



COUNTY GOVERNMENT OF
MAKUENI
Department of Health Services



MAKUENI COUNTY HEALTH RESEARCH AGENDA 2026–2030



*Generating, governing and using local evidence
for a healthy, empowered and resilient Makueni*

October 2026



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FOREWORD

Makueni County has long been recognised as a pioneer of universal health coverage in Kenya. That reputation was built on a willingness to try new approaches, to learn from them and to adjust. As the health sector absorbs the transition to the Social Health Authority, the Primary Health Care Act, the Digital Health Act and a sharp reduction in external financing, the County's need for timely, locally generated evidence has never been greater.

Health research is already taking place across our facilities and communities. Academic institutions, research organisations and development partners have studied maternal and newborn care, non-communicable diseases, cervical cancer, health financing, mental health and many other subjects in Makueni. Yet much of this work has been driven by external priorities, has not been consolidated in one place, and has not always reached the managers and health workers who could act on it.

This Health Research Agenda is the Department of Health Services' response. It sets out, for the first time, the research questions the County needs answered most over the next five years, the rules by which research in our facilities and communities will be coordinated, and the arrangements through which findings will be turned into decisions, budgets and better services. It is aligned with the Constitution of Kenya 2010, the Kenya Health Policy 2014–2030, the national research-for-health framework and the Makueni County Integrated Development Plan 2023–2027.

I call on researchers, universities, research institutions, development partners and our own health workers to use this agenda: to align their studies with its priorities, to work with county staff as co-investigators, and to share their findings with the County and the communities who take part. The Department, for its part, commits to resource the agenda, to protect the people who participate in research, and to use the evidence it generates.



Joyce Mutua

County Executive Committee Member, Department of Health Services
Government of Makueni County



PREFACE

This agenda serves the people of Makueni by ensuring that county research addresses their most pressing health questions and that findings improve the services they receive. It will guide action in three ways.

First, for the benefit of the people. Every study that involves county health facilities, staff, data or communities will be registered with the Research and Knowledge Management Unit, checked against this agenda, and tracked to completion, publication and use, so that findings return to the communities and services they concern. Researchers will be expected to meet the obligations set out in Section 6.5, including sharing their results with the County.

Second, for accountability. The Department will report annually on the indicators in Chapter 9, carry out a mid-term review in 2028 and an end-term review in 2030, and present progress at the County Health Scientific Conference.

Third, for planning and budgeting. The priorities in Chapter 5 will be reflected in the Department's annual work plans, the Annual Development Plan and the review of the County Integrated Development Plan, and the agenda will support a dedicated budget line for health research and knowledge management.

The County Health Management Team, hospital management teams and sub-county health management teams are responsible for putting this agenda into practice. I thank all who contributed to its development and look forward to working with them in implementing it.



Dr. Harvey Mulei Mbithi

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ACKNOWLEDGEMENT

The development of the Makueni County Health Research Agenda 2026–2030 was a collective effort, and the Department of Health Services is grateful to everyone who contributed.

We thank the County Executive Committee Member and the Chief Officer, Health Human Resource Management and Administration, for their leadership and for providing the policy direction and resources that made this work possible. We are grateful to the Government of Makueni County for funding the process.

We acknowledge the technical working group, made up of members of the County Health Management Team and researchers from the Kenya Medical Research Institute (KEMRI), Jomo Kenyatta University of Agriculture and Technology (JKUAT) and Daystar University, who provided technical guidance throughout. We are grateful to Dr. Moses Mutua (Aga Khan University), Dr. Joseph Kweri (JKUAT), Daystar University and the Directors of Health (Dr. Benard Kasanga, Dr. James Kanyange, Dr. Stephen Mwatha, Dr. Anthony Mathulu, Christopher Yulu and David Kiuluku) for peer reviewing the draft. Much appreciation to the directors, unit and programme heads who completed the research gap analysis tool, and the frontline health practitioners across the county who responded to the survey on research and practice gaps. Their knowledge of where services fall short gives this agenda its practical focus.

Special thanks go to Dr. Caroline Kaeni, the departmental Research and Knowledge Management Coordinator, who coordinated the development of this agenda from inception to validation.

We also thank the hospital and sub-county health management teams, partners and all participants in the drafting and validation workshops. The full list of contributors is provided in Annex 1.



