitations by CHWs and ensuring that what happens during these contacts contributes to better health outcomes.

During postnatal visits, identification of signs of illness/ danger signs in young infants increased early health seeking. CHWs show high specificity of diagnosis of severe illness (WHO, 2015).

2.6 Health system approach to assess gaps and facilitators in PSBI implementation

In a study by Simen-Kapeu *et al*., (2015) on multi-country analysis of health system bottlenecks and potential solutions, their findings identified significant barriers as health workforce, community ownership and partnerships, health financing, HMIS in that order.

In Ghana, strategies used in overcoming health system barriers were identified and included expanding and redistributing existing maternal health resources, training of skilled caregivers, special programs targeting the neediest women. Structural changes in maternity services and nursing practice with an emphasis on doctor-patient relations were viewed as pivotal towards addressing health system barriers (Ganle *et al*., 2016). Investments in improving workforce performance and distribution has been highlighted as a solution towards health system barriers in basic neonatal care (Enweronu-Laryea *et al*. 2015). Community based interventions need to create demand for high-quality, accessible, family-centred care, inclusive of kangaroo mother care, for the survival of every newborn (Moxon *et al*., 2015). Dickson *et al*. (2014) identified several key factors to reduce neonatal mortality which included workforce planning, financial protection measures and dynamic leadership including innovation and community empowerment. One of the key recommendations from this study was the proposition of a country-

driven, data-priority process focused on sharpening national health plans, seizing opportunities to address gaps in quality of care of young infants and a systematic scale up targeting every mother and newborn with particular focus on resource limited areas.

In a global situational meta-analysis on facilitators and barriers to quality of care in maternal, newborn and child health, Nair *et al*. (2014) concluded that facilitators and barriers can be grouped into six management domains in line with the WHO framework: leadership, organizational capacity, information, client and population engagement, standards and regulations and models of care. Conclusions drawn from this study pointed at the importance of technical support using decision support systems to improve provider satisfaction. Further feasibility studies are needed to assess implementation of low-cost decision support systems within the healthcare system. This also alludes to the necessity of mutual measurement tools for maternal, newborn and childcare to evaluate the facilitators and barriers to quality health care (Nair *et al*., 2014).

In an evaluation of health management systems in Kenya by Health Metrics Network, several concerns were raised over the lack of a policy framework guiding health information systems and low reporting rates (Kihuba *et al*., 2015). Kenya responded by investing in policy development and implementation of the District Health Information system (DHIS 2) in September 2011 (MOH, 2010).

A health systems approach in this implementation research offers a unique view of possible health system barriers. Integration of newborn interventions requires expansion and redistribution of the health infrastructure and resources to enhance quality of care and reduce mortality (Ganle *et al.,* 2015).

2.7 Policy Review

Evidence based research is underutilized in policy development and review (Jardali *et al.,* 2009). Utilization of research findings is ensured when policymakers and stakeholders are engaged in research priority-setting exercises. Policies and guidelines should be equitably implemented to ensure maintenance of standards across all sectors. This requires targeted funding, effective leadership, improved human resource performance and placement as well as well-organized client-centered services geared towards community mobilization to participate in national newborn strategies (Enweronu-Laryea *et al.,* 2015). Stakeholder analysis aims to evaluate, understand and determine stakeholders' perspective and relevance to a project or policy (Varvasovszky, 2000). It highlights the importance of various actors in the policy-making process and review. The information generated following stakeholder analysis can be used to develop action plans to increase support for reform of policy and guiding participatory consensus-building process (Schmeer, 1999). The recognition of stakeholders' role in policy determination, implementation and outcome reiterates the importance of stakeholder mapping and policy analysis in sustainability of health programs, in this regard; the PSBI guidelines.

Social cost implications of PSBI

Results from randomized trial studies have indicated cost-effectiveness of scale up of outpatient management of PSBI where referral is not feasible using fewer injections and oral injections (Garg *et al*., 2021). Community-based treatment has a proven cost burden and less disruptive to household and family processes with reduced risks of nosomial infections (Zhang *et al.,* 2016). There is however, no contextual data that highlights the social costs of implementation of new guidelines and the qualitative perspectives of community members on the efficacy of these guidelines in reducing

household and societal demands on caregivers. Low quality research data on efficacy of community-based interventions (antibiotics) indicates a need for cost-effectiveness studies of simplified community-based antibiotic regimens in low resource settings (Duby *et al*., 2019). The cost effectiveness of PSBI integration is dependent on incorporation within existing community strategies leveraging on community health workers (Mathewos *et al.,* 2017). Outpatient management of PSBI cases has been proven most cost effective with use of two doses of gentamicin with an oral course of amoxycillin dispersible tablets (Garg *et al*., 2021).

Summary of literature review

Lack of reliable laboratory diagnostics in low resource settings necessitates empirical management and diagnosis of neonatal infections. Clinical trials conducted in Africa and Asia showed efficacy and safety in young infants managed using a simplified treatment regimen in PHC facilities and where referral is not feasible. The WHO used this evidence to develop PSBI guidelines and recommended their integration into IMNCI protocols. There is documented evidence of success in management of SYIs with PSBI using the community health system working in cooperation with nurses in PHC settings. In addition, a health system approach in the implementation of interventions is crucial to facilitate decision making in the identification and expansion of health resources, enhancement of quality of care and mortality reduction. Understanding the current policy environment is equally crucial to the success of intervention implementation and its sustainability in a health system. Implementation research offers a unique learning guide for systematic change creation based on methodical learning to inform future scale up of PSBI guidelines in Kenya.

Conceptual Framework

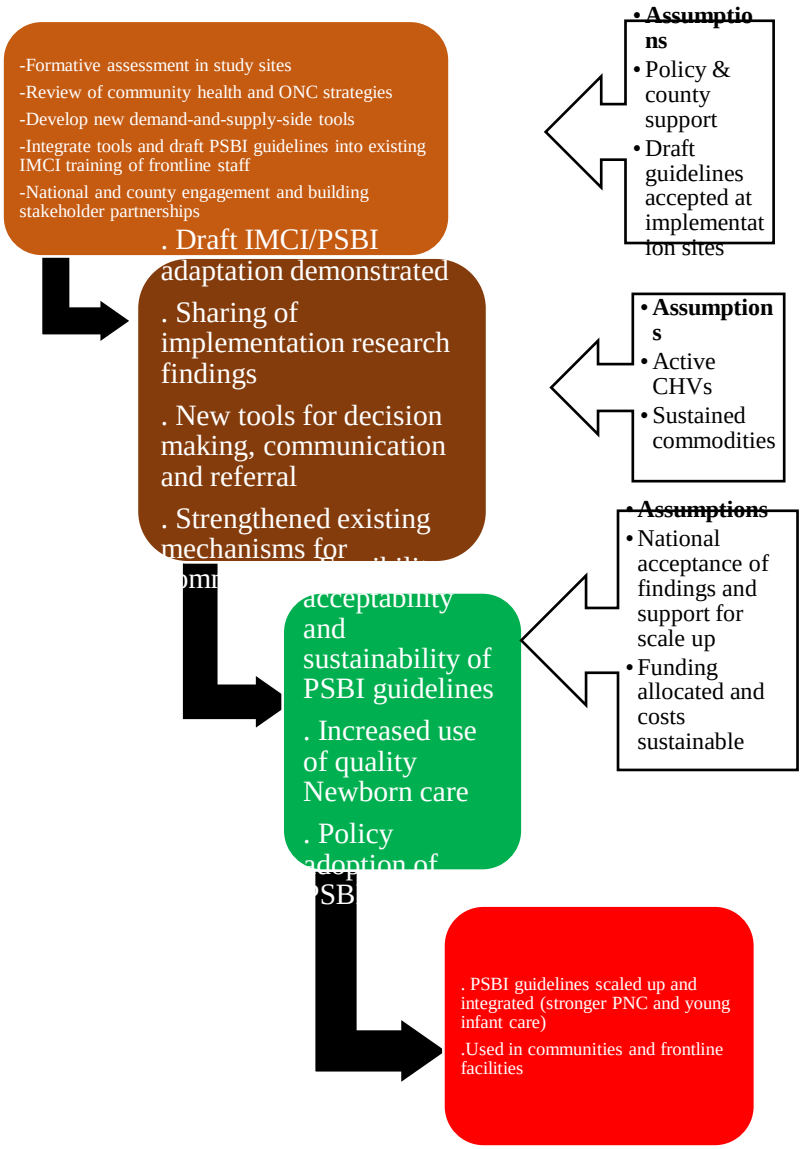


Figure 1: Theory of Change

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research design

The study utilized implementation research and policy analysis tools to evaluate the implementation of PSBI guidelines and how health systems may hamper or facilitate scaling up of PSBI within the IMNCI service delivery, in the context of Kenya's devolved structures. This was a longitudinal, interventional research design using mixed methods of data collection. Implementation research involved "doing by learning" and adjusting the implementation process whilst using a monitoring system to track changes as measurement of the effects of strategies was conducted. From formative assessment to effecting programmatic changes, the cyclic process entailed review and support of facilities to identify bottlenecks and implement changes to institutionalize management of SYIs with PSBI; strengthening community-facility linkages and referral process of SYIs; strengthening quality improvement activities; advocacy activities at all levels to support PSBI uptake; strengthening skills and confidence building among frontline health providers through development of decision-support tools. This involved a formative context mapping and assessment of health facilities (including staff and community health volunteers), longitudinal interventional research design informing the development and introduction of new decision-support tools to support PSBI implementation, six monthly rapid assessments and routine monitoring, assessment, and documentation of social costs to identify incremental costs and resources in implementation of PSBI at the community level. The formative context mapping and assessment entailed mixed methods (qualitative and quantitative methods); quantitative methods for the capacity assessment and facility audit; qualitative methods to assess the community perceptions and practices regarding newborn care. This was integrated into a robust monitoring system with structured follow-ups and documentation of outcomes.

An analysis of policies and their implication on PSBI implementation was carried out to describe their influence on PSBI uptake.

The strategies and interventions were developed following the formative assessment with the data received guiding the strategies' development to build provider confidence in the management of SYIs.

3.2 Study sites

The study sites were purposefully selected reflecting different health care barriers and populations in Kenya. The research study was conducted in four representative sites; Bungoma, Turkana, Kilifi and Mombasa as illustrated in appendix 5. Each of these sites represented a key population in the Kenyan context for which PSBI guidelines were developed.

Turkana-This northern frontier county presents a rural setting with socio-economic, cultural and geographic vulnerabilities. The county of Turkana poses challenges of culture and remoteness of communities. This is coupled with the largely nomadic lifestyle of the Turkana people. The population of Turkana County is estimated at 926,976 (KDHS, 2014).

Kilifi- A coastal county has a mixture of rural and urban settings with cultural and geographic vulnerabilities associated with accessibility of newborn care. Kilifi county has an estimated total population of 1,453, 787 (KDHS, 2014).

Mombasa- A coastal peri-urban county has poor and informal settlements representative of socio-economic vulnerabilities with social and physical accessibility complexities. Mombasa County's population is approximated at 1,208 million people (KDHS, 2014).

Bungoma- This county represents a rural agrarian setting with physical accessibility and cultural vulnerabilities, typical of rural settings. Bungoma county has a population of 1,670, 570 people (KDHS, 2014).

3.3 Study Recruitment

Study mobilization and sensitization meetings was held with county health management teams and the county leadership in the four counties. In consultation with CHMT, two sub counties in each county were selected. CHMT selected six facilities in each sub county, based on consultations on gaps and challenges in young infant health, bringing the total of facilities in each county to twelve. In assessment of community perceptions and practices, table 2 below shows the targeted group and the inclusion criteria for each participant in each category. In the six-monthly follow-up cycles, 3 potential PSBI cases, 3 referred by CHVs, 3 provider interviews, and 3 CHVs were selected from each site. County context assessment was also conducted on changes made related to PSBI practices of caregivers, and frontline staff.

3.4 Sampling

The four counties were purposefully selected to reflect different barriers to newborn care in Kenya. They also provided contrasting scenarios in barriers to accessibility of care that apply in the various sub-populations as indicated by varying vulnerabilities in the selected sites. Two sub counties in each county and six facilities in each of the sub county were purposively selected in consultation with the individual county health managers to ensure the selection criteria was based on the facilities with critical vulnerabilities in young infant care provision. Participants in the IDIs and FGDs were selected using systematic random selection in consultation with the CHVs (in the case of caregivers).

Table 2: Summary of the study target group by sample size interviewed and criteria for inclusion

Study method	Target group/No.	Criteria for inclusion
In depth interviews(IDIs)/	3 IDIs with frontline providers	One provider from public health center, one from public dispensary and one in sub county hospital
County	3 IDIs with young mothers-15-18 years 3 IDIs with young mothers 18-24 years	Focus on women who have had hospitalization with a new born 0-59 days and or may have lost a new born
	2 FGDs with young mothers 15-18 years 2 FGDs with young mothers 19-24 years 2 FGDs with older mothers 25-45 years	Women with young infants 0-59 days of whom some may have been hospitalized for infection among the infants
Focus group discussions (FGDs)/County	1 FGD with active CHVs	Active CHVs linked to any of the project facilities between 6-8 people per FGD
	1 FGD with Married men	Married aged 35 years and above with young infants aged 0-59 days

3.5 Quality Assurance procedures and validity

The capacity assessment was conducted in scheduled forums with county managers and sub county managers where clarifications on the health systems were pursued and periodically entered in an electronic EXCEL capacity assessment tool. Before meeting

adjournment, completeness of data capture in all the 8 domains was ensured. Pretesting of the facility audit tool was carried out in a selected non-participatory facility in each county. The facility audit questionnaire was interviewer-administered; the researcher gave clear instructions to the participating facility managers on data reporting with clarity sought in case of incomplete data. Items in the questionnaire that may have had incomplete data were followed up for clarification. Throughout all stages of the study, data was stored in password protected computers, hard drives and flash drives to ensure confidentiality with accessibility limited to the researcher and research assistants. Quiet areas were used for the interviews and focus group discussions at the convenience of participants. During qualitative data collection, participants were interviewed in English and Kiswahili to facilitate understanding and accurate responses.

3.6 Data collection activities

Implementation research activities involved a formative context mapping and assessment using qualitative and quantitative methods. A capacity assessment of the four counties was conducted using standard frameworks and bottleneck analysis. This focused on individual and system level contexts addressing gaps and areas that required improvement to meet the needs of PSBI implementation and subsequent sale up. 12 facilities in each county were subjected to a facility capacity assessment audit looking at health systems building blocks that included infrastructure, documentation, records review, referral systems, staff trainings and resources available. Stakeholder and policy analysis was conducted to identify the existing stakeholders involved in newborn care as one of the priority areas of this study leveraged on combined efforts of all stakeholders in PSBI implementation, as well as policies influencing PSBI uptake. An assessment of PSBI trainings was conducted using a pre-developed tool to identify the number of staffs trained in PSBI related activities, the training institution and the trainings

conducted. Focus group discussions and in-depth interviews were used to assess community perceptions and practices regarding newborn care in the 4 counties. Case studies of CHVs and providers were conducted six monthly to inform changes needed for progress to be made in support of implementation of PSBI guidelines. This entailed case narratives on experiences, care seeking, understanding of demand-side barriers they've overcome, household decision making, determinants of care seeking in PSBI and acceptability of new PSBI approaches. Each follow up cycle explored the underlying determinants of change, including variations by setting or level of staff. This included staff opinions on feasibility and sustainability, care-giver attitudes and values, staff attitudes, values and quality of care in relation to sick young infants and their management. The cost implication of PSBI was assessed qualitatively where a bottom-up costing approach employed to estimate total and annual social costs.

3.7 Statistical analysis

County capacity assessment data collection was achieved using a pre-developed electronic excel tool with 8 functional areas of assessment. Quantitative data on the facility audit was collected using a facility audit questionnaire. The data was cleaned by reviewing the facility questionnaires at the end of each day so as to resolve (in consultation with facility managers) any errors, missing values and extreme values that may have been encountered. Quantitative data analysis entailed data entry using Microsoft Excel and inferential statistical analysis using STATA version 24. Numerical data with normal distribution was described using means and standard deviation while skewed data was presented using median and interquartile range. Inferential statistics effectuated multiple linear regression analysis essential in the estimation of the relationship between the continuous dependent variable and the independent variables, canonical correlation in the analysis of the strength of association between the two

constructs (outcomes of newborn care before and after PSBI (variables- day 4 and 8 follow up/linkage to CHVs), multivariate analysis of variance (MANOVA) for comparison of grouped independent variables and the dependent variables. Social costs and their implications were analyzed using qualitative methods and a bottom-up costing approach to estimate total and annual costs.

Qualitative data in audio recording was transcribed and translated in Microsoft word. Entry to NVIVO 11 followed, analysis involved initial development of a tentative thematic framework, a second iterative reading and updating of thematic framework, coding and recoding using NVIVO 11, charting process and presentation of results on key study implications.

3.8 Data reporting and dissemination

The findings were disseminated through continuous county/national dialogues and stakeholder forums. This was supplemented by circulation of printed materials in facilities participating in the study. Presentations with team members in the larger project were held to review emerging evidence and plan for incorporation of recommendations into health systems. Demand-side tools and regular training of key messages were introduced and embedded in the revised IMNCI program. Dissemination also involved peer-reviewed publications, presentation of key findings in local and international conferences.

3.9 Ethical considerations

The researcher sought approval from supervisors and school/departmental research defense panel. Ethical clearance was sought from Mount Kenya University Institutional Ethics Review Committee (IERC) and a research permit from National Commission for Science, Technology, and Innovation (NACOSTI). The study purpose was fully

explained to the participants prior to taking part in the study. A signed informed consent was sought from participants with assurance of confidentiality. Each participant was allowed to read, ask questions, and seek clarifications before signing the consent form and participating the study. No participant was victimized for lack of participation or withdrawal from the study. Those who chose to participate were duly informed of the risks involved and measures taken to prevent said risks.

3.10 Timelines and Funding

The study was part of a 3-year project funded by USAID on Scaling up PSBI Guidelines in Kenya through building confidence in the management of sepsis in young infants. The project was managed by Population council with MKU and KEPRECON playing key specific roles in the project.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Socio-Demographic Description of participants and capacity assessment

4.1.1 Health systems capacity assessment

The county and sub county health systems' capacity were assessed on their influence on service delivery for newborns. This was carried out within the devolved health system structures. The National Government through the Ministry of health continues to provide leadership and policy directive while the county health governments provide health service functions. Health care delivery is arranged around the seven Health Systems Building Blocks that include Service delivery, leadership and governance, Health Workforce, Health Financing, Health Products and Technologies, Health Information, Health Infrastructure.

Capacity results vital for advocacy, identification of county health weaknesses and strengths for effective service delivery, and to identify short and long-term capacity needs that can improve supply side bottlenecks. The assessment adopted a participatory and consultative approach where the county teams reflected on the health system building blocks. In each domain [Table 1], three dimensions were examined: **Status**: if a given element exists, such as a policy or legislation; **Quality**: if the element conforms to established quality norms and **Application**: the extent to which the element is executed. Key informants included key County and sub county management staff such as directors of health, chief officers of health or their designee, key program managers, heads of various departments and focal points for various service areas. Summaries of the data were shared with the CHMT during validation meetings. The overall scores for each component are displayed in the easy-to-interpret dashboards and spider plots. An overall organizational capacity index (OCI) was generated, and a summary of key gaps and action points are presented as recommendations to support scalability of PSBI.

Table 3: Summary of domains assessed

Domains	Focus of Questions
Health Financing & Policy	Policy formulation- development and adoption of National policies, Plans: county integrated development plans (CIDP), medium term expenditure framework (MTEF), Sector plans, Annual development plans (ADP), Annual work plans (AWP), Sector working group Budgeting: Circular, County Budget Review and Outlook Paper, Quarterly implementation reports, Audit reports, County Fiscal Strategy Paper, Program based budget, Revised estimates Budget execution and reporting: Procurement plan, cash flow forecast, financial reports, non-financial reports, Approval process (controller of budget), Timely reporting, quality of reports (content and structure), Use of integrated financial management information system (IFMIS)
Human Resource Capacity	Human Resource Policy/Plan/ County capacity to staff the county/sub-county/health facilities as per national HRH norms, guidelines and standards/ Employment database County capacity to strengthen staff performance management and supervision of existing workforce Ability to attract, recruit and retain health workers/Training and capacity development programme
Leadership and Governance	Leadership and Governance (political/leadership commitment, leadership capacity to meaningfully engage P&B process CMHT structures & functionality /Partnerships and stakeholder coordination
Health products and Technologies	Governance and Oversight /Commodity Security/ Logistics Management

Service Delivery	RMNCAH services provided/ Service Charters /Supportive Supervision process and system
	Quality Improvement processes/ Referral system /Community facility Linkages and strategy
	Health Infrastructure requirements (includes medical equipment, emergency response system, buildings, technologies)
Health Infrastructure	Strategy: Health infrastructure policies and standards as per MoH /Infrastructure Development & Execution /Budgetary allocation, Procurement plans, leasing arrangements (Public private partnership (PPP) & innovations)
Health Information System	Routine Data collection strategy/ Essential tool and equipment for data management (e.g. collection, transfer, storage, analysis) /Guidelines to document procedures for collecting, recording, collating and reporting routine program data
Monitoring and Evaluation (M&E)	M&E unit/focal person /An inventory/database for program evaluation /Forums for dissemination and discussion of evaluation findings

In-depth Interviews with providers and young mothers

37 In-depth interviews were conducted with young mothers aged 15-18 years, 19-24 years, providers, and facility managers. Women were purposively selected based on age; residency in the project site and with newborns. Women were interviewed in Kiswahili or local languages by research assistants with training in qualitative data collection using a guide. Information captured included the process and challenges of managing sick newborns, care-seeking patterns for sick infants and structures necessary to strengthen PSBI at the community level. We also interviewed providers to examine facility level perceptions of care for sick newborn and challenges faced during service delivery.

4.1.2 Focus Group Discussions with Community Health Volunteers and women

A total of 39 focus group discussions (FGDs) were conducted (Table 4). We included married men to examine decision making issues and their role in childbirth and care of newborn as well as CHVs. The aim was to understand newborn care practices, care seeking patterns for newborn and implications for PSBI. We explored perceptions of treatment for young infants with or without referrals, the health system responsiveness of their needs and community facility linkages. The men FGD focused on their role in influencing care seeking practices for their partners and infants, their understanding of care needed for sick infants. Each FGD was facilitated by experienced research assistants with training in qualitative data collection. The discussions were conducted in Kiswahili or local language, held in convenient locations to most members and were audio-recorded with the consent of participants.

Table 4: Distribution of qualitative data collection by site

Category of method/participants (Demographics)	County D	County C	County B	County A	Total number of participants per data collection time
IDI Very young mothers (15-18 years)	2	4	3	2	11
IDI young mothers (19-24 years)	3	2	3	4	12
IDI with Providers & facility managers	2	2	3	7	14
FGD Very young mothers (15-18 years)	2	1	2	2	7
FGD young mothers (19-24 years)	3	3	2	4	12
FGD Older mothers (25-45 years)	1	1	2	2	6
FGD married men (>35 years)	2	2	1	2	7
FGD with active CHVs	2	2	1	2	7

4.1.3 Characteristics of facilities

48 health facilities were assessed spread across the four counties, 12 facilities per county and 6 facilities per each sub county: 12 hospitals, 18 health centers, and 18 dispensaries. Out the 48 facilities, 43 were government facilities/public facilities and 5 were faith-based health facilities (figure 2).

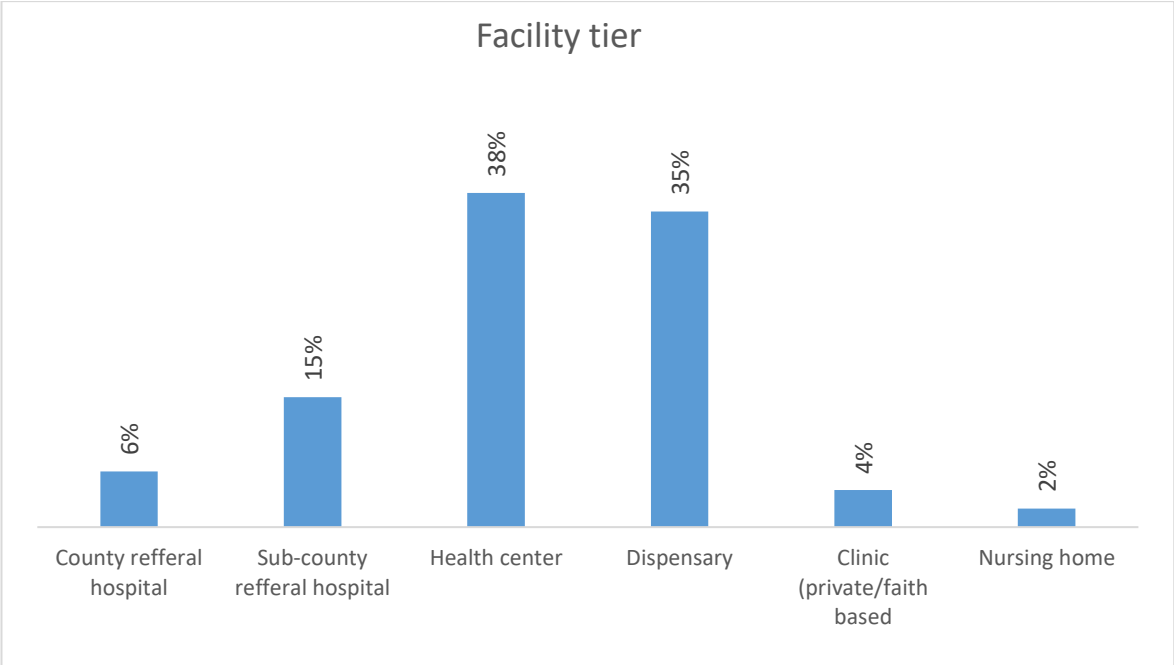


Figure 2: Facilities tier

Three facility tiers (County, Sub County and community/health centers/Dispensaries/Clinics) types were involved in the study according to the Kenya Health Policy, 2014-2030 (MoH, 2014). Overall, majority of the selected facilities were under tier 2 with Health centers at 38% and Dispensaries at 35% respectively. Other facility types that took part included 6% county referral hospitals (which were the four county referral hospitals in the four representative counties). 15% of the total number of 48 facilities were Sub County referral hospitals while clinics and Nursing homes had a cumulative of 6% facilities taking part. Regarding hours of operation, most facilities in Bungoma county offered services for 24 hours, 7 days a week except 5 dispensaries. 3 of these dispensaries operated Monday-Friday, 8am to 5pm and 2 dispensaries operated Monday-Saturday 8am to 5pm. In Kilifi, all hospitals and health centers offered 24-hour services while dispensaries were open Monday to Friday between 8am and 5pm. Turkana County had 11 of the 12 facilities offering 24-hour health services with the one facility opening Monday to Friday between 8am an 5pm. In Mombasa County, 2

hospitals and 3 health centers operated for 24 hours throughout the week. 3 health centers and 2 dispensaries operated Monday to Friday, 8am to 5pm.

4.2 To assess the county health systems gaps and facilitators in the management of PSBI, with and without referral, in selected counties in Kenya

4.2.1 Health systems capacity assessment

Merging integration analysis using convergent approach of quantitative and qualitative data was used to generate an overall organizational capacity index (OCI). This assisted in understanding the interface of the two data types and drawing of inferences. Descriptive summaries from qualitative data were triangulated with quantitative summaries and results represented using a theme-by-statistics display. The organizational capacity index (OCI) was derived by calculating average scores in each capacity area against the total possible scores generating a percentage. The overall grading score was green if the counties scored 70% and above, amber for scores between 50-69%, and red for scores below 50%. All counties scored amber: Bungoma and Turkana scoring 61% while Mombasa and Kilifi scored 64%, as shown in Figure 3.

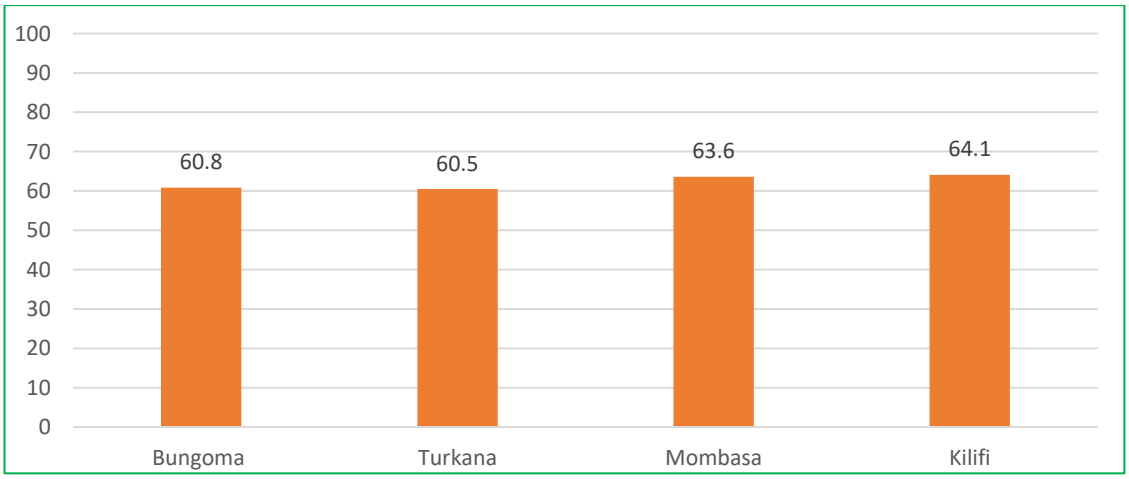


Figure 3: Organizational capacity index for all counties

For each domain, the highest score was in HMIS with an average score of 70% across counties and service delivery domain where Turkana, Mombasa and Kilifi scored a

green, but Bungoma scored amber of 65% (Table 5). The lowest scores were in monitoring and evaluation (M&E) where Bungoma and Turkana scored red while the rest scored amber. Counties scored relatively low scores in human resources for health and health products and commodities with Turkana scoring red for both areas while the rest scored amber. The rest of the domains scored amber of between 51-65%.

Table 5: Scores by health system domains

OCI	Bungoma	Turkana	Mombasa	Kilifi
Health Policy and Financing	69.5	64.8	68.6	66.7
Leadership and Governance	53.8	53.8	54.5	61.3
Human Resources for Health	54.5	48.5	57.6	60.6
Health Products and Technologies	61.1	41.7	55.6	62.5
Service delivery	67.1	71.3	74.3	70.7
Infrastructure	65	51.1	53.3	53.3
HMIS	70	72.5	80	70
M&E	40	49.1	50.9	54.5
Key	Status	Score	Action needed	
<=50	Red	Poor	Extensive support	
51-69	Amber	Average	Medium level support	
>=70	Green	Good	Minimal support	

Source Field Data(2021)

Figures 4-7 show the overall scores per domain in term of status, quality, and application in form of spider webs. Health policy and planning domain scored amber for status and quality across sites with Kilifi scoring a green for the application dimension. In terms of leadership and governance, all counties scored amber for status and quality except Turkana that scored a red for quality. All counties scored a red for the application dimension in this domain.

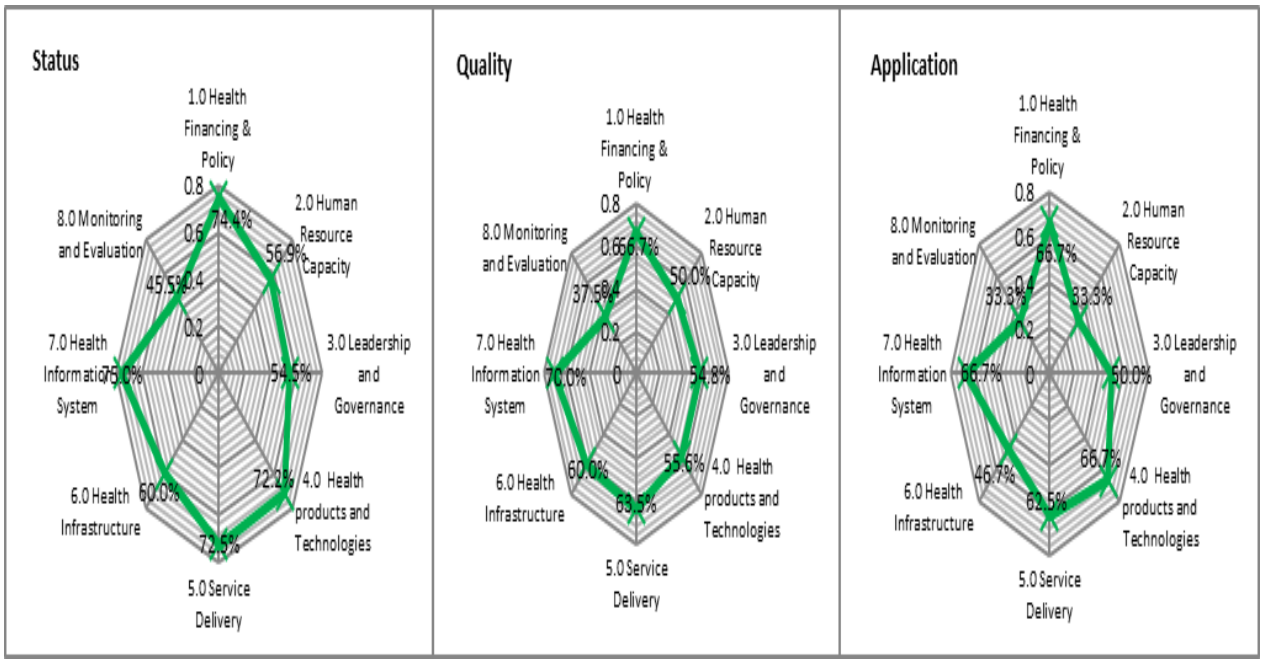


Figure 4: Scores by dimension of assessment (Bungoma)

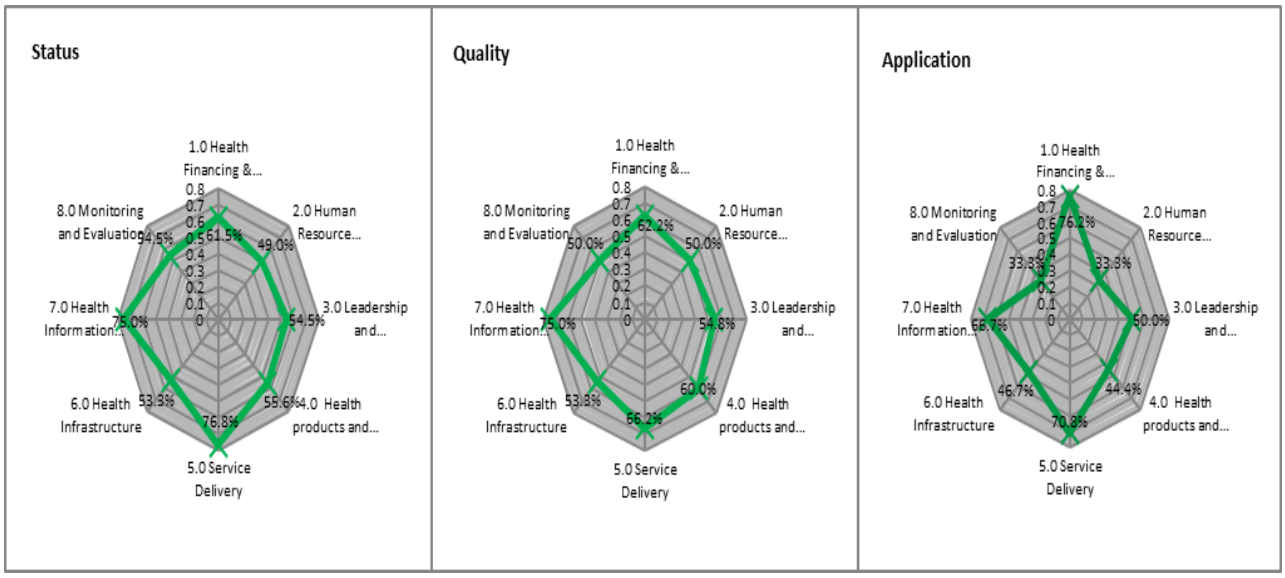


Figure 5: Scores by dimension of assessment (Turkana)

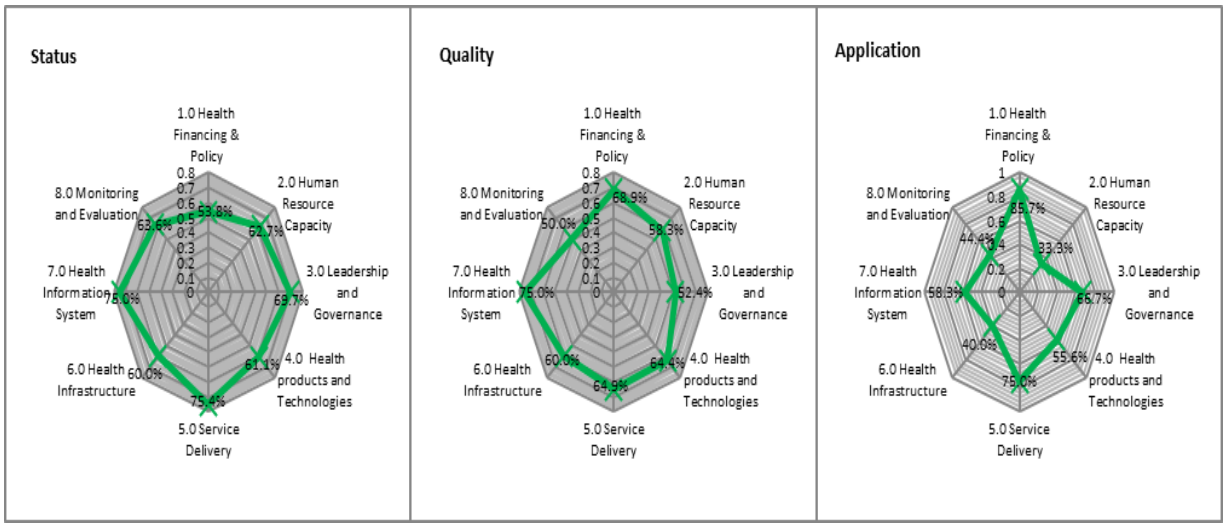


Figure 6: Scores by dimension of assessment (Kilifi)

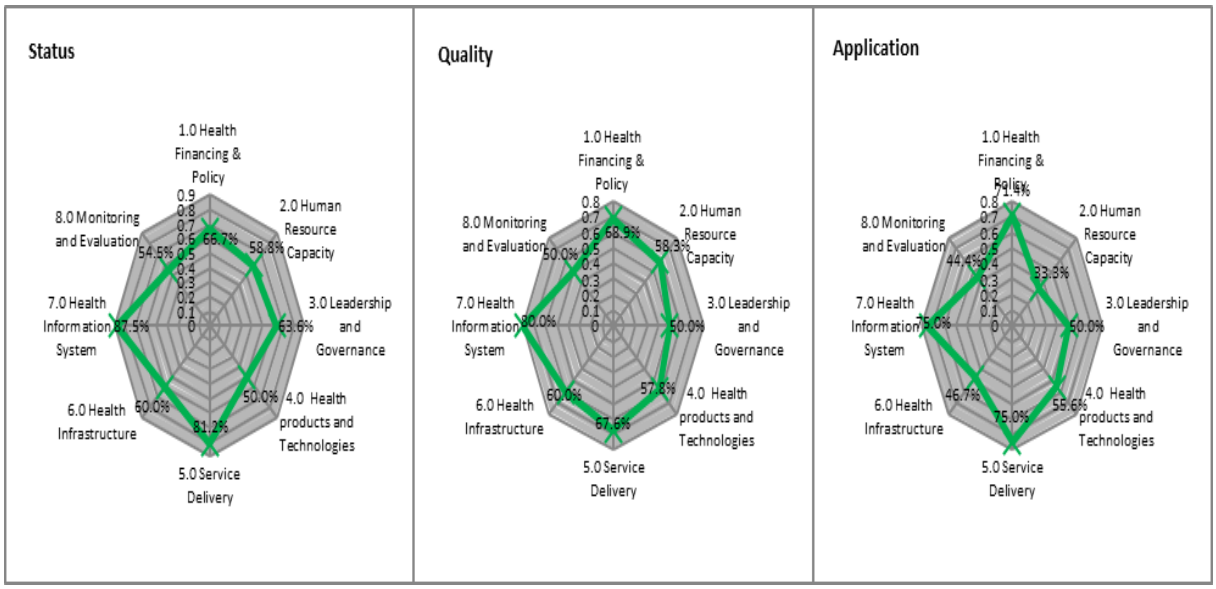


Figure 7: Scores by dimension of assessment (Mombasa)

Regarding human resources for health all counties scored amber for the three dimensions except Kilifi that scored a red for the application dimension. For health products and commodities, Bungoma scored green in the status dimension, the rest scored amber for all dimensions except Turkana that scored red for the application dimension. Despite the challenges of infrastructure, there was an observation that service delivery area was still functional albeit with sub optimal quality of services. Good scores were reported for the status dimension with all counties scoring green and

amber for quality. Turkana and Kilifi scored a green for the application dimension while the rest of domains scored amber.

HMIS scored green for status and quality for all counties but amber for application in Bungoma, Turkana and Kilifi, the latter being linked to the challenges of availability of tools for documentation, reporting process and data quality. Monitoring and evaluation was the domain that scored low for all dimensions; Bungoma scored red for three dimensions, the rest scored amber for status and quality.

Gaps and challenges in health domains

This section provides a synthesis of the eight domains and provides a narrative behind the scores and generic reflections are drawn for recommendation per domain.

4.2.2 Health financing: Policy, planning, budgeting, and budget execution

All counties scored amber for this domain. This means that policies, plans, structures, and systems are slowly shaping but not well functionalized.

Counties suffer from several challenges including:

i. *Gaps in Policy formulation and strategies to support financing process*-due to capacity gaps and lack of ownership to generate county appropriate strategies to improve accountability.

ii. *Inadequate application of formal planning framework during the planning process* - leading to dis-linkages between work plans, budgets, cash flow; poor or irregular disbursement from the county treasury due to centralization of departmental financial functions and skills gaps in understanding the budgeting cycles and legal requirements.

iii. *Limited understanding of the planning and budgeting process*, -this includes structures, timelines and areas of input and the nexus between the Annual work Plans (AWPs), annual development plans (ADPs), County integrated development

plans (CIDP) and program-based budgeting (PBB).

iv. *Inadequate capacities to develop sound and credible PBB budgets* and Plans e.g., AWPs coupled with lack of feedback on PBB expectations especially at sub county levels;

v. *Lack of effective prioritization process in the budgeting cycle limiting funds to health sector*- Ineffective prioritization is due to inadequate use of health indicators during policy formulation leading to inadequate funding for health sector competing with other development areas.

vi. *Chronic health sector underfunding* -affecting ability to implement activities as per AWP.

vii. *Delays in receiving funds from county treasury or other programs such as Linda Mama program* – partly due to challenges with approval process to access funds, delays in reimbursements and inadequate communication on cash flow forecasts by finance department.

viii. *Limited involvement of key stakeholders in policy development planning and budgeting*-Partly due to lack of funds to host stakeholder's forum, lack of structures and forums (or the presence of weak ones) to involve stakeholders, as well as a lack of understanding by the CHMT on the policy and planning development framework that requires involvement of stakeholders to ensure development of broad-based health policies and plans, furthers exacerbates the challenges.

ix. *Low budget execution*- Due to difficulties in budgeting and accessing funds from the county Treasury. The county Treasury hardly receives funds on time from the national treasury, and even when funds are received, the County Treasury officials do not communicate to the CHMT. This is due to the pressures of multiple, high-priority, sectoral budget line items and scarce resources. While cash flow forecasts

are developed by the health sector accounts officer monthly, they are almost always not met because revenue collection is unpredictable and equitable share transfers from the national government are irregular. Furthermore, departmental heads within the health department are not Authority to Incur Expenditure (AIE) holders and are often unaware of their budget allocations. Thus, they cannot effectively execute and track their respective budget allocations. These issues are summarized in Table 12 with the potential recommendations for action.

4.2.3 Leadership and Governance

Good leadership and governance play a vital role in the creation and pursuit of a shared vision for the health system.

Key gaps are discussed below:

i. *Lack of a clear organogram outlining roles and responsibilities of the CHMT.* Most counties do not have a clear organogram. As a result, relative roles and responsibilities are unknown. In some cases, an organogram existed but it's not updated or used for lower staff cadres.

ii. *Lack of structured training of health leadership at all levels.* There is no structured training of health leadership teams including orientation for new CHMT and SCHMT members. There is no framework that works with the County Public Service Board for clear contractual arrangements for the CHMT.

iii. *Sup-optimal Functionality of CHMTs and SCHMTs*. Their functionality was sub-optimal with limited performance management and review structures. Additionally, the CHMTs lack the resources and capacity to mentor, facilitate and build capacity of sector players. There was no evidence of a capacity-building plan to strengthen the CHMT and ensure effective sector oversight, coordination, supervision and monitoring.

iv. *Weak public-private partnership structures in place and coordination.* Characterized with unclear communication strategies. There is no clear county level structure, or a health department specific structure to manage private sector or other implementing partners. In general, counties do not have relevant personnel however for any new partner supporting the county health system a memorandum of understanding agreement is normally signed between the partner and county. Others do not have a framework by which donors can plug in their support frameworks so oftentimes the County is beholden to the support provided through donors.

4.2.4 Human resources for health

Human resources for health (HRH) constitute persons recruited for health and related service provision and management. Almost all counties reported limited capacity in delivering adequate HRH.

Key gaps are discussed below:

i. *Weak HR governance structures.* Counties have varying human resource structures, with different levels of staff. Most counties lack an HRH strategic plan to link the human resource management and the development planning, staffing plans, appropriate remuneration, affirmative action on gender, recruitment, training, and staff performance. Most counties do not have human resource units in place. Where units exist, individuals with HRH backgrounds need additional support to manage tasks. Some units have assigned a data clerk who undertakes the function but are often not formally trained and lack technical competence to deliver the HRH mandate. There is no adequate budget line for human resource management.

ii. *Limited capacity to implement HRH functions*. Counties have limited capacity to implement HRH functions as exhibited by lack of harmonization of county health staff, challenges of effective supervision of health workers. This is compounded by

lack of clear job descriptions relative to county health operations, other than technical job descriptions pertaining to their skills.

iii. *Lack of effective implementation of a digital system, or integrated human resources information system (IHRIS), for monitoring and tracking health workers.* Kenya has the IHRIS, which is meant to support monitoring and tracking of all health workers in the country. However, not all counties have adopted IHRIS, and even where IHRIS is applied, its functionality is sub-optimal. In counties where there is an IHRIS to track staffing needs, it is not regularly updated and has limited IT equipment. As such, there is not accurate data on how many staff are working in the county.

iv. *Limited capacity to strengthen staff performance management and supervision of existing workforce.* All the counties are aware of a national strategy and tool for staff performance management and supervision; however, it is not being used effectively. There are no systems for rewards or sanctions. Informally, the health facility in-charges are aware of staff performance but there is no formal mechanism for feedback.

v. *Weak training and capacity development program.* In almost all the counties assessed, there lacks an effective training needs assessments strategy or coordination of in-service and pre-service training. In addition, counties also experience inequitable distribution of training opportunities. There is no electronic database to track identified staff needs, which results in haphazard record keeping.

4.2.5 Health products and technologies

Health products and technologies (HPTs) is a critical component for any health system to function optimally.

Key gaps are discussed below:

i. *Weak governance structures for HPT.* HPT units playing a central role in planning, monitoring, and reporting of commodities. However, governance structures for HPT are weak in most counties, and where they exist, their functionality is sub-optimal. In the absence of HPT units, the supply chain systems in most counties are fragmented. At the county and sub-county levels, the pharmacist is responsible for the management of essential medicines and medical supplies (procured from the Kenya Medical Supplies Authority), the Medical Laboratory Coordinator manages laboratory supplies and reagents among others, while family planning, malaria, TB and HIV/AIDS commodities are managed by the respective program coordinators. There is little coordination between the coordinators, leading to duplication of efforts and resources. The Kenya National Pharmaceutical Policy requires counties to establish Medicine and Therapeutic Committees to provide broad guidance on medicines use, including selection of medicines. These Medicine and Therapeutic Committees hardly exist or function effectively. This is largely due to the lack of human resources to oversee the HPT system, including functionalization of county commodity security committee, especially at sub county level.

ii. *Limited capacity for commodity forecasting and quantification*. Generally, counties have limited capacity in commodity forecasting and quantification including formal documentation for forecasting and quantification and no standardized method is currently utilized. Where forecasting and quantification exist, it is largely based on historical consumption. Most county health facilities provide average monthly consumption data which is relayed to the sub-county and county level. The data is then aggregated, generating consumption patterns for the county order to be placed to KEMSA (as first choice) and Mission for Essential Drugs Supply (MEDS) (as second choice after KEMSA).

iii. *Poor physical infrastructure for commodities, weak inventory management and storage practices*. With a lean commodity team, the counties suffer from inadequate ability to manage the commodity system. Storage of commodities is limited to inadequate stores within the counties and the storage conditions that exist are poor and not aligned with good storage practices such as, appropriate temperature, controlling lighting and ventilation, safety, pallets for bulk products and proper stock management. At the facility level, counties experience issues of poor shelving and storage.

iv. *Limited use of the Logistics Management Information System (LMIS) and use of supply chains data for decision making*. Counties use the LMIS to place and track orders to KEMSA but monitoring of commodities is largely manual. This means that there is limited use of supply chain data analytics and usage for decision making. Furthermore, counties do not adequately use commodity supply chain statistics for improved planning and budgeting for HPTs.

v. *Weak supervision (or none) for monitoring, inventory management and re-distribution of commodities*. This is also challenged by the inadequate process of disposal of expired, obsolete commodities as per disposal guidelines.

4.2.6 Service delivery

Service delivery function reflects the interaction between the health system and clients. Key gaps are discussed below and presented in Table 16:

i. *Inadequate dissemination of guidelines and documentation of newborn care.* In all counties, most facilities provide services in accordance with the Kenya Essential Package for Health (KEPH) by level of care. The major gap is in the provision of newborn care. Counties lack adequate resources and equipment to support newborn units, have gaps in updates and training of providers which limit service provision. As much as possible, counties provide services in line with national policies, standards, guidelines and manuals. However, their dissemination remains a major challenge. While some training has been done in specific areas, such as CEmONC and BEmONC services, due to high staff turnover, it has limited effectiveness. Facilities have at least one nurse and some have two; those with few nurses may have services disrupted, but there are adaptations where CHVs support the nursing services in defaulter tracing, recording and documentation of clients. In some places, the counties are renovating facilities, but limitations of funding affect expansion of infrastructure.

ii. *Service charters exist in most facilities, but these are not actualized.* All counties have in place a service charter system to institutionalize accountability process. Most facilities have well-displayed service and patient rights charters displayed in strategic locations but does not provide mechanisms of communicating problems and complaints that clients experience.

iii. *Weak supportive supervision structures and process.* One crucial area that lags in the counties is inadequacies in the supportive supervision process and structures. This is because the county planning and budgeting process often does not get a

budget line for this task. With an exception of cases where donors support certain programmes, the counties are often left at the mercy of such programmes to realise supervision activities.

iv. *Non-functional referral system*. Some counties have developed a referral strategy like Turkana, but others do not have a county referral coordinating unit. Effective referral strategies have not been operationalized meaning that the standardized referral tools are not always available and used. Some counties do not always have transport structure for referrals.

v. *Lack of a comprehensive quality improvement implementation strategy.* Although nearly all counties have a quality-of-care strategy and a localised unit in place, with a coordinator at the county level and structures at sub-county level, they lack an active comprehensive quality improvement implementation strategy. There are challenges of operationalizing the QIT fully as resources are not often available. To operationalize the quality teams at lower levels, the quality-of-care sub-committees exists in hospitals; but their functionality is sub-optimal.

vi. *Limited implementation of the community health strategy.* Although the coverage is limited, the community units have CHVs trained by different partners. However, the greatest set back is budget to support the community units, tools, and referral booklets for reporting. Counties like Turkana have had legislation passed to fund the community strategy, but not realised.

4.2.7 Health Infrastructure

Health infrastructure consists of all the physical infrastructure, non-medical equipment, transport, and technology infrastructure (including ICT) required for effective delivery of health services. Practically, health infrastructure remains the greatest bottleneck to

delivery of quality health services and the overall functioning of the county health system.

Key gaps are discussed below:

i. *Non-existence of health infrastructure policies and standards.* Most counties do not have a strategic policy for health infrastructure development and maintenance, nor any known master plans or designs for existing or planned infrastructure growth. In most counties, nearly all the health facilities at various levels have no adequate standard equipment and infrastructure, as per norms and standards. There is disjointed development of infrastructure that requires huge resources to operationalize at expense of basic equipment for service delivery.

ii. *Weak health infrastructure maintenance systems*. In all counties, there exists a health maintenance unit which doubles as the infrastructure unit and coordinates maintenance requirements for the county and major hospitals. Public health officers, maintenance officers and biomedical engineers are present to coordinate maintenance, however their capacity to maintain infrastructure as per the norms and standards is weak.

iii. *Limited engagement in procurement of medical equipment and unclear linkages with the Department of Public Works.* Procurement of medical equipment is done through the county procurement units. However, the procurement of medical equipment is challenged by no proper procurement process being adhered to; the health department is not involved in the evaluation of the equipment tenders and there lacks proper inspection committees in place to verify deliveries. In terms of construction, there are no clear links or connection with the Department of Public Works.

iv. *Lack of an effective system for infrastructure development and execution framework.*

Counties have not established effective system for infrastructure development and execution framework. Additionally, counties hardly keep registers for county assets, and it is difficult to know what assets and their state at various levels of the health system.

Health information system

HMIS is a critical component of a functioning health system and includes a set of interrelated components that collect, process, store, retrieve and distribute information to support planning and decision making within the health system. The systems can be computer based or manual.

Key gaps are discussed below:

i. *Fragmented data collection and limited capacity to collect quality data.* Counties have a system for routine information gathering in place. However, the data collection and management system, data quality and analysis and use or application of the data for decision-making was found to be sub-optimal. This is due to unavailability of data collection and reporting tools at the point of use and, in some instances, the lack of enabling ICT infrastructure and equipment, including computers. The system is further limited by inadequate human resource capacity at the point of use, affecting the timeliness, reliability, accuracy, completeness, and overall quality of data collected and fed into the DHIS2 system. Data collectors are overburdened by excessive data and reporting demands from multiple and poorly coordinated sub-systems. The community level data is collected by CHVs, community health committees and CHEWs but is rarely entered into DHIS2. There is limited capacity for data quality assurance and audits at various county levels due to lack of county guidelines and systematic data processes and data collectors' lack of capacity

and demanding workload.

ii. *Lack of regular data analysis and use of data for decision making.* Counties have limited capacity to turn analyzed data into knowledge products to inform decision-making. There were no data demand and use structures in place, and there was an assumption that raw data can be used for decision-making. Most CHMT members have limited knowledge of the existing tools at the point of use. Limited data demand and use was attributed to a lack of a culture of evidence-based decision- making. Quarterly data reviews are also not regularly carried out due to budgetary constraints.

iii. *Inadequate equipment and infrastructure to support HMIS*. There lacks essential ICT infrastructure and equipment, including computers, smart phones, and reliable internet connectivity to effectively support data collection, storage, management, retrieval, transfer, and reporting functions. Most facility and community data management systems use hard copy registers to manually extract data.

Monitoring and evaluation

Monitoring and evaluation (M&E) is a critical component of the health system. M&E assesses the performance of health projects, institutions, and programmes in relation to what was planned and the achievement of outputs, outcomes, and impacts. The goal of the M&E system is to help improve health system performance and therefore lead to the achievement of the desired results. The M&E function is not well established at the county level.

Key gaps are discussed below:

i. *Lack of M&E policies, frameworks, and organizational structure.* In almost all counties, the CHDs do not have specific strategic policies, frameworks, or

organizational structures to lead and operationalize M&E functions. There are often no M&E unit or focal person and where a team exists, the unit is inactive and does not easily meet due to other responsibilities or it exists as part of the CHMT. In general, there are no links between the strategic plan and M&E plans since it there are no tracking systems for health system performance or tools to track M&E indicators.

ii. *Limited capacity to translate data into policy and practice.* Counties lack inventories for all relevant evaluations or research conducted in the counties. Where these exist, they are programme specific, and donor funded. In general, there is no capacity in translating the data and research into policy and practice. Additionally, counties do not have effective forums for dissemination and discussion of evaluation findings, except at the CHMT level, nor do they have a clear way of developing information products to key stakeholders. Major capacity gaps in operational research and program evaluation systems exist, including lack of capacity to produce and disseminate credible and quality information to support evidence-based planning and decision making, ensure that feedback is provided throughout the health system to improve performance, accountability, service delivery, program implementation and practice, motivate demand and use of data or information at various levels of the health system and promote knowledge exchange and learning among stakeholders within the health system and sector.

Discussion on health systems organizational capacity assessment

The four counties revealed varying levels of organizational capacity to effectively manage SYIs with PSBI. This has implications on the ability of these Counties to implement the 2015 WHO Guidelines on management of PSBI where referral is not

feasible. To enhance the capacity and fill gaps on the domains, the following steps are recommended.

i. Increasing partner coordination to better leverage the available resources for MNCH especially for SYI.
ii. Building provider capacity through mentorship or OJT or online virtual training as appropriate
iii. Encouraging site-exchange visits for learning especially for sites that do not have providers trained in IMNCI and enhanced overall funding for newborn health.

Health providers have shown motivation in the use of skills learnt in training initiatives to address work-related challenges as opined by Pfeiffer et al. (2019) in a study on building health systems capacity to improve maternal and newborn care in Ghana. To facilitate the 4th and 8th day follow up and improve care seeking behaviors and decision support, there is need to conduct training/ or updates of CHVs on IMNCI, support supervision, and focus on their role in follow up for PSBI cases among other newborn illness. Continuous capacity building and support supervision are main-stream interventions aimed at improving health systems' environment (Goyet et al., 2019). Sacks et al. (2019) makes a case for the integration of community health in national health systems going beyond the building blocks and promoting prioritization and investment in community health. This indicates the pivotal importance of the community health system in service delivery.

Supply chain management is a critical component in ensuring availability of needed commodities such as dispersible Amoxicillin tablets, gentamicin and associated non-pharmaceutical goods such as syringes and needles. The accessibility, availability and effective utilization of essential medicines plays a critical role in delivery of quality

health services (Ayah et al., 2020). To increase efficiency and reduce stock out, training providers on commodity/ logistics management and enhancing support supervision to support primary level health care providers on forecasting for IMNCI commodities among others will ensure timely/consistent procurement and distribution of antibiotics for SYI. Additionally, using the Laboratory Management Information System to improve reporting rate and decision making will enhance prompt care and utilization of services.

Newborn infrastructure was a key challenge for the counties with most facilities lacking dedicated spaces for newborn care and requisite equipment such as phototherapy machines, incubators, warmers and resuscitaires. An important contributor to this was low level funding for newborn services and inadequate support supervision to ensure maintenance and repairs were executed in time. This is reiterated by reiterated by Ayah et al. (2020) and Barugahare & Lie. (2015) that highlighted inadequate funding and poor priority setting as key challenges in MNH service delivery. Thus, Counties need to improve supervision for maintenance of MNH infrastructure as per norms and standards. This will ensure timely repairs and prevent further damage. Systematic supervision employing the use of clearly defined, quantifiable indicators has shown evidence of improved service delivery with modest budgetary implications (Loevinsohn et al., 1995). Budgetary advocacy to increase allocations for optimal infrastructure and service delivery and ensure adherence to IMNCI guidelines implementation.

Ensuring availability of staff over the weekend in primary health facilities for PSBI follow up on days 4 and 8 advocacy to county, sub county and national governments for prioritization of IMNCI services and provision of requisite resources will fill financial and commodity gaps for IMNCI. Studies have identified staff shortage and retention

related issues as important barriers to provision of quality care in MNH (Nair et al., 2014; Bhutta et al., 2008).

On M&E, it was evident that data on how SYIs are managed is not systematically available for monitoring progress; Indicators for SYIs are not overtly identifiable in existing HMIS data tool; There was weak documentation in the PNC registers including incompletely filled data in some of the columns in the register due to lack of understanding or inadequate information on the type of data required to be filled; and reporting is not undertaken on a timely basis limiting routine data for decision making on MNH service delivery. These challenges were contributed mainly by shortage of tools and registers in the county and routine data quality checks are not optimally functionalized. To mitigate these, the Counties will need to adopt and use HMIS SYI registers for documenting of PSBI care and conduct support supervision to enhance routine SYIs data entry/recording and reporting.

Facility preparedness and service delivery

From the monitoring data, the conclusion drawn was that most of Government run facilities were incapable of identifying SYI and treating them promptly. All tier 3 and tier 2 facilities reported to have postnatal rooms. 33% indicated that all their postnatal rooms were being shared by different consultation services. 33% of the county referral hospitals had the highest number of shared consultation rooms cumulatively while 70% of all facilities reported to have a room in their facilities that were shared with postnatal. (Table 6).

Table 6: Number of Shared postnatal consultation rooms:

Number	*County Referral Hospital*		*Sub-county hospital*		*Health center*		*Dispensary*		*Clinic (private/faith based)*		*Nursing home*		*Total*	
	3	*%*	7	*%*	18	*%*	17	*%*	2	*%*	1	*%*	48	*%*
0	1	33.3	2	28.6	4	22.20	5	29.40	0	0.00	0	0.00	12	25.00
1	1	33.3	5	71.4	14	77.80	12	70.60	2	100.00	0	0.00	34	70.80
3	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	1	2.10
4	1	33.3	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	2.10

Source Field Data (2021)

Table 7: Functional delivery beds

couches	**county referral hospital**		**sub-county hospital**		**health center**		**dispensary**		**clinic (private/faith based)**		**nursing home**		**total**	
	3	**%**	**7**	**%**	**17**	**%**	**17**	**%**	**2**	**%**	**1**	**%**	**47**	**%**
0	0	0.0	0	0.0	5	29.4	5	29.4	1	50.0	0	(0.0)	11	23.4
1	1	33.3	7	100.0	12	70.6	12	70.6	1	50.0	0	(0.0)	33	70.2
2	2	66.7	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	3	6.4

Source Field Data (2021)

Averagely, 70.2% of the facilities reported to have at least 1 functional delivery couch, with County referral and Nursing home reported to have 2 functional couches. 23.4% did not have a delivery couch (Table 7).

Table 8: Functional newborn unit/space/area/(for children 0-28 days)

County Referral Hospital		*Sub-county hospital*		*Health center*		*Dispensary*		*Clinic (private/faith based)*		*Nursing home*		*Total*	
3	**%**	**7**	**%**	18	**%**	17	**%**	2	**%**	1	**%**	48	**%**
3	100.0	3	42.9	6	33.3	1	5.9	1	50.0	0	0.0	14	29.2

Source Field Data(2021)

Only 29.2% of the facilities reported having a functional newborn unit/area for neonates (Table 8). All county referral facilities and 42.9% of Sub County facilities reporting to have a functional newborn unit. Data from the facility observation checklist however contravened facility reports with Sub County facilities having a functional newborn space reported at 27.3%. More than 90% of the facilities had provided shades and seats at OPD waiting area. MCH-FP also provided adequate privacy during examination at ANC/PNC OPD and MCH clinics. 14.9% had standard operating procedures for managing emergency for infants in place.

Facilities were asked to provide information of existence and functionality for different maternal, neonatal and child health elements in the facility. County referral hospitals had functional elements, except for Kangaroo mother care (KMC) beds, whereby only 33.3% had the KMC beds. Majority of the facilities had functional maternity units and delivery rooms at 82.6% and 80.4 respectively. Critical MNCH support services were lacking in most facilities; kangaroo mother care, functional newborn space, and a functional pediatric unit all at 26.1%. (Table 9).

Table 9: Existing and functionality of maternal, neonatal, and child health elements

	County Referral Hospital		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
	3	**%**	7	**%**	18	**%**	15	**%**	2	**%**	1	**%**	46	**%**
Functional maternity unit(combining antenatal, labor,	3	100.0	7	100.0	15	83.3	11	73.3	1	50.0	1	100.0	38	82.6
Functional delivery room (meets basic standards for delivery)	3	100.0	7	100.0	15	83.3	10	66.7	1	50.0	1	100.0	37	80.4
Functional operating theatre (meets basic standards)	3	100.0	5	71.4	0	0.0	0	0.0	1	50.0	0	0.0	9	19.6
Functional postnatal ward (with post natal beds and meets basic standards	3	100.0	6	85.7	12	66.7	3	20.0	0	0.0	1	100.0	25	54.3
Functional kangaroo mother care beds (in postnatal ward)	1	33.3	5	71.4	6	33.3	0	0.0	0	0.0	0	0.0	12	26.1
Functional nursery space	3	100.0	3	42.9	4	22.2	1	6.7	1	50.0	0	0.0	12	26.1
Functional pediatric unit (all children	3	100.0	4	57.1	3	16.7	1	6.7	1	50.0	0	0.0	12	26.1

including newborns)														
Newborn resuscitation space/table	3	100.0	7	100.0	12	66.7	4	26.7	1	50.0	1	100.0	28	60.9
Functional blood bank/storage	3	100.0	2	28.6	0	0.0	0	0.0	0	0.0	0	0.0	5	10.9
Functional Laboratory (meets basic standards)	3	100.0	7	100.0	16	88.9	7	46.7	2	100.0	1	100.0	36	78.3
Customer care desk/reception desk	3	100.0	7	100.0	11	61.1	4	26.7	1	50.0	1	100.0	27	58.7

Source Field Data(2021)

The functionality of various maternal and neonatal elements influencing the implementation of PSBI guidelines in primary health care facilities (health centers and dispensaries) in the four counties is represented by figure 8 and 9 shown below.

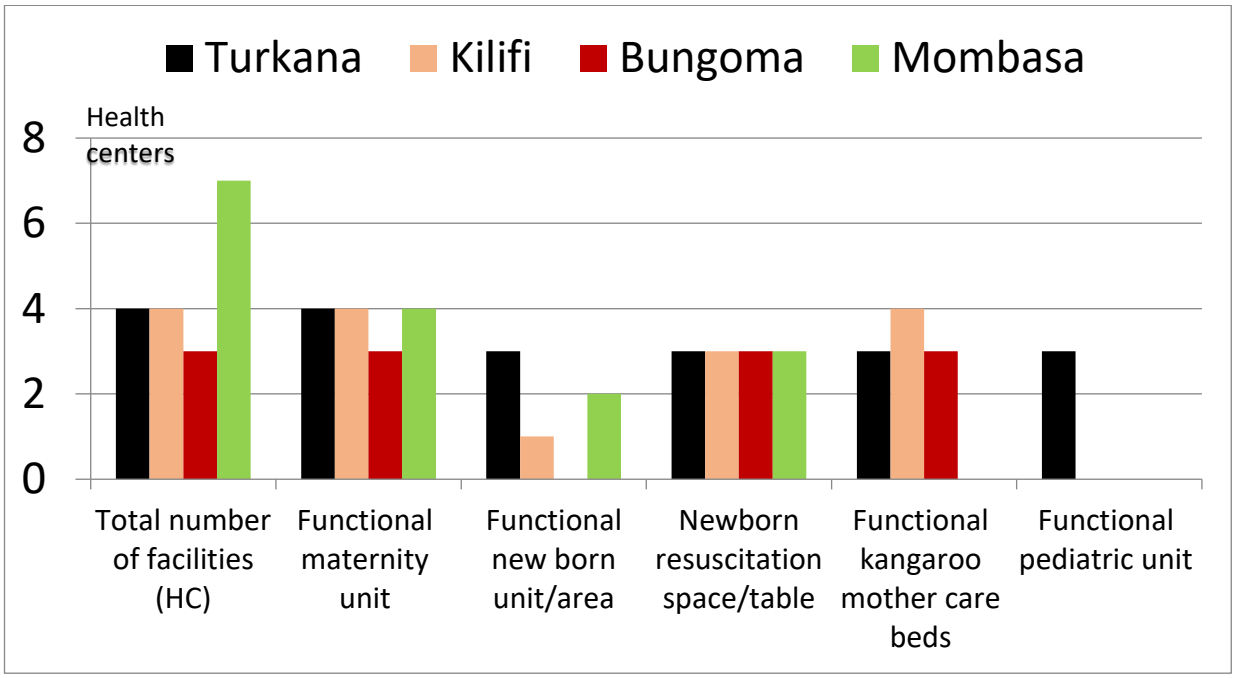


Figure 8: Functionality of health centers

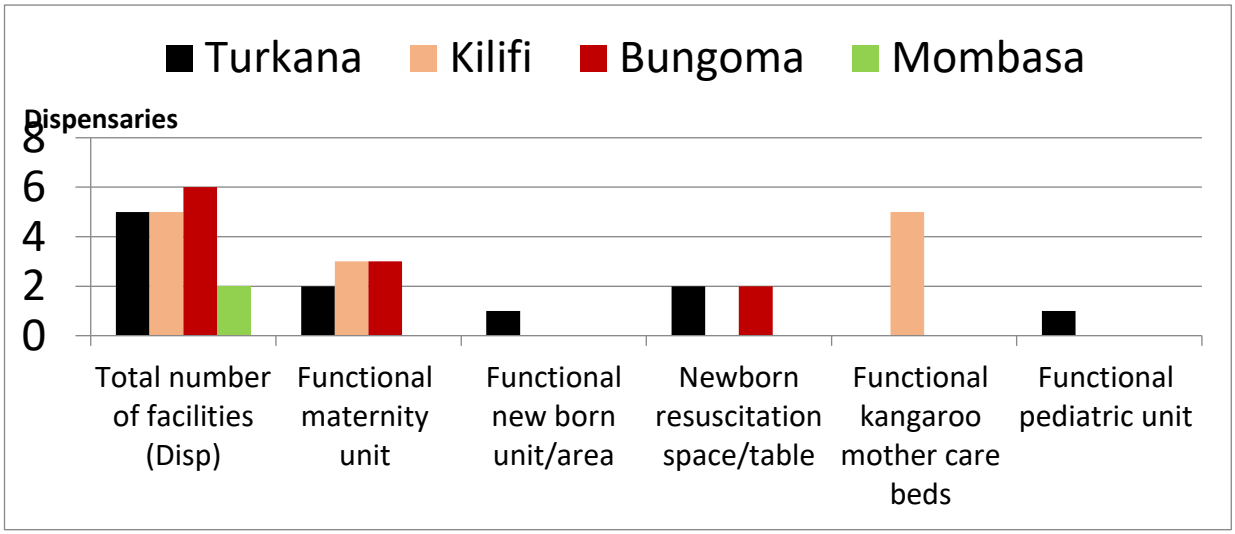


Figure 9: Functionality of Dispensaries

79.2% of the facilities had adequate designated space for infants. Various service areas were in good condition including floors with no damages, functional doors, window panels were not broken, and no leaking roofs. (Table 10)

Table 10: Status of various service areas

	County Referral Hospital		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
	3	**%**	7	**%**	15	**%**	12	**%**	1	**%**	1	**%**	39	**%**
Floor with no damages (Labor ward)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	1	100.0	30	76.9
Floor with no damages (Delivery room)	3	100.0	7	100.0	13	86.7	12	100.0	1	100.0	1	100.0	37	94.9
Floor with no damages (maternity)	3	100.0	7	100.0	12	80.0	7	58.3	1	100.0	1	100.0	31	79.5
Floor with no damages (Postnatal ward)	3	100.0	6	85.7	10	66.7	5	41.7	0	0.0	1	100.0	25	64.1
Floor with no damages (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Floor with no damages (Pediatric ward)	2	66.7	5	71.4	3	20.0	1	8.3	1	100.0	0	0.0	12	30.8
Doors are	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	1	100.0	30	76.9

functional/lockable (Labor ward)														
Doors are functional/lockable (Delivery room)	3	100.0	6	85.7	13	86.7	12	100.0	1	100.0	1	100.0	36	92.3
Doors are functional/lockable (maternity)	3	100.0	7	100.0	12	80.0	7	58.3	1	100.0	1	100.0	31	79.5
Doors are functional/lockable (Postnatal ward)	3	100.0	6	85.7	11	73.3	6	50.0	0	0.0	1	100.0	27	69.2
Doors are functional/lockable (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Doors are functional/lockable (Pediatric ward)	3	100.0	5	71.4	4	26.7	1	8.3	1	100.0	0	0.0	14	35.9
Windows /window panes not broken (Labor ward)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	0	0.0	29	74.4
Windows /window panes not broken (Delivery room)	3	100.0	6	85.7	13	86.7	10	83.3	1	100.0	0	0.0	33	84.6
Windows /window panes not broken (maternity)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	0	0.0	29	74.4
Windows /window panes not broken (Postnatal ward)	3	100.0	6	85.7	11	73.3	5	41.7	0	0.0	0	0.0	25	64.1
Windows /window panes not broken (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6

Windows /window panes not broken (Pediatric ward)	3	100.0	5	71.4	4	26.7	1	8.3	1	100.0	0	0.0	14	35.9
Ceiling boards /roofs not leaking or worn out (Labor ward)	3	100.0	5	71.4	8	53.3	6	50.0	1	100.0	0	0.0	23	59.0
Ceiling boards /roofs not leaking or worn out (Delivery room)	3	100.0	6	85.7	9	60.0	8	66.7	1	100.0	0	0.0	27	69.2
Ceiling boards /roofs not leaking or worn out (maternity)	3	100.0	6	85.7	8	53.3	6	50.0	1	100.0	0	0.0	24	61.5
Ceiling boards /roofs not leaking or worn out (Postnatal ward)	3	100.0	5	71.4	8	53.3	4	33.3	0	0.0	0	0.0	20	51.3
Ceiling boards /roofs not leaking or worn out (newborn unit/space)	3	100.0	2	28.6	1	6.7	1	8.3	1	100.0	0	0.0	8	20.5
Ceiling boards /roofs not leaking or worn out (Pediatric ward)	3	100.0	4	57.1	3	20.0	1	8.3	1	100.0	0	0.0	12	30.8
Walls painted, without cracks (Labor ward)	3	100.0	6	85.7	13	86.7	7	58.3	1	100.0	0	0.0	30	76.9
Walls painted, without cracks (Delivery room)	3	100.0	7	100.0	14	93.3	11	91.7	1	100.0	0	0.0	36	92.3
Walls painted, without cracks (maternity)	3	100.0	7	100.0	13	86.7	7	58.3	1	100.0	0	0.0	31	79.5
Walls painted, without cracks (Postnatal ward)	3	100.0	6	85.7	12	80.0	6	50.0	0	0.0	0	0.0	27	69.2

Walls painted, without cracks (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Walls painted, without cracks (Pediatric ward)	3	100.0	5	71.4	3	20.0	1	8.3	1	100.0	0	0.0	13	33.3
Functioning hand washing sinks (Labor ward)	3	100.0	6	85.7	9	60.0	3	25.0	1	(00.0	1	100.0	23	59.0
Functioning hand washing sinks (Delivery room)	3	100.0	7	100.0	9	60.0	7	58.3	1	100.0	1	100.0	28	71.8
Functioning hand washing sinks (maternity)	3	100.0	6	85.7	9	60.0	4	33.3	1	100.0	1	100.0	24	61.5
Functioning hand washing sinks (Postnatal ward)	3	100.0	6	85.7	8	53.3	3	25.0	0	0.0	1	100.0	21	53.8
Functioning hand washing sinks (newborn unit/space)	3	100.0	3	42.9	1	6.7	0	0.0	1	100.0	0	0.0	8	20.5
Hand washing sinks (Pediatric ward)	3	100.0	5	71.4	1	6.7	0	0.0	1	100.0	0	0.0	10	25.6

Source Field Data(2021)

Stock outs of essential commodities

Data collected indicated that the average number of day's facilities lacked essential antibiotics for the management of PSBI in SYI significantly improved due to improvement of management of stock outs. Hospitals across all sites did not experience stock outs of Gentamicin and Benzylpenicillin, however, major stock out of Amoxil Dispersible tablets was experienced by other facilities during the last quarter of 2018 and 2nd quarter of 2019. As for Gentamycin and Benzyl penicillin, facilities experienced stock outs between 3rd quarter 2019 and 3rd quarter 2020. (Figure 10,11).