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ABBREVIATIONS AND ACRONYMS

Abbreviation	Meaning
ACF	Active Case Finding
AEA	Average Expert Agreement
AI	Artificial Intelligence
AMR	Antimicrobial Resistance
ANC	Antenatal Care
ART	Antiretroviral Therapy
CECM	County Executive Committee Member
CHMT	County Health Management Team
CHNRI	Child Health and Nutrition Research Initiative
CME	Continuing Medical Education
CHP	Community Health Promoter
CHUSLA	Community Health Units Savings and Loans Associations
CIDP	County Integrated Development Plan
CKD	Chronic Kidney Disease
CQI	Continuous Quality Improvement
CVD	Cardiovascular Disease
DALY	Disability-Adjusted Life Year
DSD	Differentiated Service Delivery
eCHIS	Electronic Community Health Information System
EmONC	Emergency Obstetric and Newborn Care
EMR	Electronic Medical Record
EOC	Emergency Operations Centre
FBO	Faith-Based Organisation

Abbreviation	Meaning
FIF	Facility Improvement Financing
FP	Family Planning
FY	Financial Year
GAM	Global Acute Malnutrition
GBV	Gender-Based Violence
GIS	Geographic Information System
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HPV	Human Papillomavirus
HR	Human Resources
HRH	Human Resources for Health
ICT	Information and Communication Technology
ICU	Intensive Care Unit
IPC	Infection Prevention and Control
ISERC	Institutional Scientific and Ethics Review Committee
JB	Joanna Briggs Institute
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KDHS	Kenya Demographic and Health Survey
KEMRI	Kenya Medical Research Institute
KENPHIA	Kenya Population-based HIV Impact Assessment
KHIS	Kenya Health Information System
KM	Knowledge Management
KMC	Kangaroo Mother Care

Abbreviation	Meaning
KMHFR	Kenya Master Health Facility Registry
KMTC	Kenya Medical Training College
KNBS	Kenya National Bureau of Statistics
M&E	Monitoring and Evaluation
MMR	Maternal Mortality Ratio
MMS	Multiple Micronutrient Supplementation
MNH	Maternal and Newborn Health
MoH	Ministry of Health
MOU	Memorandum of Understanding
MPDSR	Maternal and Perinatal Death Surveillance and Response
MRSA	Methicillin-Resistant Staphylococcus aureus
NACOSTI	National Commission for Science, Technology and Innovation (the national research regulatory body at the time of writing)
NCD	Non-Communicable Disease
NGO	Non-Governmental Organisation
NHIF	National Hospital Insurance Fund
ORS	Oral Rehydration Salts
PBF	Performance-Based Financing
PCN	Primary Care Network
PCV	Pneumococcal Conjugate Vaccine
PEP	Post-Exposure Prophylaxis
PHC	Primary Health Care
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission (of HIV)
PPH	Postpartum Haemorrhage

Abbreviation	Meaning
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews
QI	Quality Improvement
RMNCAH-N	Reproductive, Maternal, Newborn, Child and Adolescent Health and Nutrition
SCHMT	Sub-County Health Management Team
SDG	Sustainable Development Goal
SHA	Social Health Authority
SMART	Standardised Monitoring and Assessment of Relief and Transitions
SMS	Short Message Service
SOP	Standard Operating Procedure
SSI	Surgical Site Infection
STI	Sexually Transmitted Infection
SWOT	Strengths, Weaknesses, Opportunities and Threats
TB	Tuberculosis
TPT	TB Preventive Therapy
TWG	Technical Working Group
UHC	Universal Health Coverage
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

EXECUTIVE SUMMARY

Why this agenda is needed. Makueni County's health sector has reached a point where locally generated evidence must be deliberately organised, governed and used. The county has a growing portfolio of implementation research, operational research, health financing studies, digital health initiatives, nutrition surveys, maternal and newborn health projects, and studies on non-communicable diseases (NCDs), mental health and cervical cancer. This evidence, however, is fragmented, largely partner-driven, often unpublished, and not consolidated in a county-owned repository. Some topics are studied repeatedly while high-burden problems remain unstudied, and findings rarely reach planning and budgeting.

This Health Research Agenda 2026–2030 is the Department of Health Services' first research agenda and one of the first county-level health research agendas in Kenya. It is both a reference document that directs researchers, students and partners to the questions the county needs answered, and a resource mobilisation document that sets out a policy-aligned set of priorities for investment.