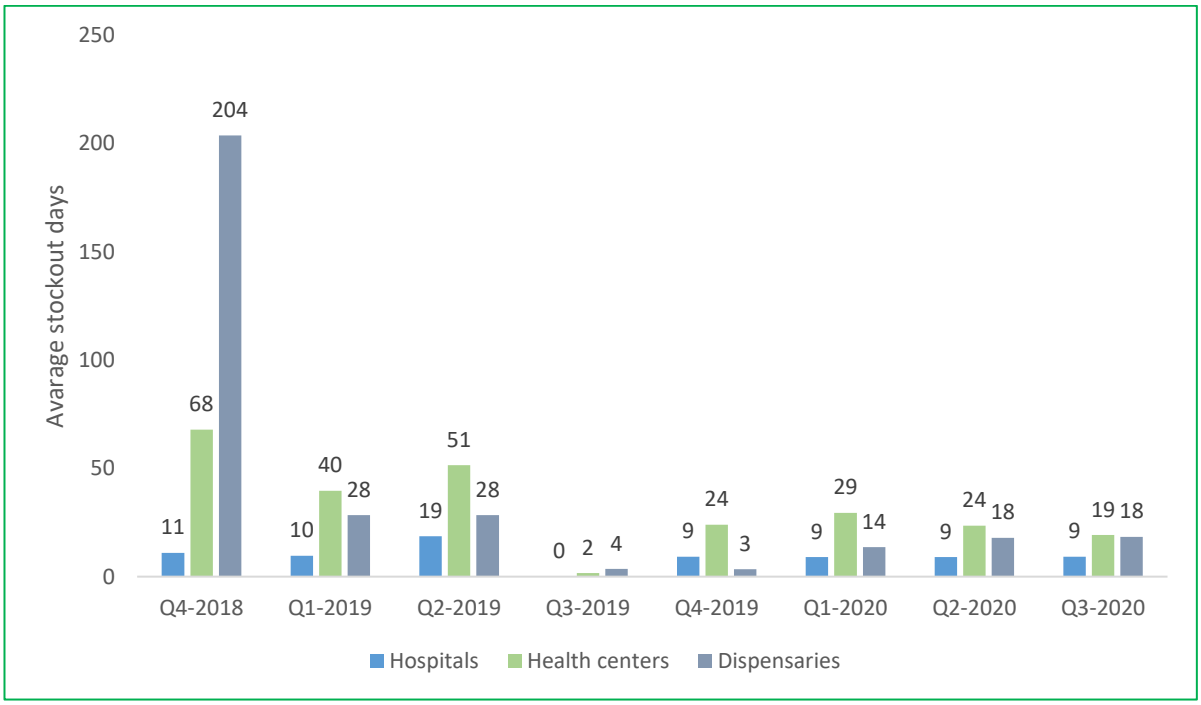


Figure 10: Average number of stock out days per quarter-Amoxicillin-DT

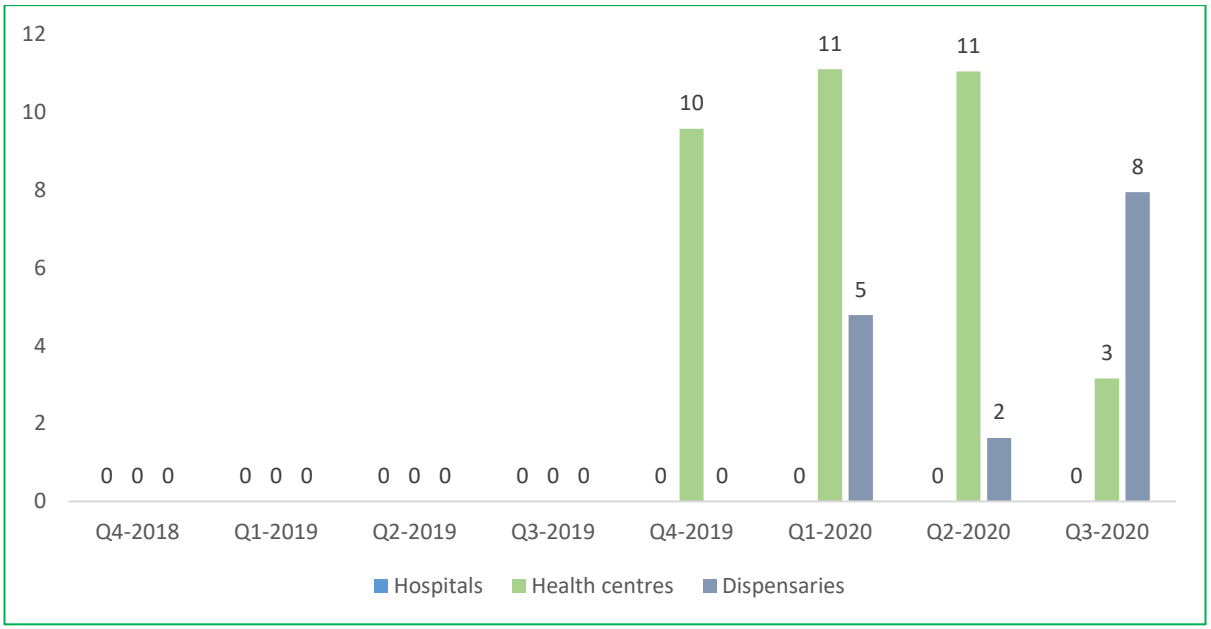


Figure 11: Average number of stock out days per quarter-Gentamicin

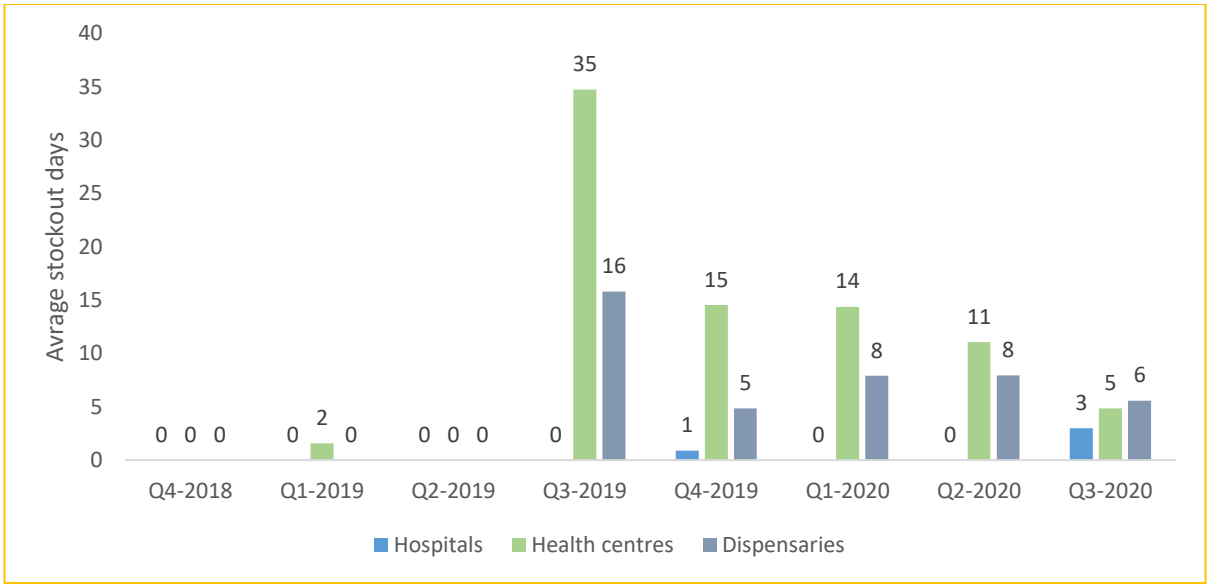


Figure 12: Average number of stock out days per quarter-Benzyl penicillin

As time went by, Facilities innovated different ways to cub the stock outs. Some of the ways introduced included, improved procurement procedures by ensuring timely requesting for the drugs, improved drug storage, and sourcing drugs from less busy facilities.

Referral pathway for SYIs

Referral out

0nly 8.3% of the facilities had a referral of sick young infants to another facility (Table 11). 5% had referral slips that they use to referral clients and amongst those who had referral slips, 88.9% said they always use them during referral while 11.1% said they use them most of the time.

Table 11: Referral practices

	County Referral Hospital		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
Evidence of referral	1	33.3	0	0	1	5.6	1	5.9	1	50	0	0	4	8.3
Use of referral slips	3	100.0	7	10 0	1 4	77.8	9	52.9	2	100	1	10 0	3 6	75.0
Frequency of utilization of referral slips														
Always	3	100.0	7	10 0	1 2	85.7	7	77.8	2	100	1	10 0	3 2	88.9
Most of the time	0	0.0	0	0	2	14.3	2	22.2	0	0	0	0	4	11.1

Source Field Data(2021)

Despite using referral slips, 83.3% went ahead and made a follow-up call to the receiving facility which they have referred a client to, Although the frequency of calling the receiving facility varied, 60% of providers opined that they always make calls, 25% calls most of the time and 12.5% said they called some of the time.

Referral in

55.3% of the facilities can receive referral from other facilities, while 92.6% accepts and receive referral from the community via CHV (Table 12). 91.3% had an existing emergency referral system available 24 hours daily, of whom 47.9% had a functional ambulance/emergency transportation system in place. Only 45.8% of those who had emergency system available in place had funds available for emergency transport (Table 13). 29.2% said there is availability of emergency services although it was being provided by a different supporting organization.

Table 12: Referrals in

	County Referral Hospital		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
Referrals from CHVs	2	66.7	4	80	11	100	5	100	2	100	1	100	25	92.6
Feedback on service provision	0	0.0	2	28.6	5	27.8	4	28.6	1	50	12	27.3		
Referrals from other facilities	3	100.0	5	71.4	11	61.1	5	29.4	2	100			26	55.3

Source Field Data(2021)

Table 13: Functionality of referral pathways

Emergency services	**County Referral Hospital**		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
	3	%	7	%	18	%	17	%	2	%	1	%	48	%
functional ambulance/emergency transportation system	3	100.0	7	100.0	6	33.3	5	29.4	1	50.0	1	100.0	23	47.9
24 hour availability of the transportation system	3	100.0	7	100.0	5	83.3	4	80.0	1	100.0	1	100.0	21	91.3
Availability of funds to support referral and emergency services	2	66.7	6	85.7	9	50.0	3	17.6	1	50.0	1	100.0	22	45.8
Organizations supporting emergency services	3	100.0	2	28.6	4	22.2	3	17.6	1	50.0	1	100.0	14	29.2

Source Field Data(2021)

From the follow up data, there as an indication of increasing numbers of community-facility referrals over time. This is represented by the graph below (figure 12) showing referral trends from the community over a two-year period.

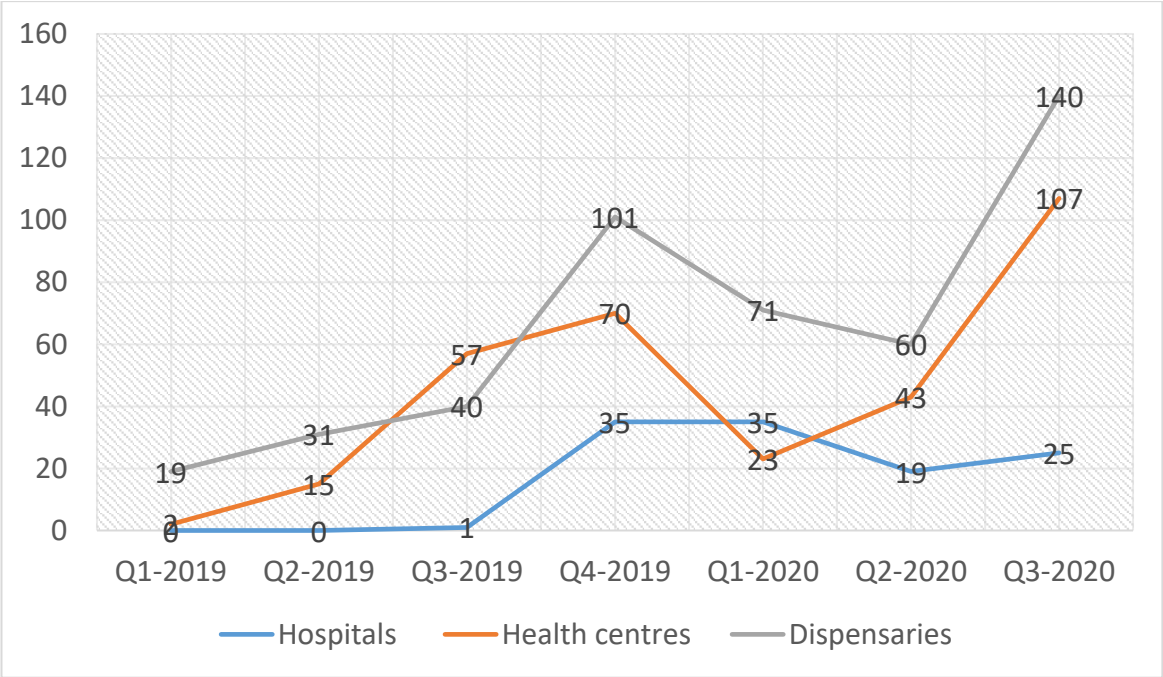


Figure 13: Community-facility referral trends

Support supervision and QIT

There was indication of a small change in facilities forming a QIT. As the graph (Figure 13) below shows, there was a slight increase in facilities that had QIT compared to earlier quarters.

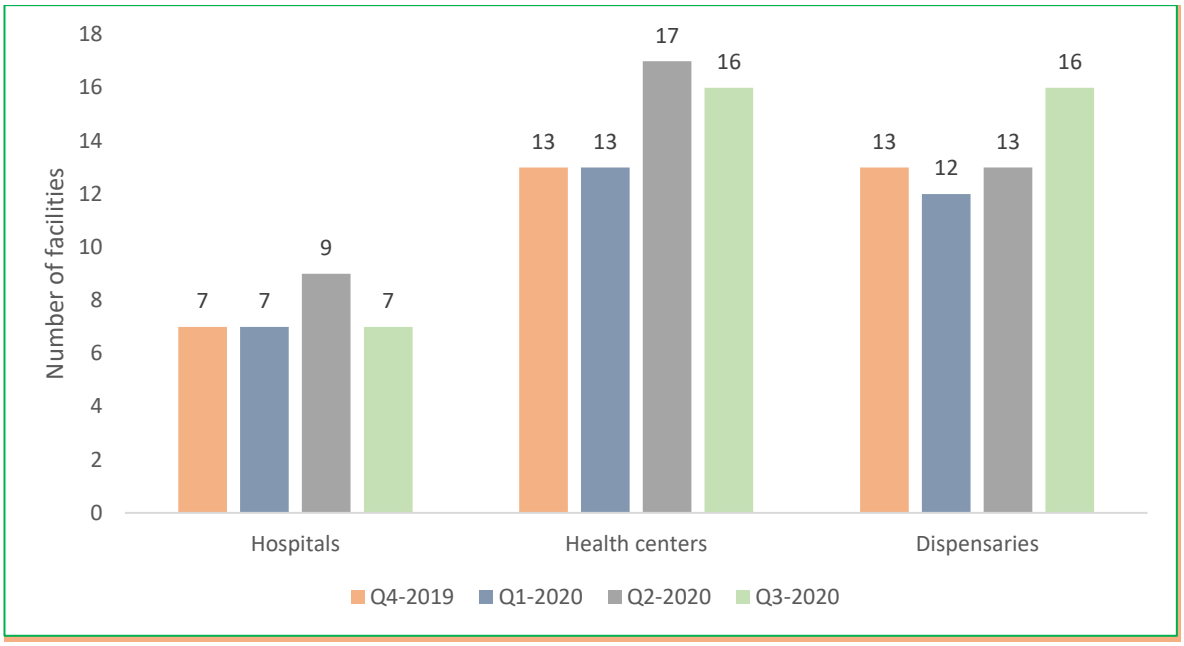


Figure 14: Facilities with functional Quality Improvement Teams

Table 14: Quality Improvement strategies

	County Referral Hospital		Sub-county hospital		Health center		Dispensary		Clinic (private/faith based)		Nursing home		Total	
	3	%	7	%	18	%	12	%	2	%	1	%	43	%
quality improvement CME in the last six month	3	100.0	3	42.9	10	55.6	2	16.7	1	50.0	1	100.0	20	46.5
QI learning session in the last year	1	33.3	6	85.7	12	66.7	4	33.3	1	50.0	1	100.0	25	58.1
Documentation of best practices by the QIT	1	33.3	5	71.4	10	55.6	4	33.3	0	0.0	1	100.0	21	48.8
Management of patient/client complains	3	100.0	7	100.0	16	88.9	9	75.0	1	50.0	1	100.0	37	86.0
Presence of a suggestion box for collecting views and feedback	2	66.7	7	100.0	15	83.3	10	83.3	2	100.0	1	100.0	37	86.0

Source Field Data(2021)

Only 46.5% of the facilities reported not to have held a CME in the last six months while most of the facilities, 86%, had managed patients' complaints (Table 14). 35.4% said they have a quarterly improvement plan in place,41.7% have staff participating in a quality improvement CME in the last six months, with 52.1% having participated in the last 1 year. 70.8% reported that their facility had managed to document best practices by the QIT. (Table 15).

Table 15: Quality improvement functionality

	Hospital		**Health centre**		**Dispensary**		**Total**		**P value**
% facilities with	**10**		**18**		**20**		**48**		
Quality improvement plan in place	6	60.0	14	77.8	13	65.0	33	68.8	0.565
staff participating on CME for newborn care	2	20.0	12	66.7	12	60.0	26	54.2	0.057
staff participating in QI learning last year	6	60.0	11	61.1	14	70.0	31	64.6	0.793
documented best practices by the QIT	6	60.0	13	72.2	15	75.0	34	70.8	0.668

Source Field Data(2021)

Table 16: Support supervision

	County Referral Hospital		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
	3	%	7	%	18	%	17	%	2	%	1		48	%
Supportive supervision in the last quarter	3	100.0	7	100.0	14	77.8	15	88.2	2	100.0	1	100.0	42	87.5
Maternal health services	3	100.0	6	85.7	12	66.7	12	70.6	2	100.0	1	100.0	36	75.0
New born/child health services	3	100.0	6	85.7	10	55.6	11	64.7	2	100.0	1	100.0	33	68.8
Utilization of a supervision checklist	3	100.0	7	100.0	17	94.4	16	94.1	2	100.0	1	100.0	46	95.8
Provision of feedback	2	66.7	7	100.0	15	83.3	14	82.4	2	100.0	1	100.0	41	85.4
CHV supervision	3	100.0	6	85.7	16	88.9	16	94.1	2	100.0	1	100.0	44	91.7
CHV supervision conducted in the last quarter	2	66.7	5	71.4	15	83.3	16	94.1	2	100.0	1	100.0	41	85.4

Source Field Data(2021)

83.5% had support supervision taken place in the facility in the last quarter. (Table16).

Availability of utilities

Reliability of electricity was assessed and 95.3% of the facilities had 24-hour electricity supply, 85.4% relied on the national electric grid as the main power source and 20.8% were used Solar power. 10.4% said they use a generator while 4.2% said they use LPG/Gas. Other than the main source of energy, 66.7% Had a backup system mainly using Generator, Solar power, or LPG/Gas. 84.2% said at least the backup system was readily available in case the main source failed.

Piped water and Bore hole were the main source of water with 47.9% and 31.3% respectively, although 45.8% of the facilities reported to never having water flow in the facility.

4.3 To develop innovative, sustainable health strategies in implementation of PSBI guidelines in selected counties in Kenya

The following key emergent themes from qualitative interviews informed the development of facility level and community level interventions that were leveraged on in PSBI implementation.

4.3.1 Community care seeking dynamics

4.3.1.1 Newborn practices that precipitate illness

Sub-theme: Cultural practices

Naming practices and community birth ceremonies were implicated as contributors of delayed care seeking since signs and symptoms of illnesses were perceived as the young infant rejecting their given name. The ceremonies involved seclusion of newborns which meant a delay in care seeking.

"… What I mean is I had never seen a baby whose umbilical stump hasn't fallen outside the house or even at the hospital… So the baby will stay with that problem till 4 days

are done and the stump has fallen stump falls off... Only then can they be able to take the baby to a facility for treatment." [Turkana FGD CHV]

Practices surrounding prevention of infant deaths like placing the baby outside uncovered, introducing traditional herbs and cutting of the ear may expose the newborn to further illnesses and infections.

"If there has been a death of a newborn in a certain household, once there is another birth, the baby is placed outside the gate of the home without covering the baby, then someone will come from outside and pick the baby and get into the home and say" I have collected a baby" then they will pick the baby, and give him medicine made from roots and leaves and then dress the baby and leave him now to grow normally." [Bungoma FGD CHV]

Early weaning and feeding practices hinder the newborn receiving the immunological effects of colostrum, therefore, making the infant susceptible to PSBI.

".....Also, we realized that most of these babies have stomach issues because of the mixing of different milks. There is the goat milk that is much heavier than breastmilk but is still given to these babies. Sometimes they are given water, maybe the water isn't even clean." [Turkana FGD CHV]

In some communities, smoking of tobacco in common rooms was practiced which may have been an avenue of the infant contracting respiratory complications. Traditional remedies to infant's symptoms such as high fever increased the newborn's predisposition to infections as reported below:

"For infants maybe there is this traditional medicine they sprinkle on the baby." [Bungoma IDI Young Mothers 19-24 years]

"Suddenly I felt my infant hitting me, it was having fits. So I quickly rose and carried the infant and took to my grandmother. When she saw the infant, she said put her down quickly, and urinate on it. I told her I'm not feeling any urine…."[Kilifi FGD with Mothers 25-45 years]

The practice of placing infants outside because the mother has experienced pervious deaths of young instants predisposes infants to illness. Some people would place young infants outside uncovered. This is done to prevent them from dying like the previous siblings:

"If there has been a death of a newborn in a certain household, once there is another birth, the baby is placed outside the gate of the home without covering the baby, then someone will come from outside and pick the baby and get into the home and say 'I have collected a baby' then they will pick the baby, and give him medicine made from roots and leaves and then dress the baby and leave him now to grow normally." [FGD_CHV, Bungoma]

Sub-theme: Knowledge on appropriate newborn practices

The caregivers, including young mothers 15-18 years, demonstrated some knowledge on the care of newborns and young infants at home.

".....it depends the way you keep your baby. You can find someone just putting the baby on the seat instead of putting him/her under the mosquito net then you find that a mosquito bites someone else and comes and bites the baby, that way the baby gets malaria…" [Bungoma FGD Young Mothers 15-18 years]

Even with availability of health education on the importance of exclusive breastfeeding of young infants, there are those who still introduce other foods to the new born.

"I can say it's these foods. For example, after we delivered our babies, we were told we are supposed to breastfeed exclusively for six months but others starts giving the babies other foods early before the six months and that make them sick." [Bungoma FGD Young Mothers 15-18 years]

Sub-theme- Cord care practices

Cord care management is a huge contributor to PSBI. There is the need for community education and sensitization regarding proper cord care practices. This could be achieved by use of local resources e.g., CHVs, TBAs and older women. The evidence indicates the use of various remedies that result in PSBI that include cow dung and urinating on the cord.

"For example when a baby has high temperature due to falling of its cord the father urinates on the wound even when in public and this can be treated in the clinic it is believed the urine will stop the hiking temperature" [Mombasa FGD CHVs]

"… then we also have a believe that a newborn is born at home the only thing they can put on the stump is the cow dung and you know how risky it is with the new born so the child is brought here with sepsis cord…" [Turkana IDI Provider]

"Like in my community some take ugali cooking stick then they rub it against something then they take that powder and put it on the navel. They say that that makes it to dry up faster than other methods. Though I have never used it, but I have just heard of it." [Mombasa FGD 19-24 Mothers]

4.3.1.2 Identification of danger signs of PSBI

Coastal communities commonly associated high fever with bird disease (Owl) and this can only be treated with the aid of a witchdoctor; sometimes the baby can be urinated on as a remedy for fevers. This presents opportunities for more infections on the infants. It

also implies that knowledge levels of caregivers on infant illness determines the timing and source of care.

"*That bird thing is when the baby is sick and has convulsions because of high temperature, so instead of them bringing them to the hospital they take them to Witchdoctors who give them ammunition to tie to their infants' hands or neck……"* [Mombasa FGD CHV]

Caregivers indicated an ability to recognize danger signs of PSBI. This was however compounded by sociocultural factors which negatively influenced care seeking.

> *" The umbilical cord, When the baby cries a lot, you find that the mother tells you that the baby has been crying a lot, but sometimes we just notice that it is abdominal colic. Then in other case the eyes have discharge.."* [Bungoma IDI Provider]

> *"There are those symptoms that when we see, sometimes when a baby has chronic malaria, it can show as a serious cold, we need to be keen on that and you will find out that it is malaria. So we cannot say that it is only a cold. So some times when you see a child sick, you need to go to the doctor so that the baby is attended to."* [Bungoma FGD Men >35 years]

In Matulo in Bungoma, diarrhea is also categorized according to color and this influences decision making process whether the infant will be taken to the facility or not; Green color is related with "*Embaa"*, a condition that can only be handled at home by use of herbs otherwise the baby will not recover. The outcome of the herb is that it has a burning effect on the infants' face.

> *" The one the baby diarrheas green stool. So they say if he/she has diarrhea and cries a lot, there is a medicine they use, leaves, crush them*

and gives the baby but I have never given mine. Then another thing, when the baby is 2 months or 1 month, there are things that come out on the face, they burn the face you find that one side is too brown and the other side black. That one also we are told there is no medicine you can be given from the hospital. You look for another animal which stays in water, remove the skin and apply on the face of the baby and it will clear. Without that even if you take the baby to hospital, he/she will never recover." [FGD Mothers 19-24 years, Bungoma]

Other observable features of illness include sunken and yellowing of the eyes as opined by caregivers:

"My mother woke up that morning and did not check on the baby, but later she told me the baby's eyes were yellow and I should take the baby to the dispensary near home. When I took the baby, they told me, for this one no." – [IDI_Young mothers, 15-18 years, Bungoma]

4.3.1.3 Decision making process in seeking care for SYIs

Based on the understanding of the cause of illness, recognition and understanding of symptoms, the decision-making process is influenced by a number of people ranging from immediate members of family-(mother of the baby or both parents), grandmothers, mothers-in-law, men and other relatives. The second category is neighbors and traditional birth attendants. Parent-in-law or grandmothers play a role in what action is taken given their experience and their power in the household or based on who finances the care-seeking process:

"The mother of the child has got no say it is the grandmother who has a lot of power in management of the grandchild. The mother might not be willing to go but she will be

forced to and because she is in that surrounding of those people and the people are helping her, she has no alternative but follow what she is being instructed to do." [IDI_Provider, Mombasa]

"Either her husband, her mother-in-law or her father-in-law. But the mother must wait for 'Mwenyewe', she must get the green light from the husband, mother-in-law or father-in-law." [FGD CHV, Kilifi]

It was apparent that men play a vital role in providing financial support and remind mothers of the treatment that needs to be given to the infant. However, the absence of the father or male guardian may delay care-seeking thereby endangering the life of the sick infant. It was also reported that the mother of the sick infant has a role in close monitoring due to time spent with the infants and can make decision when other crucial players like the husbands are not home.

"the men have a very big role to play, because when you leave the whole responsibility to the woman when the baby is sick, and she has nowhere to begin from, although some normally deliver without men, but you find that they normally get a lot of problems. If you have a man around and your baby falls sick, you as a mother must tell the father that the baby is sick like this, like this, how sick the baby is, so that he can think even if he has no money, he will try by all means for the baby to get treatment. So that, the baby gets well. So the man, when the man is absent when the baby is born, that baby may not even survive. So a man is a very important part of a baby's life. And they are very instrumental in making sure that the baby gets treatment." [Bungoma_FGD_Older men>35 years]

Mothers-in-law seem to have different roles ranging from support in symptom recognition, providing financial support when the mother may not have or make decision on what home remedies can be provided at home:

"When there are issues like teething problems the mother-in-law may help in making decision to whether she can remove the teeth herself or being referred to the other person or being taken to the health facility. She wears the glove and she cuts the gum with a small steel, that steel is being washed with warm water…. you cut the gum with that steel and a traditional drug is being applied to the wound. It is called 'chepsukut'."
[FGD_Young mothers 19-25 years, Turkana]

Table 17: Role of different actors in decision making process by site

Bungoma	Kilifi	Turkana	Mombasa
Grandmothers are critical given their perceived experience	Concept of "owner" has power on decision made when infant is unwell	Grand mothers are critical in symptom recognition and decision to see care	Close relatives including grandmothers are critical players in decision making because of household setting
Men provide financial support-to access treatment and where to seek care	Absenteeism of men may delay care seeking	Mother play a role at different stages of sickness and availability of other critical members of family	Men facilitate care seeking through financial support
Women have initial role in consulting with family in condition of infant	Mother has role in making decision	Neighbors provide financial and social support	Neighbors provide social support to the sickness and acts as a source of information for symptom recognition
Neighbors consulted for action and potential sources of care	Neighbors can provide social support		TBA acts as companion for childcare at home
Parents of the baby recognizes symptom for action	Other relatives such as sister in-laws, siblings consulted for action or seeking consent for action		
Parent in always may provide financial support			
TBA Monitors and influence decision making and act as companions			

Source Field Data(2021)

4.3.1.4 Delays in care seeking

Factors discussed were contextual revolving around geographical access that delays prompt action. This was described in the form of either distance to the facility or lack of money to access the services:

"Distance to the facility you know most of the people here comes from very far you see this facility covers up to… there is a place 100km from here so they come from far maybe somebody… maybe transport if a mother doesn't have transport to come to the facility, will she come? She will first stay and observe from home, if the problem is fever, they will observe if it can subside so distance is a factor so they will stay at home and observe if the problem can subside." [IDI_Provider, Turkana]

Poor terrain makes it hard for caregivers to access services when promptly required for sick infants. The bad roads as well as lack of means of transport and the costs needed make them rely heavily on motorcycle transport that is costly. This is worse during the rainy season which often leads to delay in care seeking and sometimes makes it complex for CHVs to provide services:

"Another issue is transport, in the community we are referred to as Daktari, so you are called then you find someone is so sick and doesn't even have transport, so you have to start fundraising in the community, after getting the money to take this person to the facility , they still look up to you for treatment fee, so you become a burden to the community and even sometimes we end up spending money from our own pocket, because again if you don't help and that person happens to die, they'll blame you and you might be rejected, so you would rather bring them to the facility and disappear. And wait to hear for the aftermath." [FGD_CHV, Mombasa]

Lack of money treatment resulted in delayed care seeking process which may result in fatality thus caregivers seek alternative sources. There is need to sustained interventions in community health financing.

"following the one of lack of money is that, because I know that going to hospital will take me time, if I don't try these other ways, the baby could die. That way, it contributes that I say let me try these weird ways of mine first, with the knowledge that I was born with, I try the dew, I try the hot water, even like the other one said to lay the baby on the lap, and the second thing, besides the treatment, there is the challenge of the road, because our roads, and the way we live away from the hospital, like there are those who live near the river, it will take me time to come. If I say about the modes of transport we use here, with the kind of roads we have here, it will not be possible, and so it will also take me time to reach here. So if this baby really has blocked nose, how do I reach her to the hospital and she has blocked nose, and the road we use to the facility is also a problem, that makes me try those other ways, the stand that I have is that the lack of money in the pocket, makes me try those ways, the second thing is the time that I spend to reach the hospital…" [Bungoma_FGD_Older men above 35 years]

Social constructs that may delay a woman's care seeking decision include: (1) lack of parental support among teenage pregnant women; (2) community perception on premature infants, in which infants are often neglected due to a belief that they will not survive; and (3) lack of spousal support which can cause additional emotional stress to women:

"Maybe you get a family where the girl has delivered at home, and this family, parents are very bitter, the girl, whoever is responsible for that infant does not take responsibilities. So, you get maybe the parents become very harsh to this girl, because

maybe the child is sick, they have no other way to get those drugs or other services. They can even sideline this girl." [IDI_provider, Bungoma]

"Sometimes the baby gets sick when you are not even prepared, and probably there is no one to assist at home; you haven't finished your house chores, you'll have to go to the hospital regardless and getting there also is a problem you'll be taken in circle, get late again home, and again maybe you have a husband who doesn't understand, he will start quarrelling." [FGD_Young mothers 15-18 years, Mombasa]

Religious practices also hinder access to services such as immunization or seeking care early in cases where the child has to caregiver have to adhere to certain religious rituals. Some of which can be detrimental to the infant.

Table 18: Barriers to care seeking for Sick Young Infants

Bungoma	**Kilifi**	**Turkana**	**Mombasa**
Perceived corruption when referred & Unclear referral system causes wrangles between the facility and community	Perceptions of mistrust of system when referred	Cost and means of transport	
Social support structures	Lack of transport undermines the ability to make decision of seeking care at the facility	Distance to facilities	Perception of premature infants
Costs of access to facilities	Lack for money especially for registration and medicines	Previous experiences of long ques and other service challenges such as lack of drugs	
Poor road networks	Distance to facilities	Knowledge levels among caregivers	Believe in witchcraft and religious practices
Costs of treatment-buying medicines when supplies ate unavailable	Mandatory HIV testing	Insecurity when accessing facilities	Understanding of caused of illness and action taken

Provider attitudes - Long queues at the facility caused by laxity and unapproachable providers Lack of supplies at the facility discourages caregivers from seeking care at the facility- Challenges of lack of money Inadequate staffing leading to long queues Unavailability of providers beyond normal working hours and or absenteeism Understanding of causes of illness and action taken	Inability to make independent decisions due to cultural influence Discrimination basing on the infant's health/status	Understanding of caused of illness and action taken	Communication barriers due to providers poor attitude-The caregivers can't express themselves

Source Field Data(2021)

4.3.2 Options for care seeking

Provision of care for SYI begins with various options. Some opt to use local chemist or shops, herbalists, or traditional medicines to manage the condition while others use a facility. The latter is because of fear of potential death:

"What will influence them, if there is death of a baby that has been reported in another village that will force them to bring their children to the facility, if their babies get worse may be the child vomits everything you try to breast feed for that case you have to bring the child to the facility or the child has fever may be she has even tried to give these other drugs but the child still has fever, she will bring that child to the facility."

[IDI_Provider, Bungoma]

Use of chemist or drugs shops is due to four main reasons. First, long queues associated with the perception of shortage of providers. Second, the decision is often made by the father of baby to avoid the long procedures at the facility or the understanding that the

facilities have no drugs. Third, inadequate finances or challenges of referral to the next level of care due to distance to the facility and issues of transport. Fourth, use of drug from shops was described with the understanding that the condition is not serious, or the drugs are used as a form of first aid.

"Other times there may be a shortage of providers in the facility so once they go to the hospital and find a queue, they prefer to go to the chemist and just buy medicine of which they may not understand some of these medicines." [FGD_CHV, Bungoma]

Use of local remedies was perceived to delay care seeking as they use it as a first option before seeking care or where there are challenges of getting treatment at the facility, ignorance, lack of money or knowledge among caregivers. They include making the bones strong:

"Like in the morning he is (fukiswa)...they use incense, carbon soda and garlic leaves...so it is put there so that he can feel happy ...and then to make the bones stronger, he is exposed to fire (kukazwa moto)...with the fire used to put those things (they are called mafusho ya kitoto) so you do like this and strengthen the bones." **[**FGD_CHV, Mombasa]

4.3.3 Perceptions on the quality of care in the management of SYIs in primary healthcare settings

Perceived care given to sick young infants is described around four domains of quality of care in accordance with WHO's Standards for improving quality of maternal and newborn care in health facilities [25]; availability of essential physical resources, timely evidence-based practices, competent and motivated human resource, respect, and preservation of dignity. The physical resources of care refer to the health facilities'

topography in relation to treatment initiation and availability of drugs and equipment in management of SYI.

Availability of essential physical resources

Availability of drugs and equipment for managing SYI

Majority of the respondents reported inadequacies in equipment at the primary health care facilities as a challenge hindering effective service delivery. In cases where equipment is available, it was not inadequate to cater for the needs of SYI as was illustrated by discussants in focus group discussions.

"*They normally refer when it comes to delivery complication, they also refer cases like when an infant has difficulty in breathing because there is no proper equipment to check the reason for the breathing problem at this facility so they now advice for referral*" [FGD, Young men, Turkana.]

"It's not easily available especially when admitting the baby who is very sick. Sometimes they can tell there is a machine or certain supplies which are not available. That's why sometimes most people just go back home with a sick baby. And others end up losing the baby in the process. That's what I have seen." [FGD, Young mothers, Bungoma.]

In some sites, primary health care facilities were reported to have adequate drugs and equipment: *"And the equipment are available, to be honest we are really dealt with in a very good way...even medicines we do not pay for them...and if even the cases of being sent to go and buy medication outside it is not there...*" [IDI, Young Mothers, Mombasa.]

In addition, many of them reported frequent stock outs of drugs in facilities forcing them to buy drugs from private pharmacies after being prescribed in the facilities.

"*Sometimes they come here but there is no medicine so instead of going to the health centre, they will still be sent out to buy medicine, they opt to go straight to the chemist*' [FGD, CHV, Bungoma.]

"When you get to the health facility, normally the infant is tested and a diagnosis made, then a prescription is given to you. However, you find that there are no drugs in the facility, so you are given the prescription to go and buy the drugs from a chemist outlet." [FGD, Younger men, Kilifi.]

The inadequacy of drugs in facilities leads to clients resorting to other alternative treatments like using traditional medicines;

"Most of us go for traditional medicine because there are no drugs at the facility so when we come here and find no drugs we still go back to traditional medicine because we have no option. I am suggesting that government should ensure steady supply of medicine in all facilities, when they are supported with food, they will have no problem, when they are provided with drugs they won't have any problem" [FGD, Older men, Turkana.]

Health facility infrastructure and adequate service space in for SYIs

Availability of infrastructures such laboratories and ambulance for referrals was considered key to provision of quality care for SYIs. The views of caregivers and care givers were similar across the study sites. Caregiver noted that some facilities did not offer necessary laboratory services, as a result they were forced to travel long distances to get such services.

"*This facility does not offer laboratory services or test when you visit, when you come for treatment services, they only test you HIV and malaria. When you are suffering from any other infection you will be forced to go to for laboratory services"* [FGD_Older mothers 25-49 years, Turkana]

Caregivers also decried of lack of adequate space for SYIs in some facilities which could compromise privacy for the patients during consultations, cleanliness and hygiene due to congestion.

"They need to expand the hospital to increase space, sometimes it's usually very congested, you can even lack space and we cannot access other hospital because they are far. Medicine, sometimes you come and find out that there are no drugs" [FGD_Young Mothers, 19-24, Mombasa.]

Providers noted that lack of postnatal wards at PHCs was hindering provision of quality care to newborns. Most providers recommended creating or expanding postnatal wards at PHCs to be able to monitor mothers and their newborns for a few days before they are discharged to go home.

"We need to have a postnatal ward so that a mother can stay for a day or two because in our facility one will give birth in the morning and by 4 o'clock they released to go home. Even if you want them to stay, where will they sleep?" [IDI Health Provider, Bungoma]

Timely evidence-based practices for routine care

Delays in initiating treatment

Delay in initiating treatment was one reason caregivers avoided seeking treatment in primary health care facilities for SYI. Delays were because of long queues in public

facilities or perceived attitudes. Majority of the participants complained that providers are quite slow when attending to patients given that they prioritized meetings and chatting with colleagues while others attributed this to shortage of providers in facilities.

"*Sometimes women say they are delayed because either there are many people, or the service is slow, so they opt to buy medicine from the chemist*" [FGD, CHV, Bungoma]

"Sometimes you can go and find there are no people, but they take a long time before they attend to you." [FGD, Young mothers, Bungoma]

"My friend's baby was sick the other day. Her baby was having diarrhoea and vomiting. We went together to the dispensary. The nurse prescribed drugs for the baby. When we went to the pharmacy, they took her book and kept it on the shelf and they continued to do their other things. The baby was vomiting and diarrhea while they continued doing their things" [FGD, Young mothers, Kilifi]

Long ques result to cases of bribery or nepotism where some clients would part with some under the table payments so that they can be served faster, while others are served as a result of knowing the providers personally:

"*Sometimes the government hospitals are good to go to seek treatment but also you need to know someone. I would say like if you have come at 7:00am and another person comes at 10 am but goes ahead of you to see the doctor without queuing yet you have woken up early but you stay there until evening yet there are people that come later than you but pass you. So you wonder someone comes after you and gets treated then go leaving you there*" [FGD, Older women, Mombasa]

The third reason for delays in initiating treatment is linked to inadequate providers and absenteeism or unclear provider's working schedule as was pointed by various discussants:

"The doctor is not easily available therefore derailing health services. This may lead to being served by this unqualified staff. They work in shifts and they also go to the referral hospital where they serve other patients there. So, you may be forced to wait for the doctors until he or she arrived from wherever place he came from. [FGD, Young women, Turkana]

"Most of the time, when it comes to health issues, when you leave here, let's say maybe you're going to XXXX, if you go at 7am the doctor will come at 9.30am, 10am…so you have stayed there for long. Even if you really wanted to save that child you may find that it is dead already. On my part, I have other children, and when my wife was sick, we left here at around 6 am and took her to XXX…" [FGD, Young men, Mombasa]

"*Especially when the doctor comes out and see a long queue of patients waiting, he tells us to settle down. He goes back to the office and exits from the other door. Recently, someone was so sick when we were queuing the doctor tried to escape, we followed him to the gate and brought him back and we threatened him that we were going to report him to his seniors*." [FGD, Young mothers, Turkana]

"Services are available the only problem is the lack of adequate staff at the facility to provide efficient services to young infants, sometimes you arrive at 9am, you queue and when it reaches 1pm, the provider leaves for lunch saying she is tired because she is alone so you see you have no one to serve you" [FGD, Older men, Turkana]

The low numbers of qualified providers lead to the use of student trainees in facilities, and this is perceived as low quality care.

"The other problem we have in this facility is that most of the time we are served by trainees who have come for internship, they cause a lot of injuries to young infants trying to locate veins, they don't do accurate diagnosis and this results into giving

wrong medication for example you have a problem in the chest but you are given drug for malaria ,…… here we have very few qualified providers since most of them are trainees" [FGD, Older men, Turkana]

The fourth reason for delayed treatment is fragmentation of service architecture or lack of prioritization for SYI.

"*Then again when a mother has been referred, they are not given priority to the facility they go to, and so they have to move around from one department to another buying files and registering and all this time she is moving around with the baby who has not yet been treated. Once you finish the process is when they attend to you*". [FGD, CHV, Bungoma]

"Like when your child is seriously sick and they are vomiting or even have a diarrhea, you have to queue for long. The doctors have to finish with the lab then go to the pharmacy so they take a lot of time." [FGD, Young mothers, Mombasa]

"*In our hospitals here like this one here, even if you come with a very sick baby, you will have to queue like the others. So the time will be going and the baby becomes unconscious they will now tell you to take the baby to Webuye and they have not attended to him/her even a bit*." [FGD, Young mothers, Bungoma]

"*If you are lucky the line is short or the service is fast then you will go home early. If not (Exclaims) you will sleep here my sister and still queue the following day and maybe your baby is in a serious state. (Laughter) Also, that is the difference between here and the district hospital. When you go there and your baby is seriously sick, they will take you to the casualty and attend to you and the baby very fast.*" [FGD, Young women, Turkana]

Compounded with delays associated with long ques, it was reported that referral facilities had complex processes which delayed treatment:

"I *was taken round and round asking you to get files and forms and everywhere you go is just a queue, so it becomes difficult*." [FGD, CHV, Bungoma]

These experiences result in caregiver adapting to later consultation times which results in conflicts with providers as a CHV reported.

"*Most mother here do not want to come early to the hospital because they will not be served on time, there is a lot of laxity, so the mothers prefer to come at about 10 or 11 am and still other stay at home and come at 1 o'clock and when they come at that time the providers are very harsh to tell them to come early, and even the one who comes early is not attended to on time, so that is what happens here. They even prefer to go to the private facilities where they will pay some money but be attended to faster.*" [FGD, CHV, Bungoma]

Competent, motivated human resource

For effective and efficient delivery of services, facilities and healthcare providers need support; training and motivation to enable them to perform effectively. There were several factors that enhance performance of providers as discussed below.

Provider knowledge and care provided

Caregivers were asked whether in their opinions the providers who attended to them have the adequate knowledge, skills or experience. Even though most of them did not answer the question with certainty, they seem to imply that the providers were either knowledgeable but offered services out of ignorance or lacked basic skills necessary to support management of SYI;

"*Ignorance. They have the knowledge but to me I feel they are just offering poor service*." [FGD, Older mothers, Kilifi]

"*Indeed, I have observed that our providers here do not have special skills for infants, they do routine work that applies to both adults and children"* [FGD, Married men >35 years, Kilifi].

Adequate knowledge of providers was reported to be key to the successful treatment of the sick infant:

"*Yes, I saw they had the skills, they give you advise and its up to you to make the decision because the baby is yours and risk...like you see mine had the yellow coloring, that is what scared me because if the coloring is very high it can go up to the brain, so we were just telling the doctor that we were depending on him to give us advise, we would ask him about the risks of getting the baby out of the hospital and how it would be back at home because he was being put in the photo-therapy machine in the hospital...*" [IDI, Young mothers, Mombasa]

However, majority of the respondents across all counties stated that when infants are taken for treatment, the providers just prescribe medication without carrying out the necessary laboratory tests. Some of them would be forced to come back a few other times because the medication did not work, until the tests are done, and proper diagnosis is given. To validate this view, providers were asked the greatest challenge they face while managing SYI and some reported the delicate nature of infants made it hard to have definitive diagnosis as one provider noted:

"Managing an infant is quite challenging because for one thing they are delicate, so in most cases for example if they have a bacterial infection, or if you suspect bacterial infections may be they present with fever, but we usually rule out malaria but now if the

baby persist with fever may be you have checked out the cord, you have ruled out tetanus, its difficult to come out with the right diagnosis, but basically one can just give out an antibiotic to cover. Basically, managing infants is quite challenging" [IDI, Provider, Bungoma]

Whenever caregivers noticed that their babies have not recovered, they resort to other alternative treatments such as prayers and traditional medicines.

"With the nature of the sickness. There is that one which you've been treating at the hospital for some time and the baby isn't getting well at all. If you're a Christian, you will resort to prayers. If you're a traditionalist, you will resort to the traditions [child crying]" [FGD, Young mothers, Kilifi].

Passion for work and Teamwork

Some providers cited that they serve the community and that is the reason why despite the many challenges they are facing in the facilities, they still have the motivation to go to work every day. Consequently, most of the providers reported that the issue of staff shortage generates teamwork especially when providers from various departments in the facility are called upon to work in other departments.

"*Mmm....what motivates me is one, the passion for work...it is not the salary...if it is about the salary I would be coming at 8 and leave at 4, because am just looking for the salary, so it is the passion for the work that I just want to see that mother, that sick child, tomorrow we meet in the streets i see them healthy, that is what motivates me. The second thing that motivates me is the teamwork spirit that we have in the facility; that yes I have a lot but my colleagues are willing to chip in and help where necessary...where they can...so we have a lot of teamwork in the facility. With the little resources in terms of the human resources that we have, if my comprehensive care*

center personnel is not there, I have that time to go and see those clients…I have a clinician in the ccc so if am not there or am overwhelmed, she will not mind coming from ccc and seeing 2/3 patients..." [IDI, Provider, Mombasa.]

County support

Some providers asserted that the support they receive from counties or sub county managers motivates them to work;

"*At the moment what I can say we have doctors available throughout that the county has provided for us not like before, we have at least one pediatrician who is there for us, and equipment at least we have incubators for premature babies…. even if they are less they are there it is not unlike when we had only two and again most of the drugs when we need them they are there …..like, gentamicin is always there, I can see it's there……"* [IDI, Provider, Turkana]

"*Aaah....we have a supportive team from the sub-county that does support supervision and they still support us as our immediate supervisors, for us, they are so supportive ....ahhh generally that...despite the challenges that we face every day...related to infrastructure, lack of the necessary facility in terms of what I need to do my work and all that...yea..."* [IDI, Provider, Mombasa.]

Respect and preservation of dignity

Good care practices

Caregivers expressed how they were attended to by healthcare providers. Some caregivers expressed being handled very well and receiving quality SYIs services from provider. Others reported feeling belittled when they sought care at facilities claiming that some providers were extremely harsh; would quarrel, abuse or look down upon

them. Disrespect on the part of providers was discouraging care seeking for SYIs for some caregivers as explained by a young caregiver below.

"… you can be explaining to the doctor how the baby is feeling and then s/he starts quarrelling; 'oh why didn't you bring the baby earlier than this' and so many things. They harass us and if they become like this, we may start fearing them and hide when the baby is sick. So, they should stop all these" [FGD_Young mothers_15-18, Bungoma]

Health provider attitude

The caregivers expressed how they are attended to by healthcare providers. Some believed some providers handle them very well and offer quality of services while others had a bad attitude.

"*In the scenario you will have to know the doctor and have his number. Once you call him and tell him the condition of your baby is critical, you will jump the queue*. [FGD, Young mothers, Mombasa]

"*For me, I feel the provider attitude needs to improve. For instance, you could come here to give birth but then the providers will use very harsh language on you, especially female providers, insults that are so embarrassing. Actually, this is what makes women fear to give birth in health facilities, yet giving birth is a woman's duty*." [FGD, Older mothers, Kilifi]

There is something that guys don't want to mention, there are nurses who are so arrogant and have poor attitude towards the patients, this causes communication barrier between the patient and the provider, it's as if they are forced to do their work, sometimes someone may have even forgotten or there are those who probably didn't go

to school, so when time comes to give the baby medication they probably might have forgotten, when you just ask in good faith ,they shout at you. [FGD, CHVs, Mombasa]

"I wanted to talk about when they are doing the checkups for the children, sometimes the providers abuse the mothers if the child is thin or dirty, instead of being counselled and advised on what to do when the child is like that they are abused. So the next time they will find it hard to go back to the clinic because of that." [FGD, CHV, Kilifi]

Others also asserted that a mother would be treated depending on how she carried herself; if she was clean and elegant, she would be treated well as opposed to vice versa.

"*When I was pregnant, I used to come to clinic so elegantly dressed, you would think I work in a bank. They used to like me a lot, so whenever I came even at 10am and others had come as early as 6am, I would be called in and attended to promptly and thoroughly… (Participants laughing). So these providers, once you come smartly dressed and with your confidence, then will not show you contempt, instead you will be served well."* [FGD, Older mothers, Kilifi]

Table 19: Perceptions of quality of care and approaches to improve management of Sick Young Infants in primary care settings

Themes of quality of care	Caregivers perception	Provider perception	Effect on managing SYI	Priority approaches to improve SYI care
Availability of essential physical resources -space and essential medicines	Availability of drugs and equipment hindered service provision	Frequent stock out of essential drugs and supplies makes it difficult to offer quality services to SYIs	Procurement challenges and lack of health systems' prioritization of newborn care leads to frequent stock outs and referrals to higher level facilities	-Advocacy for prioritization of essential medicines - Tracking of stock outs and use of data in the community of practice platform to inform decision makers on commodity needs in facilities -Use provider network redistribute medicines to other facilities
Timely, evidence-based routine practices	Delays in initiating treatment due to long queues as a result of inadequate providers, absenteeism and complex service architecture	Inadequate staffing	Low staffing of PHCs and fragmentation of service structure limits identification very SYI for timely care	Simple triaging mechanism and advocacy for effective human resource management in PHC facilities
Competent and motivated human resource	Inadequate provider knowledge and skills to manage SYI, lack of provider motivation in service delivery	Complexity in managing SYI due to their fragility	Affects service provision of SYI, necessitate referral leading to congestion in higher level facilities	Update providers on IMNCI, use of the community of practice platform and encouraging network of providers to enhance exchange learnings
Respect and preservation of	Varying perceptions on the	Strenuous and taxing	Affects care seeking for	Advocate for approaches

dignity	respect and dignity from providers- with caregivers being treated with disrespect due to negative provider attitudes among others	work environment	SYI-causes delay in care seeking, responsible for other resorts to care	to improve provider-client interactions in PHC such as community engagement forums
Functional referral systems	Lack of ambulances, additional resources e.g. fuel and appropriate equipment	Some facilities do not have ambulances that conform to standards required for emergency referral	Increased burden on caregivers whose babies required referral	Strategies to equip lower level PHC with essential equipment and drugs will ensure timely access to treatment for SYI and reduce unnecessary referrals to higher level facilities
Effective communication	Varying perceptions with some caregivers voicing satisfaction with information provided by providers and others pointing out concerns in infant assessment by providers	Adequate communication strategies with need for more involvement of CHVs	Deters care seeking, client-provider interaction and client satisfaction in services provided to SYI	Sensitization of providers on importance of effective communication and involvement of CHVs at the community level on dissemination of information on PSBI

Source Field Data(2021)

1. Feasibility of implementation of PSBI guidelines

1.1. Referral pathway

Some caregivers felt that when referred for primary health care the assessment and treatment given at the primary care facility was inadequate.

"Mostly have taken a child there they will just tell you this one we can't yet they have not even checked the child or done tests but they just tell you this one we can't take to xyz….." [Mombasa FGD Men Below 35 years]

There was a perceived laxity among health providers when it came to how health providers treat some referral cases that may have resulted to death of young infants seeking care. This was described in the context of delays in initiating treatment once referred from primary to a secondary facility.

" We told them to give us a referral letter we go to hospital. They told us to wait a little, they went and sat in their room and they stayed for long. Then they came back, they said not yet, let the baby stay there. It reached 6pm, other sisters started closing the doors and left. We were left with 1 sister. We told her to give us a referral letter we go to Webuye. She told us if we don't have money we should sort ourselves out on how to go there. Now, we didn't have money so we decided since even if we stay here nobody will help us, it's better to go home. So we went home with the baby. On arriving home, we stayed for a while then the baby started getting cold. At around 1am the baby started crying and he died." [Bungoma IDI Young mothers 15-18 years]

Caregivers noted however that wherever transport is available, it facilitated movement to the next level of care which eases the process of referral. This was in some cases accompanied with a referral note which facilitates access to care to the next level. In

other locations care givers are despised, sometimes for failure to follow procedure (including providing referral notes) which leads to expensive referral processes:

"Those who have been referred are despised the most with claims that you could have gone there first instead." [FGD_Young women 19-24 years, Mombasa]

"When my child fall from the bicycle, I went to the hospital looking for support but when I reached there, I was told to give out 10,000 which was to aid on ambulance to xxx where the child was to be checked for x-ray. But I didn't use the ambulance because I was forced to go back and borrow some money which I board a vehicle which took me to xxx for child treatment." [FGD_Young mothers 19-24 years, Turkana]

There are several reasons why referral is given to SYI. From primary-secondary level facilities, referral can be given for diagnostic services like x-rays.

"This facility doesn't have the laboratory services or test when you visit, they only test you HIV and malaria. When you are suffering from any other infection you will be forced to go somewhere or to look for laboratory services." [FGD_Older mothers 25-49 years, Turkana]

Another reason for referral is other treatment needs such as blood transfusion, use of incubators for managing sick infants and reconstructive surgeries. Other cases are referred for cord management, burn or when there are no skilled providers to manage the cases or inadequate staff at the primary care level:

"My daughter delivered here and the baby was born with some complications, the baby had a growth near the mouth so breathing was a problem, so they referred the baby to the hospital and sent an ambulance to come and pick the baby, so getting to the hospital, again, they referred to Eldoret and that is where they operated that growth and then the baby was discharged and is now okay." [FGD_CHV, Bungoma]

Use of an accompanied staff from the referring facility varied with site. Some reported that having an accompanied staff makes referral smoother however this was not common give the inadequacies in staff at primary care level forcing caregivers to use relatives:

"They tell you it's for fuel and they give one or two doctors to accompany you to attend to you fast. If you go alone, you can stay from noon to around 3 pm before you get to the scanning room. So, they give you doctors, when they see them they know you are coming for a certain hospital and attend to you fast." [FGD_Young mothers 19-24 years, Bungoma]

Sometimes referral process is executed through communication between the facilities:

"The administrator communicates with the other hospital administrator, they are the ones who monitor the condition of the patient who is being referred, and if the condition of the patient worsens then they will make the decision together to refer the patient yet another hospital." [FGD_CHV, Turkana]

The unfamiliarity of the referral facility coupled with long ques makes it hard for clients to understand the process of referral especially community-facility referrals:

"You can get there and find out that that hospital, you are new there and you have no one to show/take you around, so they can tell you to go room number four and you don't know where that room is, so you start getting confused there." [IDI_Young mothers 19-24 years, Bungoma

Care seekers reported that referral has advantages as they can access equipment and specialized treatment in secondary care facilities that aren't available at primary care facilities:

"When I went, I was referred to the nursery, and at the nursery they took the baby and showed me how to place the baby in the incubator where there is a place they have designed with heat where you put the baby after breastfeeding and cover the eyes so that that light does not affect the baby. They used to inject the baby twice a day until the baby was well." [IDI, Young mother 15-18 years, Bungoma]

In some instances, participants reported that care seekers with referral slips experience swift services at the secondary facilities making it easier to access the services:

"In my opinion, they agree to it because when they go with that referral form, they are treated. They also won't have to queue." [FGD_CHV, Turkana]

For community-facility referrals, care seekers find it advantageous that they get to pick the facilities to go to. This reduces transportation costs and by extension time taken when seeking healthcare. The main disadvantage of referral is that the cost of treatment is often significantly higher, affecting the decision of care givers to pursue referrals:

"You might get there, and they ask you to pay some money before attending to you. If you don't have, they tell you to wait until they attend to other people. If you don't have your person to attend or handle you well, you can even loose the baby." [IDI_Young mothers 19-24 years, Bungoma]

Study participants discussed reasons for refusing referral. The process of seeking care in higher level facilities is complex and caregivers prefer seeking care in facilities they are familiar with:

"Some may be referred, but because they don't know that place they will refuse to go, because nobody can help them." [FGD_Young mothers 19-24 years, Turkana]

"The other challenge now is also in the community as I told you earlier some mothers are reluctant as I told you as the caregiver I told you … some of them resist also, they also start saying "ooh when I go to xxx who is going to take care of my babies at home who will pay for this, who will cater… I mean now it becomes an issue again." [IDI_Provider, Turkana]

"Most women also play a part in providing for the family. So, when she is not at home and she is in the hospital with the child, things at home come to a standstill. The children are not attended to like cooking for them, showering, so of course there will be something missing." [FGD_CHV, Kilifi]

Others discussed the cost of transportation, distance, and logistics of referral as cumbersome, making it hard for them to accept referral. When being referred, caregivers expect the health facility will facilitate their transportation, but sometimes this does not happen. Even those referred queue with the rest to access services. Lack of funds for transportation or money for inpatient care makes it hard for the caregivers to adhere to referral:

"The problem with referrals is not every client will cooperate, some will tell you they don't have money. They will tell you the hospital is far; they don't have money, so it's challenging." [Provider, Bungoma]

Others are ignorant of the process indicating a need for community education and sensitization regarding care seeking and referral:

"Like they can give you some medicine or they just send you to go to another hospital. And when you get to the other hospital, they start asking you questions so if the baby was in a bad state, he/she can die." [IDI_Young mothers 19-24 years, Bungoma]

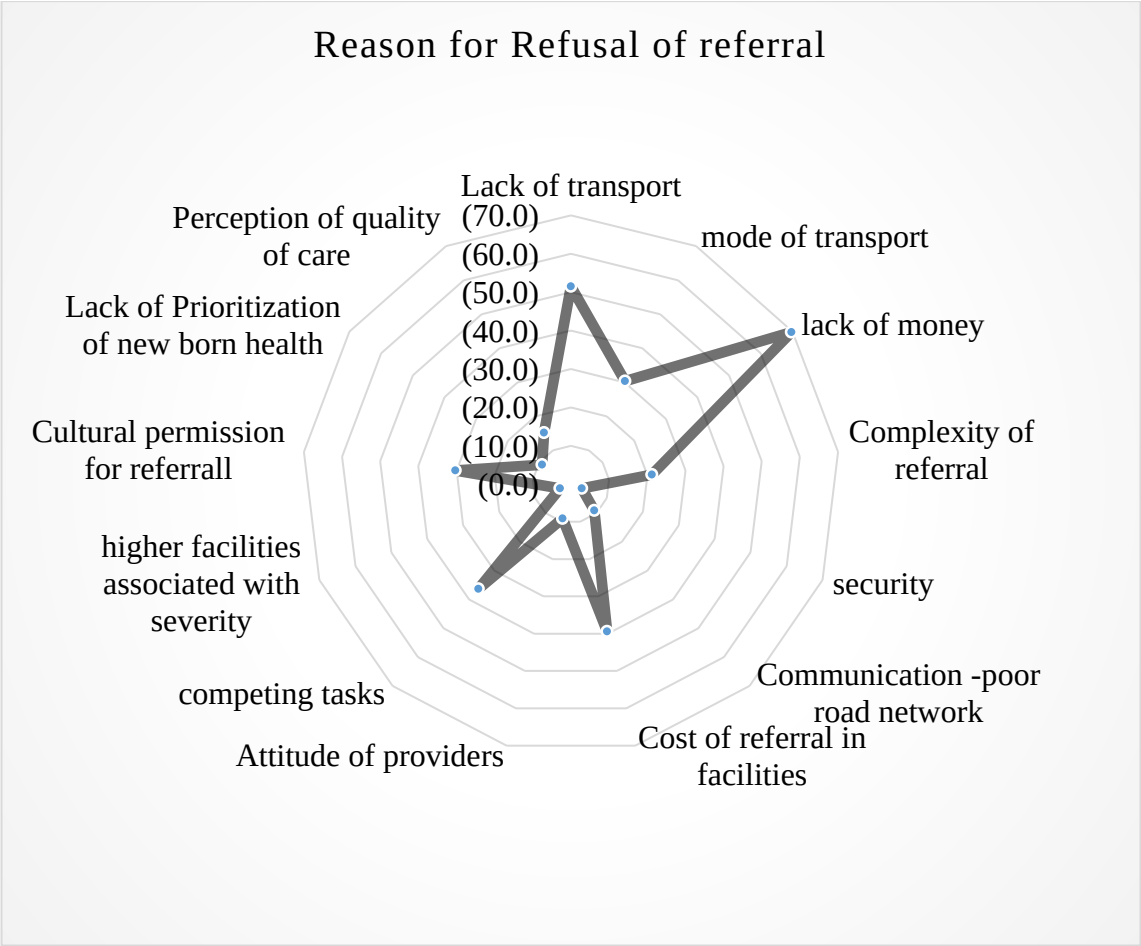


Figure 15: Reasons given for refusal of referral

1.2. Role of CHEWs and CHVs in the management of SYIs

Community health volunteers (CHVs) have a critical role in follow up of young infant born in the community providing an opportunity for messaging as well as acting as referral agents at the primary care level.

"We the CHVs, when a baby is born somewhere, we always follow up to know the health status of the baby." [FGD_CHV, Bungoma]

CHVs advice caregivers on the danger signs that would require prompt access to treatment. However, this role is often challenged by inadequate knowledge or skills as one commented that older women are sometimes challenging to deal with.

"*There are also women who are older than you who you ask what kind of disease could this be and she tells me the kind of medicine to give the child and also if I am supposed to take the baby to the hospital."* [FGD_ Young mothers 19-24 years, Mombasa]

In other settings they initiate first aid depending on the condition:

"When a CHV conducts a home visit, he or she will make this decision depending on the condition of the baby, if the baby is critically ill, then they will be referred to the hospital immediately. If the baby is unwell but the condition is not serious then as a CHV we can just give out Panadol or any other medicine and then follow up after 3 days to see whether the baby's condition has improved." [FGD_CHV, Turkana]

CHVs are also important actors in ensuring community facility linkages happen and act as a source of information to community members:

"What makes me happy about the Community Health Workers is that they visit all households and provide information on what is happening at the hospital, the services that are offered. The second thing is that there could be a new thing happening at the

hospital, maybe there is a meeting, or a new drug for the infants, like immunization, is being given somewhere, and you have no idea, at the village, but those health workers, will come and tell you that they have attended those meetings and they bring that information to the village. I really like them because of that provision of information, they do something like sensitizing the community." [FGD_Older men>35 years, Bungoma]

"The CHVS, they encounter these mothers in the community, do sometimes they refer them to us and when these mothers are in the villages they usually give them health education. Thry tell them if you see a child feeling bad don't stay with her/him take the child to hospital. So they give them education." [IDI Provider, Bungoma]

However, the CHV often experience challenges that are similar across sites. Inadequate number of CHVs, makes it hard for them to reach newborns and mothers:

"*The people who move around in our homes (CHVs), they should not be two or three; there should be an effort to increase them. They should be many. When they are many, it becomes easier for them to visit the children. If they visit the babies, they will empower their parents - you know a baby can fall sick and the parent just stays with him/her at home. They need to even come to the hospital and say that there are some children who are sick, who need to come to the hospital, even if it is possible, they can even come with them. If you see them with the parent and the baby, the doctors will have that heart of treating the baby. But if they just come home and tell you take the baby to the hospital, your heart will still be far from that decision because you are still thinking that maybe you will not get satisfactory treatment. So, they should be many. So that they walk everywhere, every day, just to monitor the health of the newborns."* [FGD_Older men>35 years, Bungoma]

The second challenge is lack of transport to enable them to access households efficiently, therefore limiting their ability to reach all communities in need of a CHV:

"Transport, to reach the areas where they go educating the community members. There are other places where they cannot reach and that is where the services are needed the most. Because the people there seek advice from among themselves. You can be visited, and your child is sick, and a woman just comes saying that at some point even her child had the same symptoms and I did this and this. And maybe it is not the same problem. There was a time my child's leg was shaking then a certain mother came saying that her child was also like that and we went and broke the leg and then it healed, and it is ok now. I was told but I said that I must first see the doctor to know why. But the doctor just said it was normal in children and treated it. If we had followed the other mother's advice, we would ruin the child's leg." [FGD_Older men>35 years, Kilifi]

4.4 To describe the current health systems policies influencing uptake of PSBI guidelines in selected counties in Kenya

4.4.1 IMNCI strategies

The IMCI (Integrated Management of Childhood Illness) guidelines were developed by the WHO and UNICEF to provide simple, effective procedures for the management of serious illnesses and causes of mortality in young children (WHO, 2005). The guidelines promote evidence-based treatment regimens based on a syndromic approach supporting affordable, effective, and rational use of drugs. This pediatric management strategy has shown evidence of health care quality improvement and increased cost savings in multi-country assessments (Ahmed et al., 2010). The guidelines were introduced with the aim of reduction of morbidity and mortality in low-middle-income countries with inadequate health infrastructure. In each country, IMCI guidelines are adapted to create consistency in national treatment guidelines and other policies at first

level facilities. The strategies aim to reduce childhood deaths from conditions that include diarrhea, acute respiratory infections, measles, malnutrition, and malaria (Ahmed et al., 2010).