How it was developed. The Research and Knowledge Management Unit initiated the agenda in 2025, and the County Health Management Team (CHMT) developed it with technical support from KEMRI, JKUAT and Daystar University. The CHMT reviewed the policy and legal framework and research conducted in or about Makueni since 2015, and analysed routine and survey data (KHIS, KDHS 2022, the 2023 SMART survey). Frontline health practitioners and unit and programme heads added the gaps they see in daily practice. A multi-stakeholder drafting workshop then rated the proposed research focus areas in groups and plenary against seven CHNRI-style criteria: disease burden, equity, feasibility, evidence gap, policy relevance, urgency and potential impact. The draft was validated internally with facility, sub-county and departmental leaders and peer reviewed by academic partners before approval (Sections 2.2 and 2.7).

What the situation analysis shows. The county serves a population of about 1.15 million (2026 KHIS planning estimate) through 361 health facilities, two-thirds of them public. It performs above national averages on most maternal and child health coverage indicators: in 2025/26, 69% of pregnant women made four antenatal visits (national 48%) and 98% of infants were fully immunised. These gains in coverage have not been matched by gains in outcomes. The facility neonatal death rate rose from 9.3 to 10.1 per 1,000 live births between 2021/22 and 2025/26 and is now above the national figure of 9.3. The facility maternal mortality ratio rose from 51 to 87 per 100,000 deliveries after 2023/24. Hypertension is the second most common outpatient

condition among people over five years and the leading recorded cause of inpatient death. Anaemia, diabetes and pneumonia are also among the leading causes of admission and death. Low birth weight, birth asphyxia and prematurity account for most deaths among children under five (Chapter 3).

What research already exists. The mapping in Chapter 7 and the first round of the scoping review identified 18 county-anchored research and implementation activities and 27 published studies and theses with Makueni-specific findings. Evidence is concentrated in maternal and newborn health and in health financing. Implementation is strong but documentation is weak: only two of the 18 county-anchored activities have produced a public report or publication. Several high-burden areas, including injuries, emergency and critical care, neonatal sepsis, kidney disease, TB and HIV treatment outcomes, have little or no county evidence.

What health workers and programme managers report. In a survey of 51 frontline practitioners in October 2026, 71% named inadequate staffing and 53% commodity stock-outs as recurring problems, 59% reported that patients present late for care, and 41% named diabetes and hypertension as common but poorly managed. Maternal, newborn, child and adolescent health (61%) and NCDs (53%) were their leading priority areas. These reports agree with the burden data on NCDs and newborn outcomes, and add problems that published research has not addressed, notably infant gum cutting, childhood disability and access to rehabilitation (Section 2.4). Thirteen unit and programme heads documented gaps, mostly backed by programme data: only 46% of estimated TB cases were notified in 2025, third delays accounted for 73% of the factors contributing to maternal deaths in 2025/26, 78% of cancer patients present at a late stage, and only 44% of villages are certified open defecation free (Section 2.5).

Priorities for 2026–2030. The agenda organises research into fifteen thematic areas (Chapter 5), provisionally grouped into three tiers:

- **Tier 1 (flagship):** reproductive, maternal, newborn, child and adolescent health and nutrition (RMNCAH-N) and quality of care; NCDs and multimorbidity; cancer prevention and control; communicable diseases, HIV, TB, malaria and antimicrobial resistance; injuries, violence, emergency and critical care; and health financing and UHC.
- **Tier 2:** nutrition, food security and climate-sensitive health; community health systems and PHC; public health emergencies, One Health and climate change; mental health, substance use, disability and rehabilitation; specialised clinical, surgical and palliative care; and environmental health, WASH and health promotion.

- **Cross-cutting enablers:** digital health, data science and AI; diagnostics, health products and technologies; health workforce, quality of care and patient safety; and the socio-cultural beliefs, behaviours, attitudes and perceptions of communities, patients and health workers, which shape care-seeking and the uptake of services across every priority theme (Section 5.6).

A disease-level evidence gap analysis covering 20 conditions (Annex 2) and a set of health systems research priorities organised around the eight policy orientations of the Kenya Health Policy (Section 5.5) give these themes practical detail. The tiers will be confirmed or revised by CHNRI-style scoring, which rates research focus areas on disease burden, equity, feasibility, evidence gap, policy relevance, urgency and potential impact (Section 2.6). Table 5.2 rates the fifteen themes against these criteria using the evidence in this agenda.