The WHO recommends the implementation of PSBI guidelines within the context of national health strategies as countries strive towards universal healthcare coverage and the end to preventable deaths in newborns. The PSBI guidelines should also be incorporated within other policies including Every Newborn Plan, and intervention packages in neonatal and child health, in this case, IMNCI (WHO, 2017). The Kenyan Ministry of Health, supported by the Clinton Health Access Initiative (CHAI), revised the IMNCI guidelines to incorporate the PSBI guidelines in the pediatric management protocols in 2018. Based on the World Health Organization guidance, the incorporation and implementation should comprise of steps to introduction and scale up as part of routine care provision in PHCs (WHO, 2017). The operationalization of PSBI guidelines was under the mandate of a national coordination technical working committee that comprised of stakeholders in maternal and newborn health. A key component of this is the incorporation of updated IMNCI trainings and plans to add and increase quantities of essential medicines as per the PSBI guidelines. Integration of PSBI within IMNCI is a critical policy steppingstone towards the national scale up and adoption of the simplified treatment of PSBI.

4.4.2 Every Newborn Action Plan

The health of newborns and stillbirths remained as part of the “unfinished agenda” of the Millennium Development Goals pertaining to women’s and children’s health (WHO, 2014). This prompted the development of Every Newborn Action Plan (ENAP) launched in 2014 by the WHO with the prime vision of a world with no preventable deaths in newborns or stillbirths, every pregnancy is desired, and women and children

thrive reaching their potential in life (WHO, 2014). ENAP aims at attaining equitable and high coverage quality care through linkage with global and national plans, measurement, and accountability frameworks (Kinney et al., 2015). The plan envisions the saving of 3 million lives of women and children each year through investment in quality care during birth and specialized care provision for sick young infants. Developed in response to in country demands, it calls upon stakeholders in child health to initiate specific actions geared towards improving access and quality of health care for women and children within the care continuum. Kenya was classified as part of the countries with specific commitments to improve newborn health up to March 2015 (WHO, 2015). The guiding principles of ENAP include country leadership, human rights, integration, equity, accountability, innovation (WHO, 2014). The implementation of ENAP in high burden countries is supported by WHO and UNICEF who provide technical support coordination, monitor country implementation and progress, and provide technical assistance (WHO, 2015). Specific to newborn health-related indicators, ENAP sets out 10 core indicators. In an assessment on implementation progress of ENAP and lessons learnt, Kinney et al., (2015) reported disproportionate consideration of the components of health system building blocks in high-burden countries, of which Kenya was one of them. The most significant gap was in coverage data which is critical for measuring implementation progress (Kinney et al., 2015).

The main impact of ENAP is the global collaborative effort harmonization at country level towards improving the survival of newborns and young infants. Its impact on increasing coverage and saving lives is yet to be determined and requires strong M & E frameworks (Kinney et al., 2015). It is imperative that national neonatal health plans are continuously assessed using quality-driven data and adjustments made to meet a country's needs (Mirbaha-Hashemi et al., 2021).

4.4.3 The Kenya Maternal and Newborn Road Map

The Kenya Maternal and newborn roadmap was developed with the goal of reducing maternal and newborn morbidity and mortality towards achieving the Millennium Development Goals (MoH, 2010). The roadmap was later adapted to the Sustainable Development Goals roadmap in 2015. The roadmap as a policy directive, is led by the following objectives: strengthened data utilization and management in provision of MNH services; increased availability, accessibility, acceptability, and utility of skilled birth attendance during pregnancy, birth, and postpartum in all levels of care delivery; strengthened capacity of communities, families, individuals, and social networks. Its implementation was guided by frameworks outlined in the National Health Strategic Plans, National Reproductive Health Policy (2007), and the Child Survival and Development Strategy (2008). As a key policy in the delivery of MNH services, the roadmap will be a critical consideration in the integration of PSBI guidelines in the health service delivery framework.

4.4.4 The Kenya Health Sector Strategic Plan 2018-2023

The Kenya Health Sector Strategic Plan 2018-2023 (MoH, 2018) is the second five-year plan and outlines the midterm priorities and goals towards achievement of the Kenya Health Policy 2014-2030 (MoH, 2014). It guides the health sector on the focus areas in addressing the health agenda. Premised in Universal Health Care, and incorporating priorities and targets stipulated in SDGs and the African Union Agenda 2063, the policy is a critical pillar in resource allocation and priority setting for the Ministry of Health (MoH, 2018). The plan is part of the Kenya Health Development Agenda anchored in the Kenya Vision 2030. The targets outlined in the Kenya Health Policy 2014-2030 leverage on the Government's commitment to Universal Health Care whose objectives include: progressive increase in Kenyans covered by essential health services; increased

percentage of Kenyans covered by health financing mechanisms; progressive expansion of the scope of health benefit package accessibility; improved quality of health services; protection of Kenyans from catastrophic expenditure with particular focus on poor and vulnerable groups.

It estimates a cumulative cost of 152,088 million Kenya shillings on maternal, newborn, and reproductive health programs for the five years. The estimated cost of child health is projected at 70,342 million Kenya shillings between 2018-2023. The activities planned entail the capacity building of counties in delivering guidelines and ensuring costed budgetary lines for MNH services through orientation, sensitization, and guidance on the use of financial software.

Kenya Health Strategic Plan as a medium-term plan is arguably the most important policy consideration as it gives the strategic direction to be followed by the health sector over the five years. The implementation and integration of PSBI guidelines is dependent on the availability of resources based on priority investment and the directives as spelled out in the Kenya Essential Package for Health (MoH, 2018).

4.4.5 The Newborn, Child, and Adolescent Health (NCAH) Policy 2018

The goal of the Newborn, Child, and Adolescent Health (NCAH) policy is to accelerate reduction of newborn, child and adolescent deaths in Kenya and promote their health, development and wellbeing. Its objectives align with the SDG Goal 3 on ensuring healthy lives and promotion of the wellbeing for all at all ages (WHO, 2018). Four of its six objectives are inclined towards newborn and young infant health, a critical population PSBI guidelines implementation. These objectives include reduction of newborn, child and adolescent morbidity and mortality due to preventable communicable diseases; reduce newborn, child and adolescent morbidity and mortality due to non-communicable diseases and conditions; promoting access to quality and

comprehensive early childhood development interventions for all children especially in the first 1000 days of life; creating an enabling environment for provision of quality newborn, child and adolescent health services (MoH, 2018).

4.4.6 Integrated Community Case Management (iCCM)

This is a strategy that aims at delivering treatment interventions nearer to caregivers and sick children where accessibility of health care is challenging. Well trained community health workers and volunteers can assess, classify, and refer/treat sick children with appropriate supervision (MoH, 2013). This is in line with PSBI guidelines which rely on a functional community health system to provide much needed care to sick young infants in situations where referral is not feasible (WHO, 2017). The strategy targets conditions causing most child deaths in developing nations that include pneumonia, diarrhea, malaria, and neonatal related conditions e.g., neonatal sepsis (World Vision, 2022). The use of community health workers and volunteers has proven a cost effective and effective strategy of care provision to children and the community (WHO, 2012). With adequate training and supervision, the CHWs and CHVs can acquire and retain the relevant skills and knowledge needed to provide appropriate care to sick young infants. Kenya has already rolled-out the country-level planning, county level engagement, implementation in terms of training and monitoring and assessment of iCCM activities integrating newborn services and PSBI interventions in the four participating counties.

4.5 To assess the cost implication of implementation of new PSBI guidelines on the community and caregivers in selected counties in Kenya

The costs were categorized into three main components. The first is the transport cost, especially in remote settings where distances to referral facility are long:

"You are given a referral letter and an ambulance to the referred facility so while there, is upon you to take care of yourself while there at the referral facility… they also give

you a nurse to accompany you but you pay allowance for the driver and the nurse accompanying the mother and the patient." [FGD_Men> 35 years, Turkana]

The second set of costs are associated with accommodation costs and food:

"In case we can't receive treatment here, we go elsewhere and while there we face so many problems because we don't have a place to sleep, food is also a problem while there, lack of money to pay for treatment given so I think we should have all the required equipment at our nearest facility so that we avoid the issues of referral to other facilities." [FGD Young Mothers, Turkana]

The third set of costs are the social costs especially for caregivers who have other family members to take care:

"It was not easy because myself I was confused and was stressed, had children at school, so I was just mixed up and while inside I did not even think I will come out." [IDI_ Young mother 15-18 years, Bungoma]

4.5.1 Participant case narratives on social and financial costs

Participants alluded to lacking people to leave other children (involving psychological and emotional upheavals) when seeking care for sick young infants essentially indicating a need for family involvement in care seeking and offering a support structure for caregivers.

"Those are there and many times bring challenges because… for example this mother. has … third child is the infant and is just a newborn… there are also 2 who are older… she will have to look for someone who will remain behind with the others, so that she can be able to go with the other one" [IDI CHV, Mombasa]

"… okay the other children who are left behind of course they will stay without their mother… yeah of course that one will be… is a problem." [IDI Provider, Kilifi]

Mothers refused to take their SYI to the hospitals because they'll have to incur extra cost for care of their other young ones. Others feared the loss of income on days spent to seek care for their babies.

"Sometimes the mother can have other children she is taking care of and it becomes a challenge for her because she has been admitted and maybe she is the breadwinner and so in that state it's a major challenge for her"[IDI, CHV, Mombasa]

4.5.2 Financial costs

Cost for transport is dependent on distances to the facility, inadequate means of transport and poor infrastructure. A respondent in Turkana says that they have to incur upto 8000/= to be able to adhere to PSBI treatment due to distances and poor road access. Some can withstand the long distances and walk to the facility but sometimes it warrants them to rush especially when the baby needs urgent care.

"Yes, long distance to a health facility, lack of money to pay for transport and health services in some facilities, scarcity on means of transport (few motor bikes, poor infrastructure).Kshs. 2000 to and from to the facility if uses motorbike totaling to Kshs 8000 in the all visits. [IDI, Mother, Turkana]

At the facilities, due to lack of medicine and equipment's at the facility, women are required to cater for the medicine, injections etc. during treatment. This makes them fear hence seek alternative care.

"….if there is a drug that cannot be found in that hospital, one has to be given a prescription to buy elsewhere" [IDI, Mother, Kilifi]

"that they will pay some little money for. For instance they will have to pay for the injection, and then for her to return back home…" [IDI, CHV, Bungoma]

Consultation book and consultation cost- Some caregivers must pay for their consultation services while others have to pay for the consultation book which ranges between 30-50 Kenya shillings. This amount could again cause challenges in access because not everyone is able to access care and pay the consultation cost.

"They tell you to buy the medical book that is written not for sale. It is then that you determine there is still corruption in Kenya. To also be seen and serviced by the doctor you also have to pay. They also prescribe drugs to you that you still have to pay for. So, it reaches a point we question the importance of the Linda mama card since we are still paying. Because what is the need we can as well stay without the card because we are still paying for the costs there is no way it is helping you.it is not helping. [IDI, Mother, Mombasa]

"… we have the outpatient books that come from the county, so at times when they are all taken… one has to buy for themselves an exercise book from the shops outside…. By themselves…. And at times you get that someone may not even have that Kes 10 for buying that exercise book… [IDI, CHV, Mombasa]

Due to other social cost, like leaving other children under someone's care sometimes mothers have to incur costs to ensure that that their children are left under someone's care.

"… you can come back and find she has cooked for them… so you buy her sugar, you buy her milk and you thank her. Of course, you have no money to offer her, but you've bought her something small as a gesture of appreciation on her staying with your kids. [IDI, Mother, Mombasa]

"it brings challenges that sometimes some express to the doctor that they'd prefer a written prescription as opposed to being admitted in the hospital … yes so that is also a cost that is incurred because for her… maybe it is like me, my husband and my kids…so I don't have relatives that live close by… hence I have to find a kind neighbor and have to leave them with some money, food for the needs of the others… it has expenses… financial and those that are not financial…"[IDI, CHV, Mombasa]

4.6 Summary of Implementation research outcomes

The findings on implementation research outcomes showed that indeed the PSBI guidelines are acceptable, adoptable, with clear indication of their fidelity, feasibility, and sustainability as public health interventions in low resource settings where referral for sick young infants is not feasible. This is represented by the figure below indicative of the overall implementation scores in the 48 facilities.

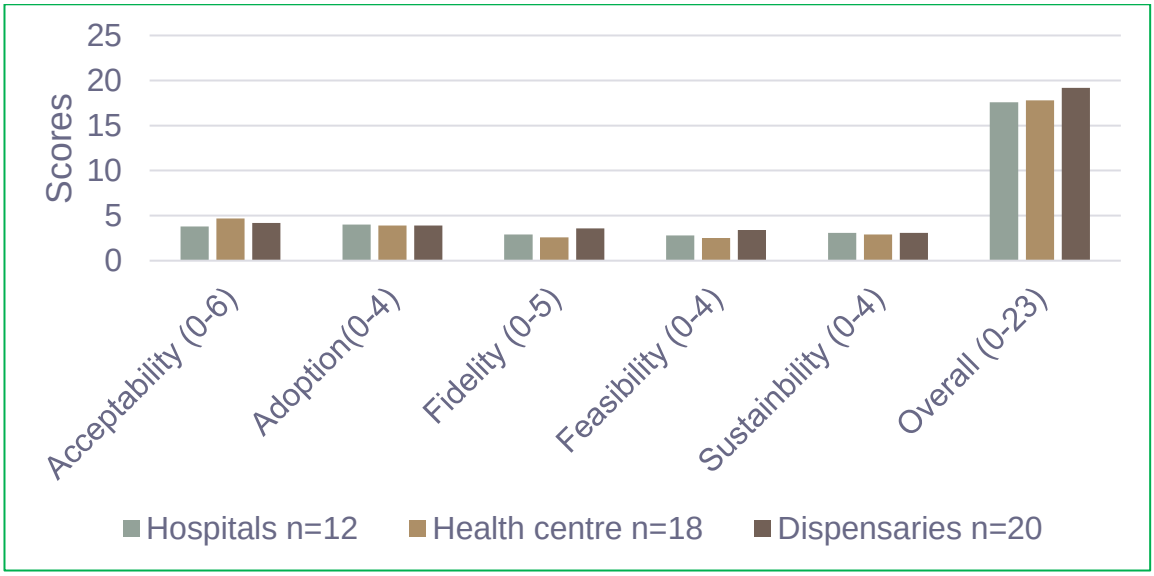


Figure 16: Implementation research outcomes scores

4.6.1 The Interventions developed and leveraged on in PSBI implementation at the facility level

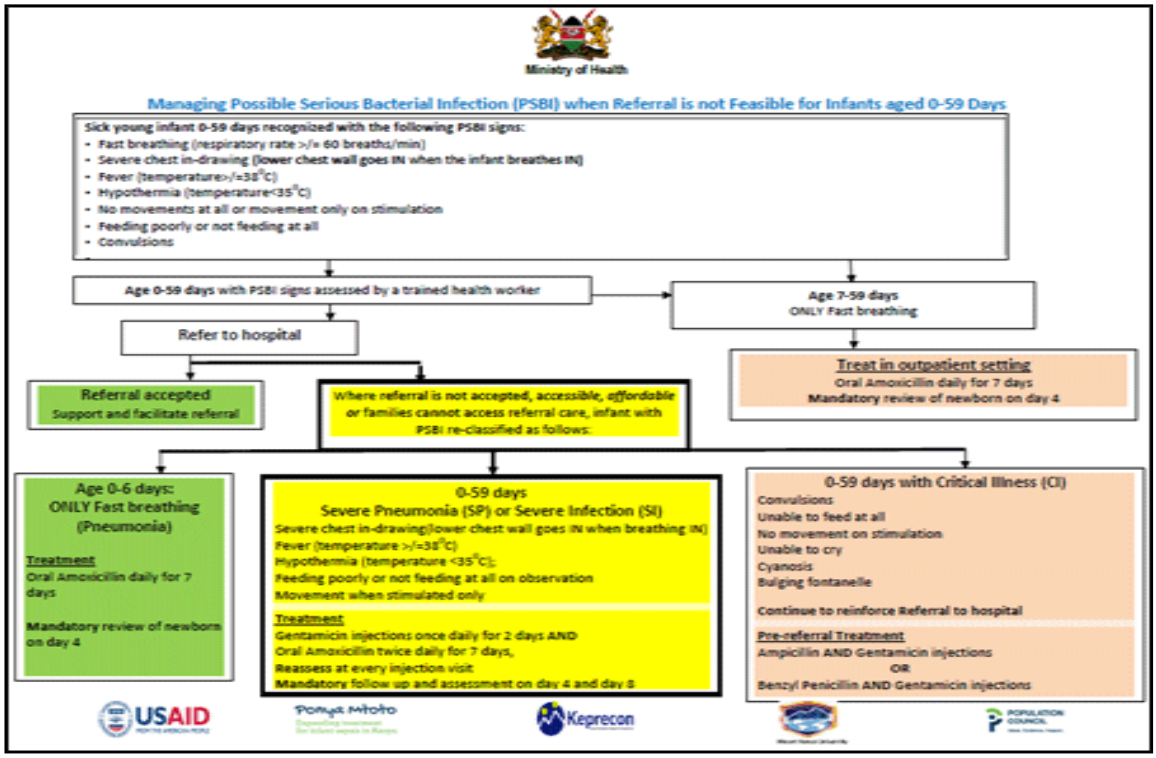


Figure 17: Job aid- Assessment and classification of PSBI chart (integrated in the IMNCI chart)

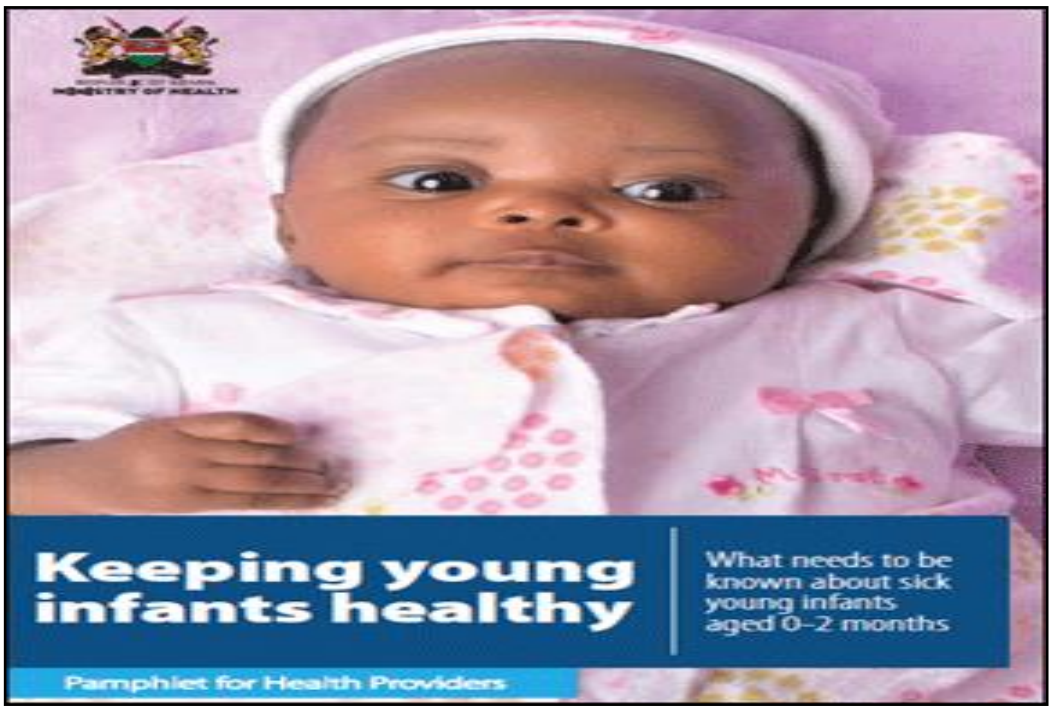
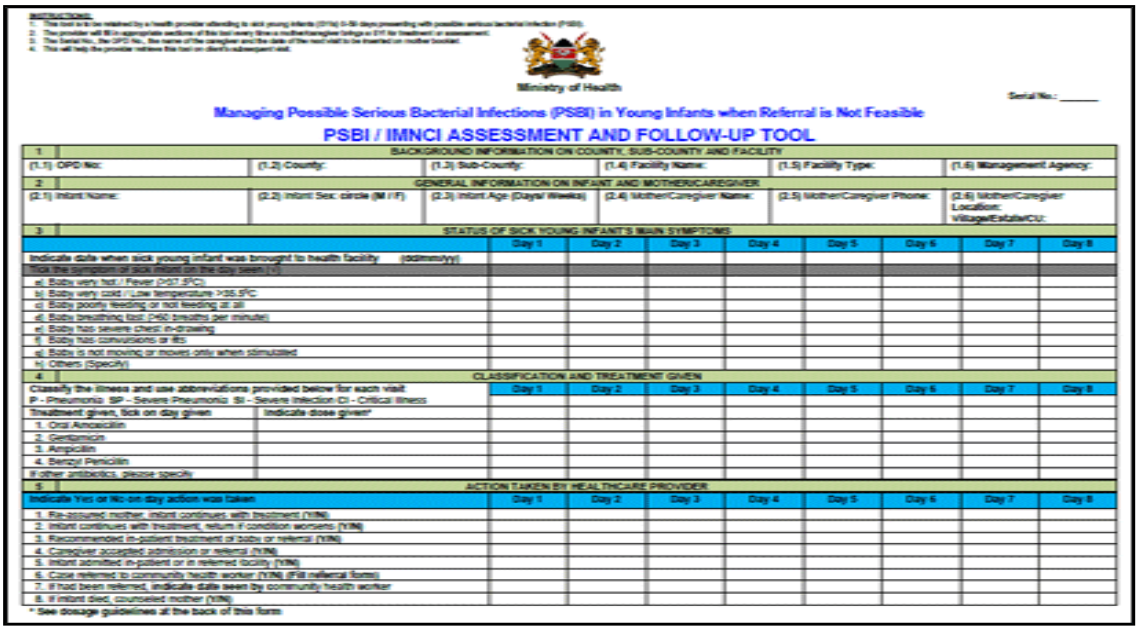


Figure 18: Provider health informational pamphlet



Ministry of Health

Serial No.: _____

Managing Possible Serious Bacterial Infections (PSBI) in Young Infants when Referral is Not Feasible

PSBI / IMNCI ASSESSMENT AND FOLLOW-UP TOOL

1	BACKGROUND INFORMATION ON COUNTY, SUB-COUNTY AND FACILITY					
(1.1) OPD No:	(1.2) County:	(1.3) Sub-County:	(1.4) Facility Name:	(1.5) Facility Type:	(1.6) Management Agency:	
2	GENERAL INFORMATION ON INFANT AND MOTHER/CAREGIVER					
(2.1) Infant Name:	(2.2) Infant Sex: circle (M / F)	(2.3) Infant Age (Days/ Weeks)	(2.4) Mother/Caregiver Name:	(2.5) Mother/Caregiver Phone:	(2.6) Mother/Caregiver Location: Village/Estate/CU:	
3	STATUS OF SICK YOUNG INFANT'S MAIN SYMPTOMS					

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Indicate date when sick young infant was brought to health facility (dd/mm/yy)								
Tick the symptom of sick infant on the day seen (1)								
a) Baby very hot / Fever (>37.5°C)								
b) Baby very cold / Low temperature <35.5°C								
c) Baby poorly feeding or not feeding at all								
d) Baby breathing fast (>60 breaths per minute)								
e) Baby has severe Chest in-Drawing								
f) Baby has convulsions or fits								
g) Baby is not moving or moves only when stimulated								
h) Others (Specify)								

4	CLASSIFICATION AND TREATMENT GIVEN								
Classify the illness and use abbreviations provided below for each visit P - Pneumonia SP - Severe Pneumonia SI - Severe Infection CI - Critical Illness		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Treatment given, tick on day given	Indicate dose given*								
1. Oral Amoxicillin									
2. Gentamicin									
3. Ampicillin									
4. Benzyl Penicillin									
If other antibiotics, please specify									

5	ACTION TAKEN BY HEALTHCARE PROVIDER								
Indicate Yes or No on day action was taken		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
1. Re-assured mother, infant continues with treatment (Y/N)									
2. Infant continues with treatment, return if condition worsens (Y/N)									
3. Recommended in-patient treatment at baby or referral (Y/N)									
4. Caregiver accepted admission or referral (Y/N)									
5. Infant admitted in-patient or in referred facility (Y/N)									
6. Case referred to community health worker (Y/N) (Fill referral form)									
7. If had been referred, indicate date seen by community health worker									
8. If infant died, counseled mother (Y/N)									

* See dosage guidelines at the back of this form

Figure 19: PSBI/IMNCI Assessment and Follow up tool

4.6.2 The Interventions leveraged on in PSBI implementation at the community level

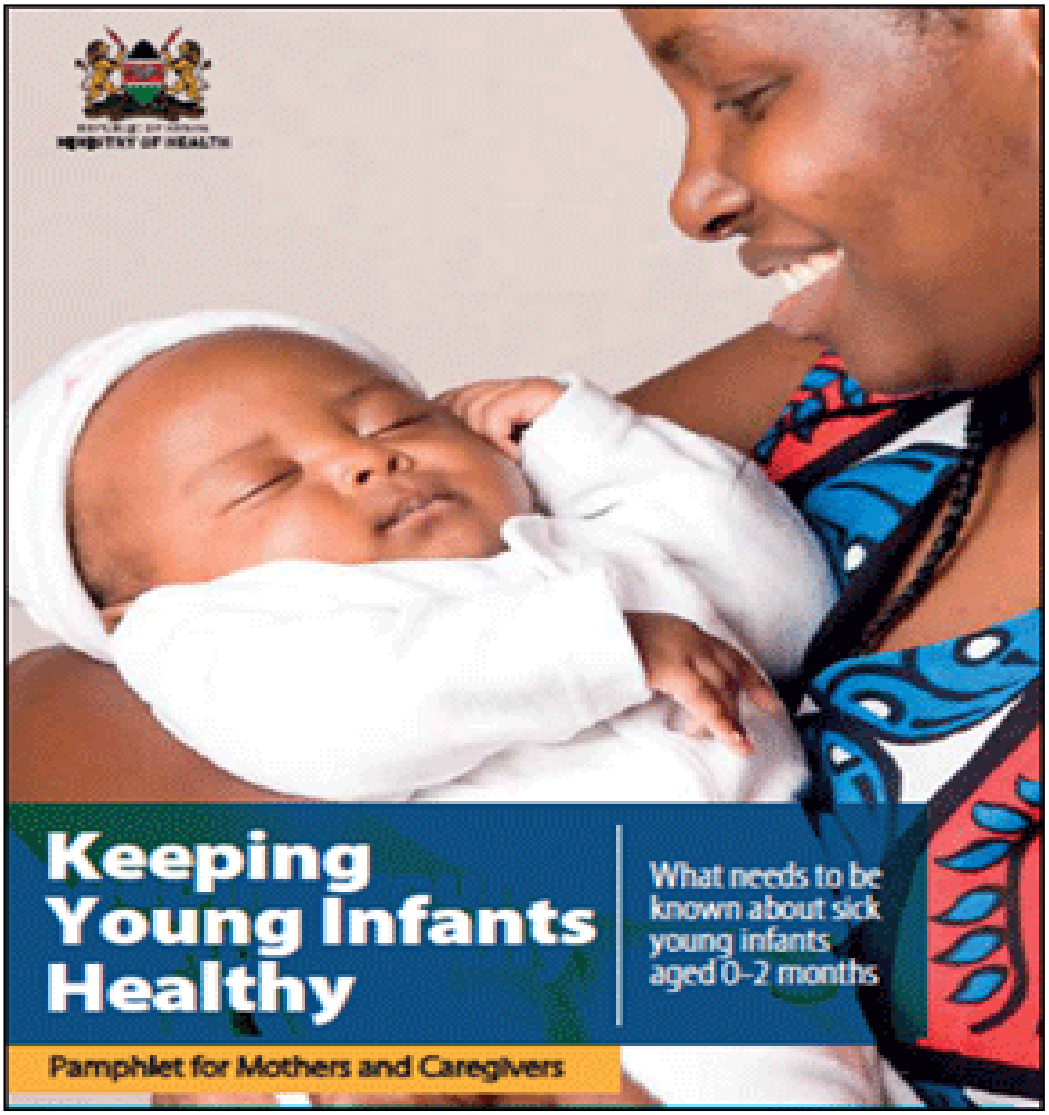


Figure 20: Caregiver Informational pamphlet

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

5.1.1 Organizational Health Systems Capacity

Sub-domain	Key issues and gaps	Recommendations to improve financing process
Policy Formulation and Planning	• Gaps in Policy formulation including strategies to support financing process. • Inadequate application of formal planning framework during the planning • Limited involvement of key stakeholders in policy development, planning and budgeting.	**Action point 1:** Counties should develop capacity building strategies for staff on budgeting, strategic planning and execution to a bigger team for sustainability even at sub county level via practical and theoretical skills through: a). Mentorship - intensive group assignment in which participants, guided by a mentorship team, develop, and present a strategic plan for a department or unit of their choice through a step-by-step analytical process. b) Experiential sharing across counties would be beneficial to learn from other good performing counties on the planning process **Action point 2:** Counties should enhance partnership: to leverage on existing funding from partners for newborn care.
Budgeting	• Limited understanding of the planning and budgeting process, structures, time lines and areas of input • Inadequate capacities to develop sound and credible PBBS and Plans	**Action point 1:** Counties should develop effective communication strategies on budgeting process and engagement between CHMT and lower levels and across the county health department **Action point 2:** Support the development and ensure availability of Planning, Budgeting, Monitoring and Reporting tools. This could be in the form of workbooks at all levels of management.
Execution and Reporting	• Lack of effective prioritization process in the budgeting cycle limiting funds to health sector • Chronic health sector underfunding that	**Action point 1:** Counties should Support the development of quarterly expenditure tracking tool/dashboard that will aid priority formulation. In addition to developing of CHMT and those at Sub county on prioritization process **Action point 2:** Counties should enhance

	affects ability to implement activities as per annual work plans. • Delays in receiving funds from county treasury • Limited involvement of key stakeholders in policy development planning and budgeting • Low budget execution	the process of reporting and budget approval process, improve communication between sectors and create structures for accessing funds from programs such as the Linda mama that can support newborn care service improvement

5.1.2 Leadership and Governance

Sub-domain	Key Issues and gaps	Recommendation to improve leadership
Governance and Leadership	• Weak managerial skills in areas of supervision, coordination of technical staff and activities (Mombasa, Turkana & Kilifi) • Knowledge gaps in succession management especially for the new managers at CHMT and SCHMT where there are no structured training of health leadership teams at all levels including orientation for new CHMT and SCHMT members (All sites) • None adherence to governance structures in place – (Bungoma & Mombasa) • Weakness in Linkages between County and Sub county structures- SCHMT are not well included in information from county to sub county (Turkana) • Lack of clear organogram outlining roles and responsibilities of CHMT and sub county level with lack of letters of appointment for SCHMT, lack of legislative framework or guidance for leadership, lack of harmonization of sub-county and county teams (Mombasa & Bungoma) • Inadequate communication between county health department and sub	**Action point 1:** Counties should institutionalize effective inductive system for new CHMT's and SCHMT's members on management of the sector as well as ensure practical training and mentorship with experienced managers for the CHMT and sub county and health facility in charges, organize change management and succession process at both the CHMT and SCHMT and other health programme managers **Action point 2:** Counties should domesticate structured organogram and operationalize them supported with clear

	counties without formal way of feedback between SCHMT and CHMT (Mombasa)	policies that are disseminated at levels
CHMT	• Limited performance management and review structures • Gaps in newborn care skills and equipment • Inadequate understanding of Universal Health Coverage	**Action point 1:** Counties should support the institutionalization of performance management review process and system **Action point 2:** Counties should align IMNCI training, with those of partners and strengthen supportive supervision for new born care-clinical audit or overall quality assurance for lower for levels
Sector and Stakeholder Coordination/ Partnership Management	• Inadequate development and stakeholder partners coordination structures including lack of partnership policies and guidelines • Weak PPPs arrangements to coordinate PPP's in the county health sector • Inadequate coordination of activities among the programs/ departments	**Action point 1:** Counties should support the development of a communication strategy for the county health departments where none exists **Action point 2:** Counties should seek establishment of a PPP office and liaison person to coordinate the external partnerships including capacity of county health staff on PPP's in healthcare. This will lead to effective mechanisms of strengthening consultation forums and partnership structures

5.1.3 HRH

Sub-domain	Key issues and gaps	Recommendations for improving HRH
Human resource planning & policy	• Weak HR governance structures – HR units with varying levels of staff to manage the department • Unclear HRH strategies and policies • Limited capacities to manage HRH functions as per norms exhibited by staffing of health facilities	**Action point 1:** Counties should designate HR staff specifically charged with HR as a primary duty at the sub-county level & high-volume facilities to facilitate the decentralization of HR issues for enhanced efficiency and quality HR service delivery. **Action point 2:** where absent counties should develop an HRH strategy with a clear job descriptions and job profiles that support providers **Action point 3:** Counties should link budgeting process with HRH needs and process such as supportive supervision to avoid overreliance with partners
Capacity to staff county health facilities as per national HRH norms	• Lack of effective implementation of a digital system/IHRIS for monitoring and tracking health workers • Inadequate staff for all cadres characterized by few newborn care providers to manage newborn or a balanced staff mix (Kilifi/Turkana) • Limited consultation with sub-county level with some roles for sub-county being taken up by the county (Turkana)	**Action point 1:** Counties should seek to effectively implement electronic HR system that will facilitate effective planning of HRH needs and track training of staff **Action point 2:** Counties should prioritize to support trainings on newborn care and seek to consult widely with sub counties on matters HRH
Capacity to strengthen staff performance management and supervision of existing workforce	• Inadequate policies and tools on staff performance appraisals and implementation at all levels of the health system • Inadequate financing for support supervision	**Action point 1:** Counties sold streamline implementation of a performance management system

Ability to attract, recruit and retain health workers	• Lack of an effective system for reward, retention and attracting recruitment and performance appraisal system • Staff turnover (Mombasa)	**Action point 1:** Counties should endeavour to develop and implement strategies to motivate providers at all levels of care
Training and capacity development programme	• Lack of effective training needs assessments strategy or coordination of in-service and pre-service training on HRH and inequitable distribution of training opportunities	**Action point 1:** Counties should support the establishment of a county health training committee and support the development a training database to effectively manage the training function to ensure a strengthened comprehensive training needs assessment system

5.1.4 Health Products and technologies

Sub domain	Key Issues	Recommendations for improving HPTs
Policy, Governance oversight and Commodity Security	• Dysfunctional/lack of governance structures for HPT management including functional HPT units, Medicines Therapeutics Committees • Budget gaps for commodities-supply done centrally with timings affecting the supply (Turkana, Bungoma & Kilifi) • Skills gaps in commodity forecasting and quantification (Bungoma, Turkana) • Inadequate storage for health commodities at all levels (Kilifi, Mombasa) • Lack/weak systems for monitoring health commodity inventory and stock levels including inadequate supportive supervision (Bungoma) • Lack of data use for planning (Turkana)	**Action point 1:** Counties should operationalize an HPT unit with competent staff and skills in developing effective forecasting plans and strategically advocating for resources **Action point 2:** Counties should ensure adequate linkages between budgeting process and HPT needs based on consumption and effective forecasting of needs **Action point 3:** counties should project storage facilities and incrementally plan for ways to develop adequate storage structures for good inventory practices and storage conditions

Logistics Management Information System (LMIS)	• Limited use of county LMIS system and supply chain data analytics and usage for decision making • Erratic supplies of commodities • Delays in delivering procured commodities • Lack/Weak supervision, monitoring, inventory management and re-distribution of commodities	**Action point 1:** Counties should develop a harmonized system of using data for decision making to manage inventory system well

5.1.5 Service Delivery

Sub domain	Key Issues and gaps	Recommendations for improving service delivery
Reproductive, maternal, neonatal child and adolescent health services provided	• Inadequate dissemination of guidelines to lower level facilities for RMNCH • Inadequate documentation of newborn services provided • Irregular supply of HPTs due to budget ceiling • Inadequate skilled staff to support newborn care • Unclear service arrangement for sick young infants • limited job aids on new born care • cultural hindrances to service use for newborns	**Action point 1:** Counties should develop an organized mechanism of distribution of polices, job aids and guidelines to all levels of care **Action point 2:** Facilities should innovatively develop ways to improve service arrangement for newborns who are at risk of dying easily e.g. through effective triaging
Service charters and its utility in the county health system	• Gap in updating and translating the service charters and patients' rights documents • Lack of an effective complaint's channels	**Action point 1:** Counties should contextualize accountability mechanism that ensure feedback to patient on service used
Supportive supervision structures and process	• Lack of effective supportive supervisory structures	**Action point 1:** Counties should effectively plan and budget for support supervision for both county and sub-county levels
Quality management	• Lack of a comprehensive quality improvement strategy • Non-functional quality improvement teams • Skill gaps in newborn care • congestion in facilities	**Action point 1:** counties should endeavour to improve strategies and operationalization of quality improvement strategy at levels of care

Referral strategies and process	• Non-operational referral strategic framework • Inefficient emergency and referral services including transport system	**Action point 1:** Counties should strengthen the referral systems with county- specific guidelines
Community health services	• Inadequate support for community health services especially the community health volunteers (CHVs) who are donor- dependent	**Action point 1:** Counties should ensure the CHD sets legal structures to incrementally allocate budget for the community health services component including advocacy process to relevant county structures

5.1.6 Health Infrastructure

Sub domain	Key Issues	Recommendations for improving infrastructure
Health infrastructure policies and standards	• Lack of strategic policy and investment plans for health infrastructure leading to disjointed development of infrastructure that requires huge resources to operationalize at expense of basic equipment for service delivery • Weak health infrastructure maintenance systems to meet norms and standards at health facilities • Lack of expertise in development of master plans for health facilities for future expansion	**Action point 1:** Counties need to develop ways of conducting a health infrastructure needs assessment and maintenance, biosafety and infrastructure planning and deployment. This will help in the implementation of a roadmap and investment plan for infrastructure development and rehabilitation to guide prioritization and rational investments **Action point 2:** counties should strengthen the implementation of the standard norms and guidelines for health infrastructure including the renovation, repair, and maintenance of equipment and implement M&E plan for health infrastructure
Infrastructure Development and Execution	• Skills gaps in use of modern technology especially for equipment donated through the national program as well as lack of spare parts to the machines • Weak involvement of engineering in procurement of equipment leading to equipment that do not meet specifications	**Action point 1:** counties should endeavour to plan and budget for capacity building and advocacy for local medical engineers to learn how to manage modern equipment

5.1.7 Health Information Systems

Sub-domain	Key issues	Recommendations for improving HMIS function
Routine data collection strategy in place	• Data collection system is still largely fragmented and manual • Low quality of data from point of collection • Inadequate reporting for private and FBO's health facilities	**Action point 1**: Counties should harmonize health information policies, strategies and systems at county, sub-county, health facility and community levels to promote collaboration and integration across the entire health system. This should also include strengthening infrastructure for HMIS and build capacity for data quality assurance
Essential tools and equipment for data management	• Data collecting tools are often unavailable • Lack of new born register at points of service use	**Action point 1**: Counties should plan and budget for funds for data collection tools. Register for newborn care should be developed and deployed
Guidelines to document procedures for collecting, recording, collating and reporting routine programme data	• Technical understanding of the indicators and its utility- limits documentation of the indicators- or ability to follow the instruction by front line providers as this is perceived as the domain of the records people or due to work load • Data demand use-challenges exists- at all levels- usually at the point of generation- lacks linkages between point of use-managers not keen for monitoring their programs	**Action point 1**: Counties should aim to establish county knowledge management for health platform that will: – Ensure planning informed by data – Strengthen links and mechanisms for exchange and networking between and among stakeholders – Strengthen the utilization of information at all levels of the system

5.1.8 M&E in all counties

Sub-domain	Key issues and gaps	Recommendations for improving M&E
Existing M&E unit or focal Person	• Lack of M&E specific strategic policies, frameworks and organizational structures to lead and operationalize M&E functions at the CDH level • Lack of analytical capacity of the M&E teams or links between the strategic plan and M&E	**Action point 1**: Counties should develop and institutionalize M&E structures
An inventory or database for programme evaluation	• No institutional tracking or history on previous evaluations done in the counties	**Action point 1:** Counties should strengthen routine systems for ensuring research and, evidence is documented and used for influencing decisions whenever they are conducted
Forums for dissemination and discussion of evaluation findings	• No forums for dissemination, explanation and discussion of county-level findings • Limited capacity for operational research and programme evaluation • Inadequate skills to develop policy briefs to inform policy development and implementation	**Action point 1**: counties should encourage partnership with local academic institutions or research institutes to mentor and build capacity in research and programme evaluation. This can help in dissemination strategies that are context-specific involving multi-sectoral forums county

Key gaps identified	Suggested solutions and recommendations for identified gaps
Plan organization and coordination for operationalizing management of SYI with PSBI where referral is not feasible in the context of existing MNCH programs, and ensure necessary policies are in place	
• Inadequate coordination of partners, programs or departments skewed towards maternal health and limited focus on newborn care	• Advocacy for counties to strengthen mechanisms of engaging partners with a view of developing partner data base and their focus area and align it with the AWP and CIDP, this would leverage on existing funding from partners for newborn care • Counties should support the development of a communication strategy for the county health departments where none exists to improve coordination and partnership
• Weak PPP arrangements to coordinate PPP's in the county health sector	• Counties should seek establishment of a PPP office and liaison person to coordinate external partnerships and enhance capacity of county health staff on PPPs in healthcare. This will lead to effective mechanisms of strengthening consultation forums and partnership structures
• Complex service arrangement in referral facilities for SYI • Multiple documentation of newborn data in various registers	• Facilities to strengthen services for SYI through triaging of very sick infants • Clear signage and creating an understanding of access for various service points for SYI among caregivers when they visit facilities • National government to fast-track piloting of the new neonatal register and explore effective ways of capturing data for all SYIs 0-59 days
• Uncoordinated referral process • Inefficient emergency services within the county and guidelines to support it	• Counties to ensure full implementation of the MOH Referral Strategy including allocating adequate funds to operationalize it
Plan for human resources to operationalize management of SYIs with PSBI in PHC facilities and communities	
Sub-optimal functionality of primary care facilities: • Limited operating hours for PHC facilities	• Facilities should develop localized strategies to ensure SYIs access 24 hours health care services
• Inadequate providers in PHC facilities and lack of specialized providers in referral facilities	• Advocacy for increased numbers of providers in PHC facilities and redistribution of HRH to ensure specialized care is available in referral facilities • IMNCI induction training and mentorship for front line providers to build confidence and

Key gaps identified	Suggested solutions and recommendations for identified gaps
	improve client-provider relations
• Poor provider attitudes and poor client-provider relationships	• Primary care facilities to re-organize service areas to expand newborn care functionality such as newborn areas and devise ways to strengthen PNC
• Inadequate equipment/space for managing SYIs at PHC facilities	• Improve infrastructure, equipment and supplies for newborn services; create and equip newborn units at facilities where appropriate
• Inadequate capacity of front-line providers to manage SYIs and limited availability of IMNCI trainings	• Develop strategies for continuous medical education on IMNCI using various approaches including OJT, distance learning, mentorship, gaming and feedback loops through treatment guidelines as well as localized practicum to ensure primary care providers can treat SYIs with new regimen • Distribution of revised guideline both hard copy and online versions and encourage utilization through use of clinical forms • Development and dissemination of provider job aids and clinical forms to institutionalize use of treatment protocol • Higher-level health facilities should provide supportive supervision and mentorship to lower level facilities
Weak HR governance structures: • County health departments (CPDs) do not have HR units/depts to manage human resource issues	• Counties should designate HR staff specifically charged with HR as a primary duty at the sub-county level & high-volume facilities to facilitate the decentralization of HR issues for enhanced efficiency and quality HR service delivery.
• Unclear HRH strategies and policies	• Counties should develop an HRH strategy with a clear job descriptions and job profiles. • Counties should link budgeting process with HRH needs and processes such as supportive supervision to avoid overreliance with partners
• Limited capacities to manage HRH functions as per norms exhibited by staffing of health facilities	• Counties should streamline implementation of a performance management system • Counties should develop and implement strategies to motivate providers at all levels of care
• Inadequate policies and tools on staff performance	• Counties should conduct training needs

Key gaps identified	Suggested solutions and recommendations for identified gaps
appraisals and implementation at all levels of the health system	assessments to identify skills gaps and training opportunities • Counties should support the establishment of a county health training committee and support the development a training database to effectively manage the training function
• Lack of an effective system for reward, retention and attracting recruitment personnel • Poor coordination of in-service and pre-service training on HRH and inequitable distribution of training opportunities • Lack of effective implementation integrated human resource information system (IHRIS) for monitoring and tracking health workers	• Counties should seek to effectively implement electronic HR system that will facilitate effective planning of HRH needs and track training of staff
Weak county leadership:	
• Lack of clear organogram and roles of various offices	• Counties should establish structured organogram with roles
• Poor change and succession management process at CHMT and SCHMT levels	• Counties should institutionalize effective induction for CHMT and SCHMT members with emphasis on change management and the succession process
• Weak communication and feedback mechanism between County and Sub-county HMTs.	• Counties should establish clearly defined communication and feedback channels for CHMTs, SCHMTs and HFMTs

Plan how the supply chain for each level of the health system will provide medicines and supplies for management of SYIs with PSBI

Key gaps identified	Suggested solutions and recommendations for identified gaps
• Stock outs of antibiotics or supplies to provide treatment such as syringes, etc. • Dysfunctional/lack of governance structures for health products and technologies (HPT) management • Limited use of county LMIS system and supply chain data analytics and usage for decision making • Weak supervision, monitoring, inventory management, delay in delivery and re-distribution of commodities for SYIs • Inadequate funds for commodities • Inadequate storage for health commodities at all levels	• Strengthen the forecasting, quantification, procurement, and distribution of essential commodities • Counties should operationalize an HPT unit with competent staff and skills in developing effective forecasting plans and strategically advocating for resources • Develop a harmonized system of using data for decision making to manage inventory system well. • Build the capacity of procurement and supply chain staff • Counties should ensure adequate linkages between budgeting process and HPT needs based on consumption and effective forecasting of needs • Counties should project storage facilities and incrementally plan for ways to develop adequate storage structures for good inventory practices and storage conditions
Plan how management of SYIs with PSBI will be operationalized as part of routine service delivery in PHC and referral facilities	
Weak quality improvement system: • Sub-optimal functionality of QIT-limited training, infrequent meetings • Inadequate infection control systems across all health facilities with a focus on dispensaries and health centers • Lack of a comprehensive quality improvement strategy	• Counties should set up and operationalize QITs in all health facilities with quarterly reporting to CHMTs • Strengthen the capacities of providers in infection control practices with emphasis on PHC facilities • Each health facility to develop and implement a quality improvement strategy with clear verifiable milestones
Negative perceptions of quality: • Dissatisfaction with newborn	• Create awareness on newborn health services in the community • Ensure continuous availability of drugs and

Key gaps identified	Suggested solutions and recommendations for identified gaps
health services • Lack of supplies and medicines • Disrespect and abuse • Delays in receiving treatment at the facility due to long queues/overcrowding	supplies for management of SYIs • Improve attitudes of healthcare providers • Create and equip newborn units in health facilities including PHC facilities • Health facilities to design local mechanism for triaging and fast-tracking handling of SYIs
Non-use of guidelines: • Inadequate dissemination of guidelines to lower-level facilities for RMNCH	• Counties should develop an organized mechanism of distribution of policies, job aids and guidelines to all levels of care
Plan strategies for working with individuals, families and communities to operationalize management of SYIs with PSBI at PHC facilities	
Community level gaps:	
• Inadequate number of CHVs	• Advocacy for developing mechanism of funding for Community health worker program
• Capacity gaps among CHVs to provide services for SYIs making it hard for them to reach newborns	• Build capacity of CHVs through trainings on newborn health with emphasis on identification of danger signs and counseling mothers on timely referral, and regular supportive supervision of CHVs • Develop a system for follow up using CHVs as referral agents and improve facility referral systems for day 4 and 8
• Limited funding to sustain community level activities • Transport and logistics for CHV affect service delivery at community level	• Counties should ensure to set legal structures to incrementally allocate budget for the community health services component including advocacy process to relevant county structures
• Limited job aids on new born care	• Strengthen CHVs as referral agents and improve facility referral systems • Support CHVs to create demand for prompt care seeking using job aids
• Cultural hindrances to service use for newborns	• Use CHV to ensure community messaging on common causes of illness tailored towards demystifying causes of illness
Family level gaps:	
• Delays in prompt care seeking for SYIs	• Increase community awareness on cause of newborn illness, need for prompt treatment including cord care practices • Counties should use local resources e.g. CHVs, TBAs and older women and other localized

Key gaps identified	Suggested solutions and recommendations for identified gaps
• Numerous barriers to care seeking for SYIs	champions for newborn care to advocate for prompt care for SYIs • Develop and utilize Information Education Communication Materials that contain simple message on care of infants targeting barriers to care seeking that can be used by various actors at community level
Plan supervision of management of SYIs with PSBI in PHC facilities; supervision of CHWs making home visits; and supervision of other community activities to support essential newborn care and care-seeking for newborn illness	
• Weak managerial skills in areas of supervision, coordination of technical staff and activities • Inadequate financing for support supervision	• Counties should effectively plan and budget for support supervision for both county and sub-county levels
Plan monitoring and evaluation of operationalizing management of SYIs with PSBI	
• Fragmented and manual data collection system • Lack of an enabling ICT infrastructure and equipment including computers	• Counties should harmonize health information policies, strategies and systems at county, sub-county, health facility and community levels to promote collaboration and integration across the entire health system.
• Low quality of data from point of collection	• Strengthen infrastructure for HMIS and build capacity for data quality assurance
• Inadequate reporting for private and FBOs health facilities	• Develop a supervision and monitoring plan for PSBI at all levels within the county
• Data collecting tools are often unavailable	• Counties should plan and budget for funds for data collection tools
• Limited capacity for data analysis, use and translation of information into knowledge products such as policy briefs to inform decision making	• Counties to build in-house capacity for data analysis, use and translation
• Sub-optimal use of existing guidelines for data collection and procedures	• Counties should aim to establish county knowledge management for health platform that will ensure that planning is informed by data
• Poor understanding of the indicators and their use limits	• Counties and sub-counties to build the capacity of their frontline providers and point of use

Key gaps identified	Suggested solutions and recommendations for identified gaps
documentation of the indicators by frontline providers • Low demand for data by point of use managers • Lack of M&E-specific strategic policies, frameworks and organizational structures • No institutional tracking on previous evaluations done in the counties • No forums for dissemination of county-level findings • Limited capacity for operational research and programme evaluation • Inadequate skills to develop policy briefs to inform policy development and implementation	managers on health indicators and the need for data • Counties should strengthen links and mechanisms for exchange of data and networking between and among stakeholder. • Strengthen the utilization of information at all levels of the system • Counties should develop and institutionalize M&E structures • Counties should strengthen routine systems for ensuring research and, evidence is documented and used for influencing decisions whenever they are conducted • Counties should encourage partnership with local academic institutions or research institutes to mentor and build capacity in research and programme evaluation. • Counties to establish dissemination strategies that are context-specific involving multi-sectoral forums county

National policy change

National advocacy interventions should be instituted to yield national policy support for stronger platforms for newborn care, PNC, and young infant care, including PSBI management and other maternal and newborn priorities.

Revision of the national IMNCI/PSBI guidelines should incorporate the management of SYIs with PSBI in the Newborn and Child Health Strategy 2021-2025. Based on these findings and the overall project data, the MoH revised the newborn registers to include IMNCI/PSBI indicators; the revised registers are now in use in health facilities countrywide. Similarly, the Ministry revised reporting tools for children under five years of age to include IMNCI/PSBI indicators in the DHIS2 platform. Lastly, IMNCI programs and activities have been incorporated into the Division of Neonatal and Child Health Annual Work Plan for the period 2021-2022.

Conclusions

The following conclusions were drawn following this implementation research study: Evidence from the implementation process in Kenya demonstrated that introducing and implementing the new IMNCI/PSBI guidelines is feasible, acceptable, and sustainable given high-level government support and commitment; institutionalizing IMNCI/PSBI services through provider capacity building, commodity supply chain, HMIS and functional QITs that are included in sub-county and facility workplans, budgets and procurement plans, ensured sustainability of service provision for SYIs; the evidence demonstrated that PHC providers are able to effectively manage SYIs with PSBI where referral is not possible if they have training and sufficient stock of the essential antibiotics; the revised national IMNCI/PSBI guidelines could result in an increase in utilization of services for the treatment of SYIs with PSBI; building the capacity of

CHVs on IMNCI/PSBI is critical in strengthening caregiver awareness of danger signs and facilitating prompt identification and referral of SYIs to health facilities; implementation research is a useful tool to guide programming in assisting county, subcounty and facility level teams to plan, track implementation, address emerging implementation challenges, and generate and document learnings to inform health service provision.

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APPENDICES

Appendix I: Informed Consent Form

Informed consent form for FGD/IDI

Title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General introduction

Good morning/afternoon. Thank you for taking the time to talk to me today. My name is _____. I am working with a consortium comprising of Mount Kenya University (MKU)Kenya Paediatric Association (KPA)/ Kenya Paediatric Research Consortium (KEPRECON) and Population council in close collaboration with the county and sub county health management teams.

We are conducting a study to assess how best to improve care given to newborns who are sick in Kenya.

You have been invited to take part in a research study. Before you decide whether to participate, you need to understand why the research is being done and what it would involve. Please take the time to read or to listen as I read the following information. You may talk to others about the study if you wish. Please ask me if there is anything that is not clear, or if you would like more information. When all your questions have been answered and you feel that you understand this study, you will be asked if you wish to participate in the study, and if yes to sign this Informed Consent form. You will be given a signed copy to keep.

Investigators

The study investigator is Samuel Mungai Mbugua from Mount Kenya University.

Study Location

The study is being conducted in Bungoma, Turkana, Kilifi and Mombasa Counties of Kenya.

Purpose of the Research

What is the study? The overall objective of the study is to demonstrate feasibility, acceptability and sustainability of implementation of the 2015 WHO PSBI guidelines in the revised IMNCI guidelines where referral is not feasible, in Kenyan representative settings

Why have I been invited to take part? You have been invited to participate in the study because you are a woman/man with an infant and you may have experiences of seeking care for the infant from this community.

Description of the Research

What will happen if I take part? If you agree to take part in the study, we will ask you to sign this form. You will also be asked to participate in a discussion about the process of seeking are for infants, treatments available and practices that of infant care in this community. With your permission, we will audio-tape the discussion so that the researcher does not have to write everything down.

How long will the interview last? The interview will last about one hour.

Risks

What are the risks of the study? An inconvenience may be the time and effort you take to participate in the study. A risk may be a breach of confidentiality (something you say is accidentally provided to others) but we will take precautions to see that this does not

happen. You are free to ask me to stop or decline to answer any questions that you are uncomfortable with.

Benefits

What are the benefits of participating? There are no direct benefits to you for participating in the study. You may find an indirect benefit in knowing that you participated in an important study that could inform policy on improving infant care in the county and other similar settings in Kenya.

Confidentiality

Will my participation in the study be kept confidential? The discussions with you is confidential and will be conducted in private. We will not record your name on the interview form. In addition, your responses will be combined with responses from community members so that no one will be able to identify your specific responses. This form will be kept under lock-and-key. The information gathered will be stored in a password-protected computer that only the study team can access. Your signature at the bottom of this form will not be used for any other purpose apart from proving that you have read or have been read to the information and that you have understood this information.

Voluntariness

What are my rights as a research participant/subject? Your participation in this study is completely voluntary. If you decide not to participate, you will not lose any existing benefits to which you are entitled. If you agree to participate in this study, you may end your participation at any time without penalty or loss of existing benefits to which you are entitled. You are free to withdraw from the study at any time.

Additional Information

What will I receive for participating? You will not receive any compensation for participating in the study.

What will happen to the results of the research study? The results of the study will be used to engage policymakers in Kenya on the best way to improve infant care when they seek care for illness. Policymakers within the county will also be made aware of care seeking practices and appropriate strategies to improve treatment for infants with bacterial infections. Study findings will be disseminated to a local, national and international audience, including but not limited to the governments and development partners on the best ways of ensuring infants with infection are treated well and on time. Dissemination activities will include publication of study findings, policy briefs, electronic dissemination and workshop events.

Who has reviewed the study for ethical issues? The Ethics Review Committee of Mount Kenya University has reviewed this study.

Contacts:

What if I need more information? If you have a concern about any aspect of the study, you should ask to speak to the researcher who will do their best to answer your questions. You may call Samuel Mbugua of Mount Kenya University P.O. Box 342-01000, Thika; Telephone: 0724561278.

What if there is a problem? Any complaint about the way you have been treated during the interview will be addressed. You may contact the MKU Ethics Review Committee Secretary, Dr. Francis Makokha Tel: 0722318247, Email: fmakokha@mku.ac.ke,

Would you be willing to participate in the study?

Yes ____ No ____

Respondent's statement: I have read or have been read to the above considerations regarding my participation in the study. I have been given a chance to ask any questions and my questions have been answered to my satisfaction. I understand that the information I give will be kept private. I understand that I may withdraw from this study any time. My withdrawal from the study or my refusal to participate will in no way affect my employment status. I agree to participate in this study as a volunteer.

_____ _____

Signature of respondent Date

Interviewer's declaration: I, _____, have explained to the respondent in a language she or he understands the procedures to be followed in this study, and the risks and benefits involved.

_____ _____

Signature of interviewer Date

_____ _____

Signature of witness (if any) Date

Appendix II: Qualitative data collection tools

4a: FGD guide for young women

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the FGDs.

I would like to thank each of you for agreeing to be a part of this focus group discussion. My name is …….. I will be leading the discussion session. My colleague here is …… will help in taking notes during the discussion. We also request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how your infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the FGD highlighting key observations from the discussion. This will later be used to write a report that will be used for improving the way newborns are treated.

Date of discussion:	Moderator:		
Venue:	Note-taker:		
Time start:	No. of Participants at start:		
Time discussion finished:	No of Participants at the end of discussion:		
Category of FGD:	Sub County (Name):		
Village/area:			
Participant/Interview Number	Age	Level of Education	No of children
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Key areas focus

1. Examine the current practices for infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?
2. Referral practices for sick infants- what happens when there is no referral, and how can they be sustainably met?
3. What support do women need when infant fall ill in remote settings?
4. How can we involve community health strategies in improving care for infants at home/community level? What tools do they need to help in that?
5. How can we improve family understanding of PSBI and related health threats, improve care-seeking; under what conditions, and why?
6. How does early newborn care, routine PNC, and young infant care function, and how can the strengthening of these platforms contribute to prevention and management of PSBI, and broader efforts to promote health and well-being of mother and infant?
7. What are the costs you incur while seeking care for sick infants-for families?

Main question	**Probes and follow on questions**
Q1. We will start by talking about your experiences while seeking treatment for infants aged between 0-59 days.	What is the typical care seeking process for infant illnesses in this community? **[Probe- What symptoms make you seek care? Are there** practices that may lead to illness in infants? If so which ones?

	Look for Socio-cultural practices at Household level **What do you do/try at home before seeking care? where do you go and why? who makes decisions on seeking care? How are these decisions made?** What is the role of other members of the family in care seeking for infant illness **[Probe for role of older women, mother in law, spouse other gate keepers /TBAs]**
Topic I: Utilization of infant care services and barriers to care seeking	
Q2. When you sought care for very sick infants can you describe to us how services are provided in this setting? **Focus on the experiential aspects of care seeking from a nearby facility**	What common illnesses do you seek services for? **[Probe for sepsis, problems with breathing others?]** How are services provided- [**Probe for treatment given during inpatient, how many days do you spend in facilities?**] Are there alternative ways in which the treatment can be given? If yes, please describe them. How accessible are these services: **[Probe for geographical access, cost, social barriers how can we improve utilization of services for sick**

	infants?]
Q3. What were your experiences when you sought infant care services at your nearest health facility?	**Do providers have resources for managing infant care? [Probe for availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days spent in hospital, scheduled visits for treatment versus in-patient visits)** **What are the advantages and disadvantages of treating infants as in patients or out patients** What barriers to you, as care-givers, experience in accessing post-natal care for infants- [**Probe for fear of disrespect/mistreatment of self or baby as barrier to PNC?** mother/families blamed during childbirth for not bringing newborn clothes/money or equipment? What treatment costs does PNC incur to a family? Any denial/being turned away of care because of lack of ability to pay?
Q4. What happens if the treatment cannot be given in the facility you first visited?	**When do women get referred for infant care- describe to us the common reasons for referral- (look for perceived serious illness, facility did not have the right equipment or supplies,**

	provider not available etc) What are the referral practices like- are you facilitated for referral? If yes, how does that happen in practice? **[Probe for transport arrangements, logistics of accessing next level of care, services provided, challenges of referral and how to improve)**
Q5. How can we improve family understanding of illnesses among infants?	What support do young women need to ensure timely access to care for infants How is the support needed different for older women? [**Probe-information on danger signs, where to seek care, reminders, facilitate access to care- what and how]** Who else in the family needs to understand and respond to infant illnesses?
Q6. What other barriers exist for seeking infant care?	**Probe for:** Knowledge gaps in the community around identifying child illnesses- why is there low awareness and what can be done to alleviate this problem? Cultural practices- what are the key cultural practices how do these practices affect care seeking? -delays on breast feeding due to rituals,

	cord care
Topic II: Cost of accessing infant care	
Q7. Tell us about the cost of accessing infant care? **USE THE TEMPLATE PROVIDED TO DETAIL THE COST FOR EACH GROUP**	[**Probe for what costs do caregivers incur if infant were admitted while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	
Q8. What are your views regarding use of community health volunteers in supporting infant care in the community?	What role can community health volunteers or other community level providers play in supporting infant care at community level? How connected to the community are CHVs? How does this impact their ability to support caregivers and infant care? Please explain. **[Probe for what role they can play-**

	information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; how can that be implemented, (targeting all infants for visits, where when how)]
Topic IV: Recommendations	
Q9. What suggestions do you have for improving the provision of infant care services in this community?	What are the ways in which infant care can be improved? Who should be involved in improving the infant care? **[Probe for role of older women, men, other gate keepers]** What type of platforms can be used to ensure young infant care is strengthened? How can these be used to promote health and well-being of mother and infant?

Appendix III: In Depth Interview guide for young mothers

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the in-depth interview with a young mother who has an infant with possible bacterial infection.

I would like to thank you for agreeing to be a part of this discussion. My name is ……. I will be leading the discussion session. We also request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how your infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the FGD highlighting key observations from the discussion. This will later be used to write a report that will be used for improving the way newborns are treated.

PART A: GENERAL INFORMATION

Name of the sub county/County:	
Type of participant:	
Time interview started:	
Time interview ended:	
Name of note taker:	
Name of interviewer:	
Script code:	

Key areas focus

1. Examine the current practices for infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?
2. Referral practices for sick infants- what happens when there is no referral, and how can they be sustainably met?
3. What support do women need when infant fall ill in remote settings?
4. How can we involve community health strategies in improving care for infants at home/community level? What tools do they need to help in that?
5. How can we improve family understanding of PSBI and related health threats, improve care-seeking; under what conditions, and why?
6. How does early newborn care, routine PNC, and young infant care function, and how can the strengthening of these platforms contribute to prevention and management of PSBI, and broader efforts to promote health and well-being of mother and infant?

7. What are the costs you incur while seeking care for sick infants-for families?

Main question	**Probes and follow on questions**
Q1. We will start by talking about your experiences while seeking treatment for your infant when she/he fell sick.	Please describe how you sought care for your baby's illness? **[Probe- What symptoms made you seek care? Conditions infant had-sepsis, problems with breathing others?]** Are there socio-cultural practices that may have led to illness in infants in your community? If so which ones? **What did you do/try at home before seeking care? where did you go and why? who made the decisions on seeking care? How were these decisions made?** How did other members of the family influence your care seeking for the infant while it was sick **[Probe for role of older women, mother in law, spouse other gate keepers /TBAs]**
Topic I: Utilization of infant care services	
Q2. When you sought care for the sick infant can you describe to us how services were provided?	How were services provided- [**Probe for treatment given during inpatient, how many days do you spend in facilities?**] Are there alternative ways in which the treatment

	can be given? If yes, please describe them. How accessible were services you received for infant care: **[Probe for geographical access, cost, social barriers how can we improve utilization of services for sick infants?]**
Q3. Let us now talk about the facility that you visited for your infant, what was your experiences when you sought infant care services at facility (name facility)?	**Did providers have resources for managing infant care? [Probe for availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days spent in hospital, possible scheduled visits for treatment versus in patient visits)** **What are the advantages and disadvantages of treating infants as in patients or out patients**
Q4. What happens if the treatment that you sought for could not be given in the facility you first visited?	What are the referral practices like- are you facilitated for referral? If yes how does that happen in practice? **[Probe for transport arrangements, logistics of accessing next level of care, services provided, challenges of referral and how to improve)** **What are the common reasons for referral- cases that you are often referred- what facility are you referred to and why?**

Q5. How can we improve family understanding of illnesses among infants?	What support do young women need to ensure timely access to care for infants How is the support needed different for older women? [**Probe-information on danger signs, where to seek care, reminders, facilitate access to care-what and how]** Who else in the family needs to understand and respond to infant illnesses?
Topic II: Cost of accessing infant care	
Q6. What costs did you incur while seeking care for the infant? **USE THE TEMPLATE PROVIDED TO DETAIL THE COST FOR EACH PARTICIPANT**	[**Probe for what costs do caregivers incur if infant were admitted while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	
Q7. What are your views regarding	What role can community health volunteers or

use of community health volunteers in supporting infant care in the community?	other community level providers play in supporting infant care at community level? How connected to the community are CHVs? How does this impact their ability to support caregivers and infant care? Please explain. **[Probe for what role they can play- information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; how can that be implemented, (targeting all infants for visits, where when how)]**
Topic IV: Recommendations	
Q8 What suggestions do you have for improving the provision of infant care services in this community	What are the ways in which infant care can be improved? Who should be involved in improving the infant care? **[Probe for role of older women, men, other gate keepers]** What type of platforms can be used to ensure young infant care is strengthened?

	How can these be used to promote health and well-being of mother and infant?

Appendix IV: Focus Group Discussion guide for older women

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the FGDs.

I would like to thank each of you for agreeing to be a part of this focus group discussion. My name is ……. I will be leading the discussion session. My colleague here is called …… will help in taking notes during the discussion. We also request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how your infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the FGD highlighting key observations from the discussion. This will later be used to write a report that will be used for improving the way newborns are treated.

Date of discussion:	Moderator:		
Venue:	Note-taker:		
Time start:	No. of Participants at start:		
Time discussion finished:	No of Participants at the end of discussion:		
Category of FGD:	Sub County (Name):		
Village/area:			
Participant/Interview Number	Age	Level of Education	No of children
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Key areas focus

1. Examine the current practices for infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?

2. Seek to understand the role of older women in influencing care seeking for infants- how do they influence and why? What can be done to improve their roles?
3. Referral practices for sick infants- what happens when there is no referral, and how can they be sustainably met?
4. Explore the support women need when infants fall ill in remote settings
5. How can we involve community health strategies in improving care for infants at home/community level? What tools do they need to help in that?
6. How does early newborn care, routine PNC, and young infant care function, and how can the strengthening of these platforms contribute to prevention and management of PSBI, and broader efforts to promote health and well-being of mother and infant?
7. Explore the costs caregivers incur while seeking care for sick infants-for families

Main question	Probes and follow on questions
Q1. We will start by talking about your experiences while seeking treatment for infants aged between 0-59 days.	What is the typical care seeking process for infant illnesses in this community? **[Probe- What symptoms make you seek care? Are there** practices that may lead to illness in infants? If so which ones? Look for Socio-cultural practices at Household level **What do you do/try at home before seeking care? where do you go and why? who makes decisions on seeking care? How are these decisions made?** What is the role of other members of the family in care seeking for infant illness **[Probe for role of older women, mother in law, spouse other gate keepers /TBAs]**
Topic I: Utilization of infant care services and barriers to care seeking	
Q2. When you sought care for very sick infants can you describe to us how services are provided in this setting? **Focus on the experiential aspects of care seeking from a nearby facility**	What common illnesses do you seek services for? **[Probe for sepsis, problems with breathing others?]** How are services provided- [**Probe for treatment given during inpatient, how many days do you spend in facilities?**] Are there alternative ways in which the treatment can be given? If yes, please describe them. How accessible are these services: **[Probe for geographical access, cost, social barriers how can we improve utilization of services for sick**

	infants?]
Q3. What were your experiences when you sought infant care services at your nearest health facility?	**Do providers have resources for managing infant care? [Probe for availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days spent in hospital, scheduled visits for treatment versus in-patient visits)** **What are the advantages and disadvantages of treating infants as in patients or out patients** What barriers to you, as care-givers, experience in accessing post-natal care for infants- [**Probe for fear of disrespect/mistreatment of self or baby as barrier to PNC?** mother/families blamed during childbirth for not bringing newborn clothes/money or equipment? What treatment costs does PNC incur to a family? Any denial/being turned away of care because of lack of ability to pay?
Q4. What happens if the treatment cannot be given in the facility you first visited?	**When do women get referred for infant care- describe to us the common reasons for referral- (look for perceived serious illness, facility did not have the right equipment or supplies, provider not available etc)** What are the referral practices like- are you facilitated for referral? If yes, how does that happen in practice? **[Probe for transport arrangements, logistics of accessing next level of care, services provided, challenges of referral and how to improve)**

Q5. How can we improve family understanding of illnesses among infants?	What support do young women need to ensure timely access to care for infants How is the support needed different for older women? [**Probe-information on danger signs, where to seek care, reminders, facilitate access to care-what and how]** Who else in the family needs to understand and respond to infant illnesses?
Q6. What other barriers exist for seeking infant care?	**Probe for:** Knowledge gaps in the community around identifying child illnesses- why is there low awareness and what can be done to alleviate this problem? Cultural practices- what are the key cultural practices how do these practices affect care seeking? -delays on breast feeding due to rituals, cord care
Topic II: Cost of accessing infant care	
Q7. Tell us about the cost of accessing infant care? **USE THE TEMPLATE PROVIDED TO DETAIL THE COST FOR EACH GROUP**	[**Probe for what costs do caregivers incur if infant were admitted while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	

Q8. What are your views regarding use of community health volunteers in supporting infant care in the community?	What role can community health volunteers or other community level providers play in supporting infant care at community level? How connected to the community are CHVs? How does this impact their ability to support caregivers and infant care? Please explain. **[Probe for what role they can play- information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; how can that be implemented, (targeting all infants for visits, where when how)]**
Topic IV: Recommendations	
Q9. What suggestions do you have for improving the provision of infant care services in this community?	What are the ways in which infant care can be improved? Who should be involved in improving the infant care? **[Probe for role of older women, men, other gate keepers]** What type of platforms can be used to ensure young infant care is strengthened? How can these be used to promote health and well-being of mother and infant?

Thank you for participating.

Appendix V: Focus Group Discussion Guide for married men

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the FGDs.

I would like to thank each of you for agreeing to be a part of this focus group discussion. My name is …….. I will be leading the discussion session. My colleague here is called …… will help in taking notes during the discussion. We also request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how your infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the FGD highlighting key observations from the discussion. This will later be used to write a report that will be used for improving the way newborns are treated.

Date of discussion:	Moderator:		
Venue:	Note-taker:		
Time start:	No. of Participants at start:		
Time discussion finished:	No of Participants at the end of discussion:		
Category of FGD:	Sub County (Name):		
Village/area:			
Participant/Interview Number	Age	Level of Education	No of children
1			
2			
3			
4			
5			
6			
7			
8			
9			

Key areas focus

1. Examine the current practices for infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?

2. Referral practices for sick infants- what happens when there is no referral, and how can they be sustainably met?

3. What support do women need when infant fall ill in remote settings?

4. How can we involve community health strategies in improving care for infants at home/community level? What tools do they need to help in that?
5. How can we improve family understanding of PSBI and related health threats, improve care-seeking; under what conditions, and why?
6. How does early newborn care, routine PNC, and young infant care function, and how can the strengthening of these platforms contribute to prevention and management of PSBI, and broader efforts to promote health and well-being of mother and infant?
7. What are the costs you incur while seeking care for sick infants-for families?

Main question	**Probes and follow on questions**
Q1. We will start by talking about your family experiences while seeking treatment for infants	How would you generally describe care seeking for infant illnesses in this community? **[Probe- What symptoms make you seek care?** Are there practices that may lead to illness in infants? If so which ones? **What do you at home before seeking care? where do you go and why? who makes decisions on seeking care? How are these decisions made?** What is the role of other members of the family in care seeking for infant illness **[Probe for role of older women, mother in law, wife/spouse other**

	gate keepers such as TBAs]
Q2 Can you describe to us the role men in care seeking practices for infants in this community?	What role do men play at the family level in care seeking for infant illness **[Probe for role of men, when are they consulted and how?]** How do they influence care seeking for infants- why? How can we use these roles/influence to improve care seeking for infants? What can be done to improve/optimize their role in supporting women for care seeking for young infants **[Probe for do they want to be involved if not why if yes how)** What role does culture play in facilitating men to support their women during care for infants?
Topic I: Utilization of infant care services	
Q3. When you seek care for very sick infants can you describe to us how services are provided in this setting?	What common illnesses do you seek services for? **[Probe for sepsis, problems with breathing others?]** How are services provided- [**Probe for treatment given during inpatient, how many days do you spend in facilities?**] Are there alternative ways in which the treatment

	can be given? If yes how can this be improved? How accessible are these services: **[Probe for geographical access, cost, social barriers how can we improve utilization of services for sick infants?]**
Q4. What were your experiences when you sought infant care services at your nearest health facility?	**Do providers have resources for managing infant care? [Probe for availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days spent in hospital, possible scheduled visits for treatment versus in patient visits- what are the advantages and disadvantages of each approach)**
Q5. What happens if the treatment cannot be given in the facility you first visited?	What are the referral practices like- are you facilitated for referral? If yes how does that happen in practice? **[Probe for transport arrangements, logistics of accessing next level of care, services provided, challenges of referral and how to improve)** **What are the common reasons for referral- cases that you are often referred- what facility are you referred to and why?**

Q6. How can we improve family understanding of illnesses among infants?	What support do men need to ensure timely access to care for infants [**Probe-information on danger signs, where to seek care, reminders, facilitate access to care- what and how]**
Topic II: Cost of accessing infant care	
Q7. Tell us about the cost of accessing infant care	[**Probe for what costs do caregivers incur if infant were admitted while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	
Q8. What are your views regarding use of community health volunteers in supporting infant care in the community?	What role can community health volunteers play in supporting infant care at community level? **[Probe for what role they can play- information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; how can that be**

	implemented, (targeting all infants for visits, where when how)]
Topic IV: Recommendations	
Q9 What suggestions do you have for improving the provision of infant care services in this community	What are the ways in which infant care can be improved? Who should be involved in improving the infant care? **[Probe for role of older women, men, other gate keepers]** What type of platforms can be used to ensure young infant care can be strengthened? How can this be used to promote health and well-being of mother and infant?

Thank you for participating.

Appendix VI: In Depth Interview Guide for Community Health Volunteers

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the in-depth interview with active CHVs

I would like to thank you for agreeing to be a part of this discussion. My name is …….. I will be leading the discussion session. I kindly request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the discussions highlighting key observations from the session. This will later be used to write a report to use for improving the way newborns are treated.

PART A: GENERAL INFORMATION

Name of the sub county/County:	
Position of the respondent:	
Gender:	
Time interview started:	
Time interview ended:	
Name of note taker:	
Name of interviewer:	
Script code:	

Key areas focus

1. Examine the current practices for infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?
2. Referral practices for sick infants- what happens when there is no referral, and how can they be sustainably met?
3. What support do CHVs need to influence care seeking for infants in remote settings?
4. How can we involve community health strategies in improving care for infants at home/community level? What tools do they need to help in that?
5. How can we improve family understanding of PSBI and related health threats, improve care-seeking; under what conditions, and why?
6. How does early newborn care, routine PNC, and young infant care function, and how can the strengthening of these platforms contribute to prevention and

management of PSBI, and broader efforts to promote health and well-being of mother and infant?

7. What are the costs you incur while seeking care for sick infants-for families?

Interview Guide Questions

Questions	**Probe (s)**
Q1. Please describe your general responsibilities in this community as a community health volunteer?	What are the normal routine services that you provide to support community health services? **[Probe for role in supporting MNH issues and infant care]**
Q2. What are some of the infant care practices in this County?	[**Probe: Are there cultural practices that may lead to illness in infants? If so which ones?** **What can be done to ensure the communities change to safe practices?**
Topic I: Utilization of infant care services	
Q3. We will start by talking about your experiences in supporting women in this community to seek treatment for infants	How would you generally describe care seeking for infant illnesses in this community? **[Probe- What symptoms make caregivers seek care? When do they seek care and why?]** **What do caregivers do at home before seeking care? where do you they go for care and why? who makes decisions on seeking care? How are these decisions made?**

	What is the role of other members of the family in care seeking for infant illness in this community **[Probe for role of older women, mother in law, wife/spouse other gate keepers such as TBAs]** In your opinion, what factors influence the decision on whether to and where to seek care for infants?
Q4 Can you describe to us the role men in care seeking practices for infants in this community?	What role do men play at the family level in care seeking for infant illness **[Probe for role of men, when are they consulted and how?]** How do they influence care seeking for infants-why? How can we use these roles/influence to improve care seeking for infants? What can be done to improve/optimize their role in supporting women for care seeking for young infants **[Probe for do they want to be involved if not why if yes how)** What role does culture play in facilitating men to support their women during care for infants?
Q5. Tell us about the experiences of caregivers when they seek infant	**Do providers have resources for managing infant care? [Probe for availability of**

care services at their nearest health facility?	**services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days spent in hospital, possible scheduled visits for treatment versus in patient visits- what are the advantages and disadvantages of each approach)**
Q6. What happens if the treatment cannot be given in the facility the caregivers first visit?	What are the referral practices like- are they facilitated for referral? If yes how does that happen in practice? **[Probe for transport arrangements, logistics of accessing next level of care, services provided, challenges of referral and how to improve)** **What are the common reasons for referral- cases that you are often referred for- what facility are they referred to and why?** What are the key transport challenge for referral of infant medical emergencies in this county? In your view how can the referral challenge be addressed given the scarce budget?
Topic II: Cost of accessing infant care	
Q7. Tell us about the cost of	[**Probe for what costs do caregivers incur if infant were admitted while sick- what do they**

accessing infant care	**pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	
Q8. What are your views regarding use of community health volunteers in supporting infant care in the community?	What role can community health volunteers play in supporting infant care at community level? **[Probe for what role they can play- information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; how can that be implemented, (targeting all infants for visits, where when how)]**
Topic IV: Recommendations	
Q9 What suggestions do you have for improving the provision of infant care services in this community	What are the ways in which infant care can be improved? Who should be involved in improving the infant care? **[Probe for role of older women, men,**

	other gate keepers] What type of platforms can be used to ensure young infant care can be strengthened? How can this be used to promote health and well-being of mother and infant? In your opinion, please describe to us what strategy (s) may be adopted to enhance access and utilization of maternal and newborn care services in this county

Appendix VII: Case narrative guide for women using PSBI

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the case narrative

I would like to thank you for agreeing to be a part of this study. My name is …….. I will be leading the discussion session. We also request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand your experiences of seeking for an infant that was unwell in the last six months. We would also like to learn how your infants were treated when they had an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports after the discussion highlighting key observations from this experience. This will later be used to write a report that will be used for improving the way newborns are treated.

Part A: General Information

Name of the sub county/County:	
Type of participant:	
Time interview started:	
Time interview ended:	
Name of note taker:	
Name of interviewer:	
Script code:	

Key areas focus

1. Examine the experiences of infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?
2. Account of community-facility referral practices for sick infants- what happens when they were referred from community for PSBI management?
3. Nature of involvement of community health strategies in improving care for infants at home/community level? What has improved over time
4. Account of the functioning of early newborn care, routine PNC, and young infant care, and how can the strengthening of these platforms contribute to prevention and management of PSBI, and broader efforts to promote health and well-being of mother and infant?
5. Account of cost incurred while seeking care for sick infants-for families?

Main question	**Probes and follow on questions**

Q1. Tell us your experience of seeking care for your infant who was unwell	Tell us the story of what happened when your baby was unwell **[Probe- What symptoms did the baby exhibit what prompted her to seek care? Is there anything she did at home before seeking care? where do you go and why? who made decisions on seeking care? How were these decisions made?]** Were there any role that other members of the family played in influencing how and where you sought care- including timing **[Probe for role of older women, mother in law, spouse other gate keepers /TBAs]**
Q2. When you sought care for your baby can you describe to us how services were provided for baby **xxxx**?	How was the baby treated? What was the baby treated for **[Probe for sepsis, problems with breathing others?]** How were services provided- [**Probe for treatment given at the outpatient, how many days do you come to complete the dosages?**] What did you think about the outpatient services you used for treatment of your baby compared to inpatient What challenges did you experience while seeking

	care for your baby using this approach- **[Probe for geographical access, cost, social barriers, facility barriers? - availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for structured schedule of treatment, what are the advantages and disadvantages of each approach)**
Q3. For those who were referred by community health worker- give us your experiences of seeking care?	How was the encounter with CHV that led you to seek care in the facility XXX? **[Probe for hat CHV did, arrangement made in terms of transport arrangements, logistics of accessing next level of care, services provided, challenges of referral and how to improve)** What other support do young women need to ensure timely access to care for infants [**Probe- information on danger signs, where to seek care, reminders, facilitate access to care- what and how]**
Q4. Tell us about the cost of accessing infant care	[**Probe for what costs do caregivers incurred if infant were admitted while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made**

	for what and how were payments made] Other social costs? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Q5. What are your views regarding use of community health volunteers in supporting infant care in the community?	Share with us your experiences of involving CHV in supporting infant care at community level? **[Probe for what role they play -information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; how can that be implemented, (targeting all infants for visits, where when how)]**
Q6 What suggestions do you have for improving the provision of infant care services in this community	What are the ways in which infant care can be improved? Who should be involved in improving the infant care? **[Probe for role of older women, men, other gate keepers]** What type of platforms can be used to ensure young infant care can be strengthened? How can this be used to promote health and well-

	being of mother and infant?

Thank you for participating.

Appendix VIII: In Depth Interview follow up guide for front line providers

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the in-depth interview with front line providers.

I would like to thank you for agreeing to be a part of this discussion. My name is ……. I will be leading the discussion session. I kindly request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the discussions highlighting key observations from the session. This will later be used to write a report to use for improving the way newborns are treated.

Part A: General Information

Name of the sub county/County:	
Position of the respondent:	
Professional training, type and duration	
Current role in the health system	
Current and usual duties in relation to newborn care	
Gender:	
Time interview started:	
Time interview ended:	
Name of note taker:	
Name of interviewer:	
Script code:	

Key areas focus

1. Examine the changing practices for infant care- how do care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?
2. What support do providers need to influence care seeking for infants in remote settings?
3. How can we involve community health strategies in improving care for infants at home/community level? What tools do they need to help in that?
4. How can we improve family understanding of PSBI and related health threats, improve care-seeking; under what conditions, and why?
5. How does early newborn care, routine PNC, and young infant care function, and how can the strengthening of these platforms contribute to prevention and

management of PSBI, and broader efforts to promote health and well-being of mother and infant?

6. What are the costs you incur while seeking care for sick infants-for families?

Interview Guide Questions

Questions	**Probe (s)**
Q1. Please describe the general changes you have seen over time while providing service to communities in this setting?	What changes have you noticed at facility level regarding care seeking for infants while they are sick? **[Probe for what has caused the changes if any and why, nature of changes]**
Q2. What are the contextual issues that may be facilitating or constraining infant care series in this County that?	Probe for contextual factors constraining service coverage, utilization or quality- **Are supplies and commodities, human resources, management or governance factors others? If so which ones?** **Enabling environment**-, supplies, supports and tools-, health teams and management, enabling environment and support services **Financial factors** for health staff or clients Recent changes in social, cultural, economic or physical context Of all factors which is the most significant changes or outcomes and reasons for ranking

	What can be done to improve/ensure the facilities respond well to the management of infant are?
Topic I: Understanding constituents of quality care	
Q3. Compare now and before this project, what changes do you notice among caregivers on care seeking for infant illnesses in this community?	**[Probe- changes in accepting PSBI management approach when do they seek care and why?]** **What do caregivers do at home before seeking care? where do you they go for care and why? Are there adhering to subsequent treatment schedule?** In your opinion, what is influencing whether they complete treatment for infants?
Q4. Comparing now and before project, what changes have you observed at facility level in terms of how caregivers are treated when they seek infant care services at their nearest health facility?	**Do providers have resources for managing infant care? [Probe for availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days scheduled for treatment, possible scheduled visits for treatment versus in patient visits- what are the advantages and disadvantages of each approach)**

Topic II: Cost of accessing infant care	
Q5. What are rare current cost of accessing infant care	[**Probe for what costs do caregivers incur if infant were scheduled for visits while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? Any changes that has been observed over time? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	
Q6. In your experience as a provider, how has your role changed in supporting infant care in the facility?	What new roles have you acquired in supporting infant care at the facility? **[Probe for how they feel about the roles, -role in information sharing on scheduled visits, enabling community level providers to support o PSBI, linkages with facility for outpatient services, support referral; (targeting all infants for visits, where when how)]** What is your experience of using the support tools

	at facility level?
Topic IV: Recommendations	
Q7 What suggestions do you have for improving the provision of infant care services at the facility level?	What are the ways in which infant care can be improved? What areas of improvement are needed? **[linkages with facility, management of PSBI cases, others]**

Appendix IX: In Depth Interview guide for Community Health Volunteer-follow up

Project title: **SITUATIONAL ASSESSMENT OF HEALTH SYSTEMS IN THE MANAGEMENT OF POSSIBLE SEVERE BACTERIAL INFECTION AMONG YOUNG INFANTS IN KENYA**

General Introduction

Please identify a private setting for the in-depth interview with active CHVs. I would like to thank you for agreeing to be a part of this discussion. My name is ……. I will be leading the discussion session. I kindly request you to allow the session to be audio-taped so that we do not miss any of the ideas. The purpose of conducting this discussion is to understand the process of care seeking and practices for managing infant illness. We would also like to learn how infants are treated when they have an infection. We would wish to inform you that there are no wrong or right answers in this discussion. Please be assured that your personal details or what you say as a person will not be used at any time. What you say is therefore confidential and anonymous. We will ensure confidentiality about all the information discussed. This discussion will also be anonymous – your names will not be recorded in the notes; rather we shall assign codes to the names. You are therefore encouraged to participate actively and to feel free during the discussion. The team will produce field reports immediately after the discussions highlighting key observations from the session. This will later be used to write a report to use for improving the way newborns are treated.

Part A: General Information

Name of the sub county/County:	
Position of the respondent:	
Gender:	
Time interview started:	
Time interview ended:	
Name of note taker:	
Name of interviewer:	
Script code:	

Key areas focus

1. Examine the changes on practices for infant care-what changes has occurred over time on how care givers seek care for their infant, what do they do at home before seeking care? how can we improve utilization of services for sick infants?
2. Referral practices for sick infants- what changes are we seeing when there is no referral, and how can they be sustainably met?
3. What further support do CHVs need to influence care seeking for infants in remote settings?
4. What changes do we need to sustain if we involve community health strategies in improving care for infants at home/community level? What response do they have for the tools that are being used at that level to help in that?
5. What improvements need to be instituted to improve family understanding of PSBI and related health threats, improve care-seeking; under what conditions, and why?

6. What changes are currently happening for early newborn care, routine PNC, and young infant care, and how can the strengthening of these platforms contribute to prevention and management of PSBI, and broader efforts to promote health and well-being of mother and infant?

7. What are the costs you incurred while seeking care for sick infants-for families?

Interview Guide Questions

Questions	**Probe (s)**
Q1. Please describe the general changes you have seen over time while providing service to communities as a community health volunteer?	What changes have you noticed at community level regarding care seeking for infants while they are sick? **[Probe for what has caused the changes if any and why]**
Q2. Are there changes on infant care practices in this County that you have noticed?	[**Probe: Are there cultural practices that are slowly being abandoned when infants are unwell? If so which ones?** **What can be done to improve/ensure the communities change to safe practices?**
Topic I: Utilization of infant care services	
Q3. Compare now and before this project, what changes do you notice among caregivers on care seeking for infant illnesses in this	**[Probe- changes on symptoms that make caregivers seek care? When do they seek care and why?]** **What do caregivers do at home before seeking**

community?	**care? where do you they go for care and why? who makes decisions on seeking care? How are these decisions made?** In your opinion, what factors influence the decision on whether to and where to seek care for infants?
Q4 Are there any improvements seen on how men are involved in care seeking practices for infants in this community?	What changes have you observed the family level in care seeking for infant illness **[Probe for what has changed if any on the role of men, when are they consulted and how?]** What can be done to improve/optimize their role in supporting women for care seeking for young infants **[Probe for do they want to be involved if not why if yes how)**
Q5. Comparing now and before project, what changes have you observed at facility level in terms of how caregivers are treated when they seek infant care services at their nearest health facility?	**Do providers have resources for managing infant care? [Probe for availability of services, experienced staff, supplies]** What needs to be done to improve care given to infant while they are sick. **[Probe for days spent in hospital, possible scheduled visits for treatment versus in patient visits- what are the advantages and disadvantages of each approach)**

Topic II: Cost of accessing infant care	
Q6. What are rare current cost of accessing infant care	[**Probe for what costs do caregivers incur if infant were admitted while sick- what do they pay for -- commodities, fees, other payments (under-the-table fees)? – if payment were made for what and how were payments made]** Other social costs? Any changes that has been observed over time? [**Probe for whether services caregivers perceive other costs - time away from families, taking care of other family members, separation, economic activities at home**
Topic III: Community health services and infant care	
Q7. In your experience as a community health volunteer, how has your role changed in supporting infant care in the community?	What new roles have you acquired in supporting infant care at community level? **[Probe for how they feel about the roles, -role in information sharing on danger signs for illness, linkages with facility for outpatient services, support referral; (targeting all infants for visits, where when how)]** What is the experience of using the support tools at community level?

Topic IV: Recommendations	
Q8 What suggestions do you have for improving the provision of infant care services in this community	What are the ways in which infant care can be improved? What areas of improvement are needed? **[linkages with facility, management of PSBI cases, others]**

Appendix X: Quantitative data collection tools

PSBI FACILITY QUESTIONNAIRE

Facility audit for assessing facility readiness to manage possible severe bacterial infections

County			
Sub County:			
Facility name:			
	Type	**Code**	
Facility type	County Referral Hospital	01	
	Sub-county hospital	02	
	Health centre	03	
	Dispensary	04	
	Clinic (private/faith based)	05	
	Nursing home	06	
	Other (specify)	88	[___|___]
Facility Tier	Tier 1 (Community, dispensary, health center)	01	
	Tier 2 (Sub-county)	02	
	Tier 3 (County)	03	[___|___]

	Tier 4 (Tertiary/National referral)	04	
Managing agency	Government	01	
	NGO	02	
	Private	03	
	Faith-based/mission/church	04	
	Other (specify)	88	[___|___]
Official opening Hours	Monday to Friday 08.00 - 17.00	01	
	Monday to Saturday 08.00 – 17.00	02	
	Monday to Sunday 08.00-17.00	03	[___|___]
	24 hours seven days a week	04	
	Other specify	88	
Interview outcomes	Completed	01	
	Partially completed	02	[___|___]
	Refused	03	
	Other specify	88	
INTERVIEW DATE(DAY, MONTH, YEAR E.G. 02/06/18		[___|___/___|___/___|___]	
Interviewer's			

SECTION 1: BASIC INFRASTRUCTURE

Preferred Respondent: Facility in charge

name		[___|___/___|___|___]
Supervisor's name		[___|___/___|___|___]

INSTRUCTIONS TO DATA COLLECTOR

This assessment should be completed by observing the infrastructure of the facilities that are available and through discussions with the in charge of facility or heads of departments such as MCH, Maternity and Outpatient department, in patient, pharmacy or health records on the day of the visit. IN ALL CASES, you should verify that items exist and are functional by observing them yourself. If you are not able to observe, then code accordingly. For each item, circle the response or describe as appropriate

NO.	Question		Enter value
V100	**Actual respondent** ***(Indicate title of the respondent)***		
V101ai	What is the catchment population of this facility (that is how many people is this facility supposed to serve)?		
V101aii	Expected number of pregnant women in the year		
V102a	Bed capacity of health facility:	**Actual**	
		Current /observed	
		Avarage number in last quarter	
V102b	Number of postnatal consultation rooms	**Stand alone**	
		Shared	
	Does the facility have any of	**Yes=1**	**No=2**

V102 d	**the following:** ***Circle yes=1 OR No= 2***		
	a) Number of functional delivery couches	**Write number _____**	
	b) Functional Newborn unit/space/area (for children 0-28 days)	1	**2**
	c) Capacity of new born unit ***(enter the number of newbornsthe unit it can accommodate/ what is current)***	Actual _____	**Observed ----------**
	d) Functional maternity unit ***(combining antenatal, labour, postnatal and newborn services in smaller health facilities)***	1	**2**
	e) Functional delivery room ***(meets basic stardands for delivery)***	1	**2**
	f) Functional operating theatre ***(meets basic***	1	**2**

	stardands)		
	g) Functional postnatal ward ***(with post natal beds and meets basic stardands)***	1	**2**
	h) Functional kangaroo mother care beds ***(in postnatal ward)***	1	**2**
	i) Functional nursery space	1	**2**
	j) Functional paediatric unit ***(for all children including newborns that meets basic stardands)***	1	**2**
	k) Newborn resuscitation space/table	1	**2**
	l) Functional blood bank/storage	1	**2**
	m) Functional Laboratory ***(meets basic stardands)***	1	**2**
	n) Customer care	1	**2**

	desk/reception desk				
V102e	What is the source of power for this facility? **(Circle all that apply)**	**Options**		**Code**	**SKIP**
		Electricity		1	
		Solar power		2	
		Generator		3	
		LPG/Gas		4	
		None		5	**>>V102m**
		Other specify		88	
V102f	**Circle Yes=1, No=2 & N/A=98**				
	Does the facility have electricity 24/7 (24 hours per day)	1	2	98	
V102g	[Where applicable] Does the Newborn unit/space/area have electricity 24/7 (24 hours per day)?	1	2	98	
V102h	Is there an operating theatre that is served with electricity 24/7 (24 hours per day)?	1	2	98	
V102	[Where applicable] Does the	1	2	98	

i	postnatal ward have electricity 24/7 (24 hours per day)?				
V102 j	Does this facility have back up power system?	Yes		1	
		No		0	>> **V102m**
V102 k	If yes what is the source of the back up power sytem? *(Please tick only the main one)*	Solar power		1	
		Generator		2	
		Gas/LPG		3	
		Kerosene		4	
		Other specify		88	
V102 l	Is the back power system readily available and functional when needed?	Always		1	
		Most of the time		2	
		Sometimes		3	
		Never		4	
V102 m	What is the **MAIN** source of water used in the facility? (Circle one (1) main source)	Piped water		1	
		Rain water harvesting		2	
		Bore holes		3	

			Water bowsers	4
			Spring	5
			Surface water- river, dams	6
			Others specify	88
V102n	How frequent does the facility have water interruptions		1-3 times a week	1
			1-3 times a month	2
			Always	3
			Never	4
			Don't know	98
	Circle 1 for YES or 2 for NO		**Yes=1**	**No=2**
V102o	Does the facility have a service charter mounted in locations that are visible to clients		1	2
V102p	Does the facility have clear signage for the following	1. Wards	1	2
		2. ANC	1	2
		3. FP	1	2
		4. Immunization	1	2

	units;	5. Delivery	1			2		
		6. PNC directions service areas	1			2		
V102q	Does the facility have Sign posts and Signage present indicating location of facility		1			2		
V102r	Does the faiclity have adequate space designated space for infant care		1			2		
V103a	Observe the status of the following in the listed units **(INDICATE 1 for YES or 2 for NO)**		Labour ward	Delivery room	maternity	Postnatal ward	unit/space	Paediatric ward
		a) Floor with no damages						
		b) Doors are functional/lockable						
		c) Windows /window panes not broken						

		d) Ceiling boards /roofs not leaking or worn out)						
		e) Walls painted, without cracks						
		f) Functioning hand washing sinks						
V103 b	Observe the cleanliness of the following areas **(INDICATE 1 for YES or 2 for NO)**	Floors clean with no obvious dirt						
		Counter tables, chairs clean with no obvious dirt						
		Walls are clean						

	In all cases below Enumerator to observe: **Circle Yes=1, No=2**		**OPD**		**MCH-FP**			
V104 a	Is there a waiting area shaded and with seats?		1	2	1	2		
V104 b	Is there privacy for ANC/PNC examination?		1	2	1	2		
V104 c	Is there a standard operating procedure for managing emergency care for infants? (Look out for, immediate care, pre-referral management guidelines flowchart or Job Aids or Posters explaining procedures for managing emergency care among infants)		1	2	1	2		
V104 d	Are there toilets in the following areas		1	2	1	2		

V207f	The last time a referral was received in this facility from a CHV, was feedback given to the CHV (*Ask for evidence of the feedback)*	Yes= Evidence available Yes = Evidence not available	No=2

	SECTION II: REFERRAL AND ADMITTANCE **Preferred respondent; Facility-in-charge/Maternity-in-charge**		
V200	Actual respondent		
V201a	In the last 24 hours were there any occasions where a caregiver who brought an infant for treatment of any kind was turned away, for any reason?	Yes=1	No=2
V201b	If Yes, what were the reason/s (*Circle all that apply)*	Inadequate bed capacity	1
		Lack of technical expertise or skilled staff to manage condition	2
		Lack of equipment to manage condition	3
		Inadequate supplies to manage presenting condition	4
		Staff burn out	5
		Security reasons	6

Section 3: SUPPORT SUPERVISION & QUALITY IMPROVEMENT Preferred respondent: Facility-in-charge			
V300	**Actual respondent**		
	Quality Improvement	**Yes=1**	**No=2**
V301a	Is there a Quality Improvement team (QIT) in place?	1	2
V302b	Is there a QIT with clear terms of reference?	1	2
V303a	Is there anyone in the facility/QIT team member(s) using any of the following guidelines: **Circle Yes=1, No=2**	**Yes=1**	**No=2**
	a) Kenya Quality Model for health	1	2
	b) Client oriented provider efficient sevices (COPE) for MNH	1	2
	c) Stardand based management and recognition (SBMR) for MNH	1	2
	d) Safe care for MNH	1	2
	e) Health reforms, leadership and governance courses	1	2
V304a	Number of times QIT met in the last quarter (**enter values**)		
V304b	Number of times QIT met in the last year (**enter values**) (GOK year)		

V305a	Does the facility have a quality improvement plan in place	1	2
V305b	Have staff participated in a quality improvement CME in the last six months related to newborn care	1	2
V305c	Have staff participated in a QI learning session in the last year	1	2
V305d	Has the facility managed to document best practices by the QIT	1	2
V305e	Does the facility have a system for managing patient/customer complaints and feedback?	1	2
V305f	Does the facility have a suggestion box for collecting views and feedback	1	2
	Support supervision **Circle Yes=1, No=2**	**Yes=1**	**No=2**
V306a	a) Did supportive supervision take place in this facility in the last quarter for MNH/RH services?	1	2
	i) Maternal health services	1	2
	ii) New born/child health services	1	2
V306b	Does the support supervision team use any checklist during supervision visits	1	2
V306c	Did the support supervision team provide feedback to this	1	2

	facility after the last support supervision visit (any evidence?)		
V306d	Do you or anyone in this facility supervise CHVs?	1	2
V306e	If yes, was the CHVs supervision conducted in the last quarter?	1	2

SECTION 4: INFECTION PREVENTION PRECAUTIONS **Preferred Respondent: FACILITY IN CHARGE**				
		In all cases below Enumerator to observe: **Insert Yes=1, No=2 98=Not applicable (N/A) for each of the following areas**		
V400	**Actual Respondent**			
V401: Does this facility have the		**Newborn unit/space/area**	**OPD**	**MCH**

following: ***(Please check for each unit and*** **Indicate Yes=1, No=2, 98=Not applicable*)**	**Yes =1**	**No= 2**	**98= N/A**	**Yes =1**	**No= 2**	**98=N/ A**	**Yes =1**	**No= 2**	**98 = N/ A**
a. A dedicated area for instrument cleaning									
b. Detergent **OR** soap for washing equipment									
c. Chlorine tablets **OR** liquid bleach **OR** bleaching powder/ OR enzymatic cleaning agent									

d. Wash basin **OR** bucket									
e. Non-expired 0.5% chlorine solution or other chemical disinfectant? (*NOTE: Label and date required; expiration after 30 days) Check from supply*									
f. Clean towels **OR** drying linens									
g. Single use hand drying towels or a functioning									

electric hand dryer									
h. A functional autoclave									
i. A functional electric oven that can reach 170C									
j. A functional electric dry heat sterilizer OR boiler OR steamer									
k. A pot OR boiler used for boiling water to clean instruments									
l. If facility uses boiled water, is									

there sufficient fuel to boil instruments for 20 minutes?									
m. Chetal forceps for removing/picking sterile equipment?									
n. Infection prevention equipment (color coded bins with biodegradable liners, safety boxes)									
V402: Does the facility have the following: ***(PLEASE CHECK FOR EACH UNIT) and*** **Indicate Yes=1, No=2, 98=Not applicable*)***									

	Newborn unit/space/area			OPD			MCH		
	Yes =1	**No= 2**	**98=N/A**	**Yes =1**	**No= 2**	**98=N/A**	**Yes =1**	**No= 2**	**98 = N/A**
a. Sterile, single-use disposable syringes with needles **OR** disposable syringes without needle									
b. Puncture-proof sharps disposal containers									
c. Waste receptacle with lid and									

plastic liner									
d. Waste receptacle **without** lid and plastic liner bag									
e. A sharps disposal container that is overflowing or torn/pierced									
f. Leak-proof, lidded plastic container for medical waste									
g. Access to functional incinerator **OR** accessible									

pit disposal system that is fenced									
h. Separate disposal containers for medical and general waste									

V403: Does the facility have the following characteristics *(PLEASE CHECK FOR EACH UNIT)* Indicate Yes=1, No=2, 98=Not applicable*)*

Features	**Newborn unit/space/area**			**OPD**			**MCH**		
	Yes =1	**No= 2**	**N/A= 98**	**Yes =1**	**No= 2**	**N/A =98**	**Yes =1**	**No= 2**	**N/A = 98**
a. Are there exposed or unattended sharps or needles?									

b. Is floor swept, with no obvious dirt or waste?									
c. Are counters/tables/chairs all wiped clean, with no obvious dust or waste									
d. Are there any used needles or sharps outside of the sharps box									
e. Clean electric oven or autoclave									
f. Are there any									

bandages or infectious waste lying uncovered?									
g. Do sterilized instruments have date of sterilization?									
h. Are insides of cupboards or cabinets clean?									
i. Does the ceiling have any water stains or significant damage?									
j. Are cleaning equipment, disinfectants readily accessible									

k. Have cleaning equipment, disinfectants been used in the last procedure?									
l. Hand washing area in every room with clean water, liquid soap and wipes like serviettes etc.									
m. Is there a sink/hand washing point with a tap and running water?									

n. Is there soap /alcohol rub for hand washing?										

SECTION 5: MNH HUMAN RESOURCES

Please, give an overview of the personnel in your health facility. Although we mainly focus on MNH areas, information about the whole facility can give a complete impression on staffing levels

PREFERRED RESPONDENT: FACILITY IN CHARGE

V500	**Actual Respondent**
V501	**Ask how many are assigned to work in each unit and those are available today (read the list)**

ASK how many providers are in the facility: **And indicate #**		**Total in the Facility**		**# in MCH Unit**		**New born unit /NBU**		**Paediatric ward/Area**		**# in OPD**	
	Actual=A, Available	**A**	**AT**	**A**	**AT**	**A**	**AT**	**A**	**AT**	**A**	**AT**
a)	Specialised medical										
b)	Medical officers										
c)	Clinical officers										
d)	Registered										
e)	Enrolled nurse										

f)	Anesthetist										
g)	Theater nurses										
h)	Laboratory										
i)	Pharmacists &/or										
j)	Nutritionists										
k)	Associated medical										
l)	Lay counsellors e.g. M2M, VCT, Expert										
m)	Health information										
n)	Administrators										
o)	Student nurses										
p)	BscN Interns										
q)	Medical Interns										
r)	Clinical Officer Interns										
s)	Subordinate staff										
t)	Social worker										
u)	Other (specify)										

V50	**Training of staff in Newborn management**				
	Has any of the staff in the following units received on-the-job/in-service/CME	**MCH**		**Newborn**	
		Residential training	Mentorship/OJT	Residential training	Mentorship /OJT
a)	Integrated management of				
b)	Essential newborn care (Basic care of				
c)	Continuous positive airway pressure				
d)	Helping babies				

e)	New born care for primary health care				
f)	Management of preterm or small				
g)	Kangaroo mother				
h)	Breast feeding/lactation/ne				
i)	Post-natal care for				
j)	Emergency Triage				
k)	Others (specify)				

SECTION 6: New born services provided			
V601	Are these (read all) new-born care services usually (in *the last quarter)* available to clients at this facility? **[FOR EACH SERVICE, ENTER 1**	**Available at MCH/OPD unit (enter as appropriate)**	**Available In new-born unit**
a)	Ensuring clean delivery		
b)	Prevention of infections for mother		
c)	Provision of warmth		
d)	Newborn resuscitation		
e)	Infant feeding (e.g. early initiation of feeds, exclusive breastfeeding)		
f)	Cord care- e.g. use of chlorohexidine		
g)	Provision of Vitamin K		

h)	Provision of tetracycline ointment		
i)	Performing comprehensive		
j)	Blood typing services		
k)	HIV/AIDS testing services (Rapid test and Dry blood spot)		
l)	Offer immunization services.		
m)	Postnatal care for mother check-up		
n)	Postnatal care for the baby		
o)	Growth monitoring		
p)	Continuing health education and		
q)	Others (Specify)		

SECTION 7 DRUGS, EQUIPMENT, & SUPPLIES

ASK to see the stocks of the following commodities (supplies or equipment) currently available for use for new-born or OPD section, maternity and are unexpired **[FOR EACH ITEM, ENTER 1 FOR YES' 2 FOR 'NO' AS APPROPRIATE]**

V701Test kits	**Currently in stock?**	**Any stock-out in last 3 months**	**Currently in stock beyond the**
ABO & RH grouping kits			
Blood sugar kit			
Dry blood spot (DBS)			
HIV rapid test kits			
Cross match kits			
Testing for Bilirubin			
Urinalysis kit			
VDRL test kits			
Haemoglobin estimation			
V702: Non- pharmaceuticals			

	Blades-surgical size 23			
	Cotton wool absorbent 400			
	Sterile gauze plain 36''			
	Crepe bandage			
	IV giving sets			
	Volume sets(Baby blood			
	Solusets (Baby IV sets)			
	Gloves- surgical latex			
	IV cannulas			
	Safety boxes			
	Syringe disposable 1cc, 2cc, 5cc, 10cc with needle 21 G			
	Zinc Oxide strapping 7.5			
	Measuring tape			
	Cup and spoon			
	Sterile water			
	Needles 21, 23			
	Sterile cord clamps			
V703: Immunization				
	Tetanus Toxoid			
	BCG			
	Measles			
	Polio (oral /IPV)			
	Hepatitis B			
	DPT/ Pentavalent			
	Pneumococcal vaccine			
	Rotavirus			
V705 Pharmaceuticals				
	Amoxycillin 250MG/5ML			
	Amoxycillin Caps 250 mg			
	Ampicillin 125MG/5ML			
	Antenatal corticosteroids			
	Artemisinin-based			
	Benzathine Penicillin			
	Benzyl Penicillin			
	Calcium gluconate			
	Calium phosphate			
	Ceftriaxone			

	Chlorhexidine digluconate			
	Chlorpheniramine tablets			
	Clotrimazole cream 1%			
	Crystalline Penicillin			
	Dextrose 10% infusion			
	Epinephrine 1 mg/ml (as HCL or hydrogen tartrate)			
	Ergometrine injection			
	Ethanol 70% (denatured			
	Flucloxacillin			
	Glucose Injectable solution			
	Gentamicin			
	Hydrocortisone injection			
	Injectable Magnesium			
	Iron			
	Metronidazole suspension			
	Mifepristone + misoprostol			
	Misoprostol tablets 200mcg			
	Multivitamins			
	Normal saline			
	Oral rehydration solution			
	Oxytocin injection 10/ml			
	Paracetamol			
	Phenobarbital			
	Retinol (Vit A)			
	Ringers lactate			
	Sodium hypochlorite 4-6%			
	Tetracycline eye ointment			
	Vitamin D			
	Vitamin K			
	Water for injection 10 ml			
	Zinc Sulphate tablets			

V706: new-born Equipment [FOR EACH ITEM, ENTER 1 FOR YES' 2	**Newborn unit/space/area**	**MCH/OPD**	**Number available**
a) Baby cots			
b) Clinical Thermometer -low reading			
c) Drip stand			
d) Examination couch			

e) Fridge for vaccines			
f) Functional blood pressure machine			
g) Functional Digital weighing scale to			
h) Functional paediatric blood pressure			
i) Length board			
j) Measuring cups			
k) Paediatric Stethoscope			
l) Procedure trolley			
m) Pulse oximeter with newborn probes			
n) Radiant heater			
o) Resuscitation table			
p) Spotlight or flashlight or examination			
V707 Neonatal Resuscitation Equipment			
a) A firm stable surface			
b) Airways sizes 000,00, 0			
c) Ambu bag			
d) At least two pieces of dry warm			
e) Endotracheal tube size 2.0, 2.5, 3.0,			
f) Exchange transfusion set			
g) Face mask sizes 0, 1, 2			
h) Intraosseous needle 18			
i) Laryngoscope blades size 0 ,1			
j) Laryngoscope with extra batteries			
k) Mucous extractor			
l) Functional baby incubators			
m) Nasal prongs			
n) Nasogastric tube size F4, F6 , F8			
o) Normal saline infusion			
p) Paediatric solusets/microdrippers			
q) Ringers lactate infusion			
r) Scissors			
s) Marking tape			
t) Resuscitaire or source of heat			
u) Suction equipment			
v) Wall clock			
w) Working phototherapy equipment			

Section 8: SUPPLY CHAIN MANAGEMENT **Potential respondent: In charges/pharmacist**				
V800	Actual respondent			
V801a	Where do you **MAINLY** obtain your pharmaceuticals and non/pharmaceutical supplies	**Source**	**non-pharmaceutical commodities**	**Pharmaceutical commodities**
		KEMSA	1	1
		MEDS	2	2
		County Warehouse	3	3
		Sub County Warehouse	4	4
		Private wholesalers	5	5
		Private Pharmacies	6	6
		Donations	7	7
		Prepared in-house	8	8
		NGOs	9	9
		Other *(specify)*	88	88
V801b	**Are all stocked medicines in store with……?**		**Yes=1**	**No=2**

	(a) Adequate storage space so that staff can place and remove it easily and quickly to see how much remains		
	(b) Adequate security (i.e. strong and lockable doors, windows, cupboards; burglar bars on windows and hatches with controlled access to the stores)		
	(c) Easy access to the drug store (i.e. close to pharmacy/dispensary, entrance and internal space not blocked) but controlled (i.e. only authorized persons)		
	(d) Separate from dispensing area if possible (i.e. either separate locked room or partitioned area of dispensary)		
	(e) Roof and windows that don't leak (i.e. no risk of rain damage)		
	(f) Well lit (i.e. easy to see around the store and locate stock)		
	(g) Floor that is clean and smooth (e.g. cemented) to facilitate cleaning		

	(h) Walls smooth and easily cleaned		
	(i) Store is clean (i.e. free of dust, cobwebs, rubbish)		
	(j) Well ventilated stores (i.e. should be good possibility of cross-ventilation)		
	(k) Temperature & humidity controlled where possible (e.g. air-conditioned)		
	(l) Interior shaded from direct sunlight (e.g. curtains on windows) to protect against damage to heat-sensitive and light-sensitive items (No direct sunlight should enter the area, glass window panes painted white, or with curtains/blinds to protect against sunrays)		
	m) Shelving/pallets/cupboards adequate, suitable and good quality		
	(n) EMMS (Essential Medicine and Medical Supplies) that require cold storage are stored and monitored in accordance with good cold chain practices		

	(o) Fire safety equipment available (i.e. appropriate fire extinguisher or sand buckets) and staff trained in correct use			
	(p) Separate fire-proof outdoor premises available for large quantities of flammable items (e.g. methylated spirits, kerosene) and are located at least 20m from other buildings			98
	(q) A register for controlled medicines and substances is maintained and is up to date			
	(r) Systematic stock arrangement helps stock access and stock control			
	(s) Drugs stored first expire first on the shelf, i.e. the first expiry first out (FEFO) approach			
	(t) Liquids are stored on lower shelves or at the bottom of stacked cartons			
	(u) Bulky items (e.g., IV fluids, dressings) only a few are on the shelf and the rest are kept together in a bulk storage area			

	(v) No EMMS are placed directly on the floor		
	(w) Pallets are available to hold bulky items		
	(x) Basic material handling equipment (such as pallet lift)		
	(y) Cartons are stacked at least 10cm above floor level, 30cm from walls/other stacks and are under 2.5m high		
	(z) Cartons are stored with arrows pointing up and label (ID, expiry date) clearly visible		
	aa) Damaged, deteriorated or expired items are promptly separated from usable stock		
	bb) There is a stock record system		

	cc) Every item has its own Stock Control Card (SCC). (Note**:** each different dose-form, presentation or strength is treated as a different item and *has its own SCC*, for example: - amoxicillin capsules 250mg and amoxicillin capsules 500mg)		
	dd) A daily dispensing record book is maintained		
	ee) A physical inventory count is conducted at least every three months and stock records updated		
V802	Does the facility have a functional EPI refrigerator		
V803	Does the facility have stable electricity (has not had an outage for more than 2 hours in the past week)		
V804	Does the facility have a functional Medicines and Therapeutics Committee as per the Kenya National Pharmaceutical Policy Guidelines?		

SECTION 9: HEALTH MANAGEMENT INFORMATION SYSTEM (HMIS) **Potential respondent: Hospital: Hospital HRIO; Health Centre: HRIO/ Facility In-charge; Clinics/Dispensaries: Facility In-charge or designated person**				
No.	**Questions**		**Yes=1**	**No=2**
V900	**Actual respondent**			
V901a	Did you receive any of the following HMIS tools (registers/reporting and referral forms) from county level in the last six months?			
	I. Birth register			
	II. Clinical case management			
	III. Discharge forms			
	IV. Inpatient register			
	V. Maternal perinatal death surveillance and response forms			
	VI. Newborn admission record			
	VII. Newborn register			
	VIII. Newborn assessment form			
V901b	If yes, did you receive enough to cover all HMIS needs for the whole of the last six months?			
V901c	Did you ever photocopy/print any HMIS tools in the last six months to ensure there were enough?			
V901d	Have you ever run out of	**Category**	**Yes=1**	**No=2**

	the following HMIS tools in the last six months?	I. MOH 204 Outpatient (under 5)		
		II. MOH 333 maternity register		
		III. MOH 373 for Newborn		
		IV. Summary for the newborn care		
		V. MOH 405 (ANC register)		
		VI. MOH 406 (PNC Register)		
		VII. MOH 513 (CHV Household register for line listing)		
		VIII. MOH 514 (CHV DAR)		
		IX. MOH 515 (CHEW Monthly summary)		
		X. MOH 516 (Community chalkboard)		

		XI. MOH 711 (Integrated)		
		XII. MOH 713 (Nutrition monthly summary)		
		XIII. MOH 717 (Facility Work load)		
		XIV. MOH 701A (OPD (under 5)Summary/ tally sheet)		
		XV. MOH 710 (Immunization summary)		
		XVI. MOH 705A (OPD (under 5) summary)		
		XVII. MOH 510 (Immunization permanent register)		
		VIII. Maternal death summary form		
		XIX. Perinatal death summary		
		XX. MOH 702		

		(Immunization tally sheet)		
		XXI. Others specify		

V902	Have you had any of the following problems with HMIS tools in the last three months?	**Yes=1**	**No=2**
	Poor quality ink/unreadable		
	Pages in the wrong order/upside down		
	Missing pages		
	Others (specify)		
V903	Have you received any feedback from the sub-county level on HMIS data quality in the last quarter?	**Yes=1**	**No=2**

V904	How well do you understand the HMIS compilation and reporting process?	**Very well**	**Fairly well**	**Not very well**	**Not at all**
	Filling in registers	1	2	3	4
	Compiling reports	1	2	3	4
	Submitting reports	1	2	3	4
	Feedback received	1	2	3	4

V905	Do any staff (tier 2-subcounty) /team of staff (tier 3 and above-county and tertiary) at this facility review the	**Yes=1**	**No=2**

	HMIS data at least once a quarter?			
V906	Did you use HMIS data for any of the following in the last financial year?			
	i) Management of drugs and supplies			
	ii) Drug forecasting			
	iii) Facility targets setting			
	iv) Management of equipment and supplies			
	v) Management of human resources			
	vi) Funds re-allocation			
	vii) Service quality monitoring			
	viii) Annual work plan			
	ix) Selection of suitable location for outreach			
	x) Increase coverage of services			
	xi) To identify unreached population and increase service coverage			
	xii) To inform stakeholders			
	Others (Specify)_____			
V907	Has the facility submitted the last	**Categories**	**YES=1**	**No=2**

	three HMIS monthly summary sheets in time (before 5th)?	I. MOH 333 (Maternity register)		
		II. MOH 405 (ANC register)		
		III. MOH 513-516 (CHV tools)		
		IV. MOH 711 (Integrated)		
		V. MOH 713 (Nutrition monthly summary form)		
		VI. MOH 717 (Work load)		
		VII. Maternal death summary form		
		VIII. MOH 406 PNC Register		
		IX. Newborn register		
		X. Perinatal death summary form		

V908	How complete are the last three monthly HMIS summary sheets (MOH 711)? (verify from actual facility reports)	All complete/no gaps	1	
		A few gaps	2	
		A lot of gaps	3	
		Not filled any	4	
V909	Does the facility submit maternal/newborn health data electronically or via paper?	Electronically	1	
		Paper-based	2	
		Both electronically and paper-based	3	
V910	In regard to the HMIS standard operating procedure and guidelines, do you have a copy at the facility?	**Yes=1**	**No=2**	
V911	What do you think could be done to improve the HMIS recording, reporting process and data use?	Avail HMIS tools adequately		1
		Mentorship/coaching and support supervision		2
		Regular data feedback from sub county/county level		3
		Hold regular facility data review meetings		4
		Orientation on data interpretation and presentation skills		5
		Orientation of guidelines and SOP		6

		for HMIS		
		Others specify		88
V912	Has your facility been supervised on data quality by sub-county HMT in the last six months?	Yes		1
		No		2
V913	If YES, how many times were you supervised?	One time		1
		Two times		2
		Three times		3
		Four Times		4
		None		99
V914	Has any staff received onsite HMIS mentorship on MNH in the last six months?	**Maternal**	Yes	1
		Newborn	No	2
V915a	Has the facility conducted Routine Data Quality Assessment (RDQA) in the last six months?	Yes		1
		No		2
V915b	If YES, how many times was the	One time		1

	assessment done?	Two times	2
		Three times	3
		Four Times	4
		None	99
V916a	Has the facility, attended data review forums at the sub-county in the last six months?	Yes	1
		No	2
V916b	If no, what is the reason for not holding a data review forum last six months? (check all that apply)	There is no functional data quality improvement team in place at sub-county	1
		Data review forums are not planned for	2
		Data forums are held, but not able to attend due to high workload	3
		Other (specify)	88
SECTION 10: PAYMENT/FEES **Preferred respondent: Facility-in-charge**			

1000.	**Actual respondent:**		
V1001: For each of the following items, indicate if there is routine fee and if yes, the amount		**Enter 1 for YES 2 for NO**	**Amount in KSH (If yes)**
I.	ANC profile		
II.	Normal delivery		
III.	Assisted vaginal delivery		
IV.	Postnatal care		
V.	Neonatal care		
VI.	Syphilis testing		
VII.	Others STI Testing		
VIII.	HIV Testing		
IX.	In case a client is not able to pay for the hospital bill, is there a waiver system?		N/A

SECTION 11: IEC MATERIALS **Preferred Respondent; MCH-in-charge**		
1100. Actual Respondent		
V1101: Are any of the following visual aids easily visible to clients? **[FOR EACH ITEM, ENTER 1 FOR 'YES', 2 FOR 'NO' AS APPROPRIATE]**	**Maternity UNIT**	**MCH-FP**
a) Posters on danger signs for the baby		
b) Posters about breastfeeding		
c) Posters on Kangaroo mother care		
d) Posters about immunization		
e) Posters on care of small newborns		
f) Posters on HIV prevention (PMTCT)		
g) Posters on cord care		
h) Posters on personal hygiene of mother and newborn		

V1102: Are any of the following types of information booklets or pamphlets freely available in the consultation rooms for clients to take home?		
a) Mother baby booklet		
b) Danger signs for postnatal mother and newborn		
c) Infant feeding (exclusive breastfeeding)		
d) Kangaroo mother care		
e) Immunization		
f) Care of small newborns and post-natal care for mother		
g) HIV prevention (PMTCT)		
h) Cord care for the newborn		
i) Personal hygiene of mother and newborn		
V1103: Are any of the following protocols for delivery of services available in the consultation/counselling rooms?		
a) New-born resuscitation		
b) Care of the sick new-born		
c) Kangaroo mother care		

d) Possible serious bacterial infections (PSBI)			
e) Basic Paediatric Protocols			
f) Newborn care handbook			
g) Helping babies breathe			
h) CPAP (Continuous positive airway pressure)			
i) PMTCT guidelines/eMTCT			
j) Guideline/protocol on HIV testing procedures in this facility?			
k) Essential obstetrics care (EOC) guidelines			
l) Standards for maternity care			
m) Postnatal care guidelines/reference materials			
n) Guidelines/ protocol on Infection prevention/universal precautions			
o) MPDSR Guidelines			
p) Kenya Quality Assurance Model for Health Standards and Checklist			
National Essential Medicines List			
V1104	**Does the facility have any of the following?**	**Yes=1**	**No=2**

V1104a	Peer and support groups for pregnant women		
	Peer and support groups for post-natal women/kangaroo care		
V1104b	Facility linkage to community care and support services		
V1104c	Existence of M&E tools for documenting and tracking referrals from facility to community		
V1104d	Availability of client tracking system (defaulter management tools and job aids)		

Recommendations
What are the current quality improvement initiatives for newborn care within the facility
What do you consider to be the FIVE most pressing QoC improvements for newborn care required

1.	
2.	
3.	
4.	

Comments

Thank you.

Appendix XI: Status of various service areas

	County Referral Hospital		**Sub-county hospital**		**Health center**		**Dispensary**		**Clinic (private/faith based)**		**Nursing home**		**Total**	
	3	**%**	7	**%**	15	**%**	12	**%**	1	**%**	1	**%**	39	**%**
Floor with no damages (Labor ward)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	1	100.0	30	76.9
Floor with no damages (Delivery room)	3	100.0	7	100.0	13	86.7	12	100.0	1	100.0	1	100.0	37	94.9
Floor with no damages (maternity)	3	100.0	7	100.0	12	80.0	7	58.3	1	100.0	1	100.0	31	79.5
Floor with no damages (Postnatal ward)	3	100.0	6	85.7	10	66.7	5	41.7	0	0.0	1	100.0	25	64.1
Floor with no damages (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Floor with no damages (Pediatric ward)	2	66.7	5	71.4	3	20.0	1	8.3	1	100.0	0	0.0	12	30.8
Doors are functional/lockable (Labor ward)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	1	100.0	30	76.9
Doors are functional/lockable (Delivery room)	3	100.0	6	85.7	13	86.7	12	100.0	1	100.0	1	100.0	36	92.3

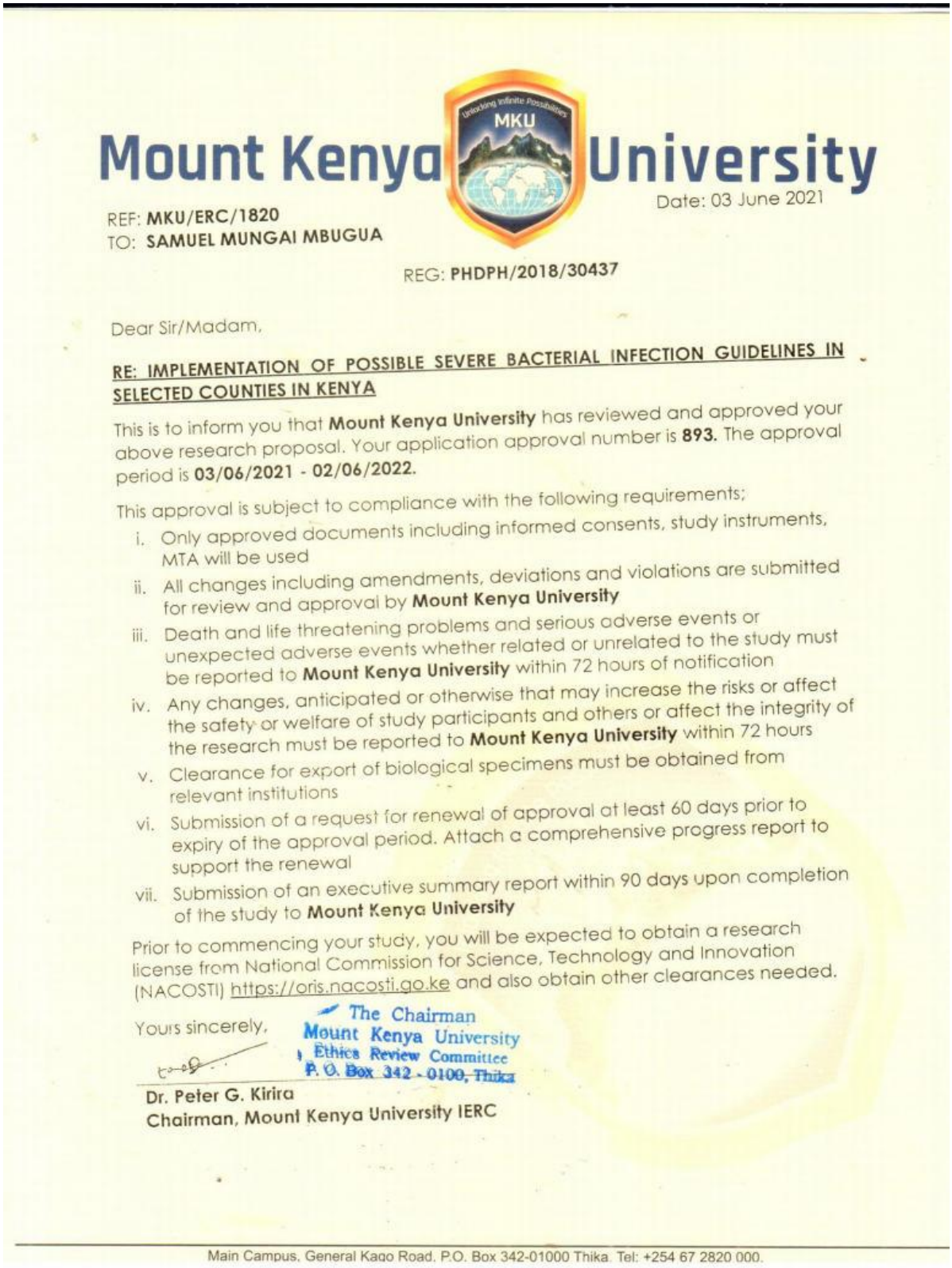
Doors are functional/lockable (maternity)	3	100.0	7	100.0	12	80.0	7	58.3	1	100.0	1	100.0	31	79.5
Doors are functional/lockable (Postnatal ward)	3	100.0	6	85.7	11	73.3	6	50.0	0	0.0	1	100.0	27	69.2
Doors are functional/lockable (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Doors are functional/lockable (Pediatric ward)	3	100.0	5	71.4	4	26.7	1	8.3	1	100.0	0	0.0	14	35.9
Windows /window panes not broken (Labor ward)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	0	0.0	29	74.4
Windows /window panes not broken (Delivery room)	3	100.0	6	85.7	13	86.7	10	83.3	1	100.0	0	0.0	33	84.6
Windows /window panes not broken (maternity)	3	100.0	6	85.7	12	80.0	7	58.3	1	100.0	0	0.0	29	74.4
Windows /window panes not broken (Postnatal ward)	3	100.0	6	85.7	11	73.3	5	41.7	0	0.0	0	0.0	25	64.1
Windows /window panes not broken (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Windows /window panes not broken (Pediatric ward)	3	100.0	5	71.4	4	26.7	1	8.3	1	100.0	0	0.0	14	35.9
Ceiling boards /roofs not leaking or worn out (Labor ward)	3	100.0	5	71.4	8	53.3	6	50.0	1	100.0	0	0.0	23	59.0

Ceiling boards /roofs not leaking or worn out (Delivery room)	3	100.0	6	85.7	9	60.0	8	66.7	1	100.0	0	0.0	27	69.2
Ceiling boards /roofs not leaking or worn out (maternity)	3	100.0	6	85.7	8	53.3	6	50.0	1	100.0	0	0.0	24	61.5
Ceiling boards /roofs not leaking or worn out (Postnatal ward)	3	100.0	5	71.4	8	53.3	4	33.3	0	0.0	0	0.0	20	51.3
Ceiling boards /roofs not leaking or worn out (newborn unit/space)	3	100.0	2	28.6	1	6.7	1	8.3	1	100.0	0	0.0	8	20.5
Ceiling boards /roofs not leaking or worn out (Pediatric ward)	3	100.0	4	57.1	3	20.0	1	8.3	1	100.0	0	0.0	12	30.8
Walls painted, without cracks (Labor ward)	3	100.0	6	85.7	13	86.7	7	58.3	1	100.0	0	0.0	30	76.9
Walls painted, without cracks (Delivery room)	3	100.0	7	100.0	14	93.3	11	91.7	1	100.0	0	0.0	36	92.3
Walls painted, without cracks (maternity)	3	100.0	7	100.0	13	86.7	7	58.3	1	100.0	0	0.0	31	79.5
Walls painted, without cracks (Postnatal ward)	3	100.0	6	85.7	12	80.0	6	50.0	0	0.0	0	0.0	27	69.2
Walls painted, without cracks (newborn unit/space)	3	100.0	3	42.9	2	13.3	1	8.3	1	100.0	0	0.0	10	25.6
Walls painted, without cracks (Pediatric ward)	3	100.0	5	71.4	3	20.0	1	8.3	1	100.0	0	0.0	13	33.3
Functioning hand washing	3	100.0	6	85.7	9	60.0	3	25.0	1	(00.0	1	100.0	23	59.0

sinks (Labor ward)														
Functioning hand washing sinks (Delivery room)	3	100.0	7	100.0	9	60.0	7	58.3	1	100.0	1	100.0	28	71.8
Functioning hand washing sinks (maternity)	3	100.0	6	85.7	9	60.0	4	33.3	1	100.0	1	100.0	24	61.5
Functioning hand washing sinks (Postnatal ward)	3	100.0	6	85.7	8	53.3	3	25.0	0	0.0	1	100.0	21	53.8
Functioning hand washing sinks (newborn unit/space)	3	100.0	3	42.9	1	6.7	0	0.0	1	100.0	0	0.0	8	20.5
Hand washing sinks (Pediatric ward)	3	100.0	5	71.4	1	6.7	0	0.0	1	100.0	0	0.0	10	25.6

Source Field Data(2021)

Appendix XII: Ethical Review Committee letter



Mount Kenya University

Date: 03 June 2021

REF: **MKU/ERC/1820**
TO: **SAMUEL MUNGAI MBUGUA**

REG: **PHDPH/2018/30437**

Dear Sir/Madam,

RE: IMPLEMENTATION OF POSSIBLE SEVERE BACTERIAL INFECTION GUIDELINES IN SELECTED COUNTIES IN KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **893.** The approval period is **03/06/2021 - 02/06/2022.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

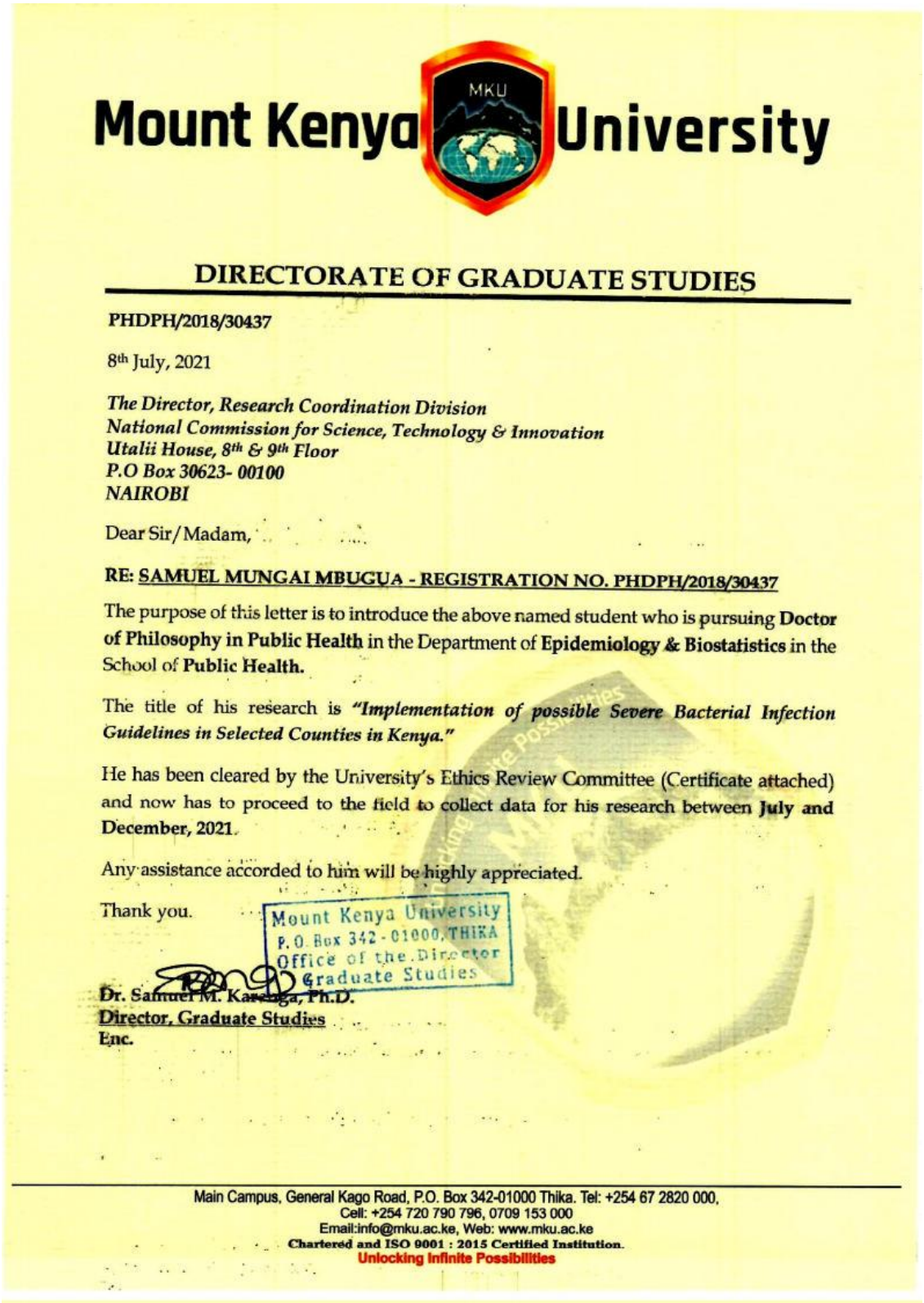
Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Peter G. Kirira
Chairman, Mount Kenya University IERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000.

APPENDIX XIII: Introductory Letter



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

PHDPH/2018/30437

8th July, 2021

The Director, Research Coordination Division
National Commission for Science, Technology & Innovation
Utalii House, 8th & 9th Floor
P.O Box 30623- 00100
NAIROBI

Dear Sir/Madam,

RE: SAMUEL MUNGAI MBUGUA - REGISTRATION NO. PHDPH/2018/30437

The purpose of this letter is to introduce the above named student who is pursuing **Doctor of Philosophy in Public Health** in the Department of **Epidemiology & Biostatistics** in the School of **Public Health.**

The title of his research is ***"Implementation of possible Severe Bacterial Infection Guidelines in Selected Counties in Kenya."***

He has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data for his research between **July and December, 2021.**

Any assistance accorded to him will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Kariuki, Ph.D.
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel: +254 67 2820 000,
Cell: +254 720 790 796, 0709 153 000
Email:info@mku.ac.ke, Web: www.mku.ac.ke
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Appendix XIV: NACOSTI Letter

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 939309

Date of Issue: 21/July/2021

RESEARCH LICENSE

This is to Certify that Mr., SAMUEL MBUGUA of Mount Kenya University, has been licensed to conduct research in Bungoma, Kilifi, Mombasa, Turkana on the topic: IMPLEMENTATION OF POSSIBLE SEVERE BACTERIAL INFECTION GUIDELINES IN SELECTED COUNTIES IN KENYA for the period ending : 21/July/2022.

License No: NACOSTI/P/21/11771

939309

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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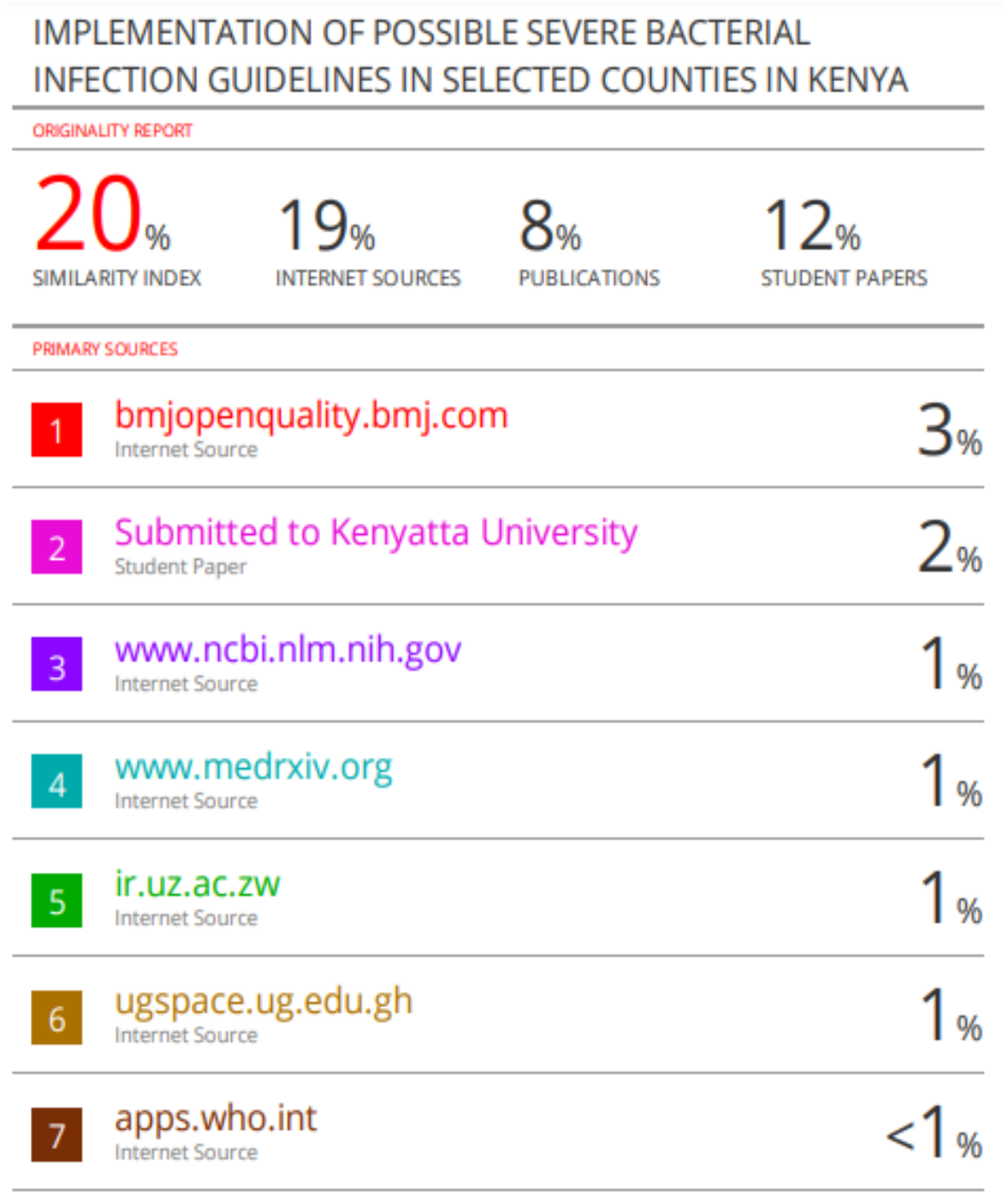
Appendix XV: Similarity index



IMPLEMENTATION OF POSSIBLE SEVERE BACTERIAL INFECTION GUIDELINES IN SELECTED COUNTIES IN KENYA

ORIGINALITY REPORT

20%	19%	8%	12%
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5	ir.uz.ac.zw Internet Source	1%
6	ugspace.ug.edu.gh Internet Source	1%
7	apps.who.int Internet Source	<1%

Appendix XVI: Map of Research Sites