Validation added, as a cross-cutting enabler, the study of socio-cultural behaviours, attitudes and perceptions, which drive late care-seeking, defaulting, harmful practices and stigma across the priority themes (Section 5.6). It also moved injuries, violence, emergency and critical care to Tier 1.

Top-ranked priorities. Against the seven criteria, cancer prevention and control ranks highest (14 of 14), followed by RMNCAH-N and quality of care, NCDs and multimorbidity, communicable diseases and AMR, and community health systems and PHC (12 each) (Table 5.2). The leading research questions in the top-ranked areas are:

- **Cancer prevention and control:** What are the barriers to accessing oncology services, from screening to diagnosis, treatment and referral, and why do 78% of patients present at a late stage?
- **Cancer prevention and control:** What proportion of women who screen positive for HPV or precancerous lesions complete treatment, and what causes drop-out?
- **RMNCAH-N:** What are the causes and avoidable factors of the rise in facility neonatal deaths since 2021/22, by facility and sub-county?
- **RMNCAH-N:** What is the effect of the AMPLI-PPH study on PPH-related maternal deaths and severe morbidity in Makeni facilities?
- **NCDs:** What proportion of adults with hypertension and diabetes are diagnosed, treated and controlled, and where are they lost in the care cascade within Primary Care Networks?
- **Communicable diseases and AMR:** Which strategies will most effectively close the TB notification gap (46% of estimated cases notified in 2025) and reach at least 90% notification by 2030?

- **Communicable diseases and AMR:** What are the pathogens and resistance patterns of urinary tract infections and neonatal sepsis in county facilities?
- **Injuries and emergency care:** What are the causes, settings and outcomes of injuries among children under five?
- **Community health and PHC:** What drives late presentation for care, and which community health interventions shorten delays in care-seeking?
- **Health financing and UHC:** What has been the effect of the SHA transition and Facility Improvement Financing on facility revenue, service use and out-of-pocket spending?

The full long list is in Table 5.4.

How the agenda will be governed and delivered. The County Health Research and Knowledge Management Unit will coordinate the agenda, maintain a living research inventory and repository, register and authorise studies after ethics approval and licensing by the national research regulatory body, build staff capacity, and track how findings are used (Chapter 6). Implementation is organised under ten strategic objectives (Section 8.2), from governance and capacity building to the delivery of Tier 1 research and sustainable financing. The agenda emphasises low-cost, high-impact approaches, such as analysis of routine data, research embedded in quality improvement, and student research aligned to county priorities. These are combined with strategic partnerships and SMART advocacy for a dedicated research budget line (Section 8.5). Progress will be tracked through a quarterly dashboard and reviewed at mid-term (2028) and end-term (2030) (Chapter 9).

Next agenda. Chapter 12 recommends how the next agenda, after 2030, should be developed: starting from the end-term evaluation, with a complete and living evidence base, wider participation and costed priorities. It is likely to focus on scaling up interventions that work, ageing and NCDs, cancer and environmental exposures, climate and health, One Health, sustainable financing and digital health.

A call to action. The Department invites researchers, universities, research institutions, development partners and health workers to align their work with this agenda, to involve county staff as co-investigators, to share data and findings with the county, and to invest in the questions that matter most for the health of the people of Makeni.

1. Introduction

1.1 Background

Research is how a health system learns. It tells managers whether services reach the people who need them, whether interventions work as intended in local conditions, and where money and staff will do the most good. For a county government responsible for delivering health services under the Constitution of Kenya 2010, research and the knowledge it generates are essential tools of good management, not an academic extra.

Makueni County has a strong foundation to build on. The county is nationally recognised for its early commitment to universal health coverage, which has itself been the subject of several studies [14,15,20]. The Department of Health Services has established a research and knowledge management coordination function, supports staff to present at scientific conferences, and has hosted a growing number of studies by universities, research institutions and partners on maternal and newborn health, non-communicable diseases, cervical cancer, antimicrobial resistance, mental health and health financing.

The problem is not a lack of research activity but inadequate direction and consolidation. Research in the county is driven largely by individual investigators, academic institutions and partners. Studies are approved and conducted, but they are not systematically matched to the county's disease burden, service delivery gaps or policy questions. Results are often kept in internal reports, presentations and conference abstracts, and are rarely fed back into planning, budgeting or quality improvement. The county does not yet have a single inventory of the research conducted within it, or a repository where findings can be found and reused.

1.2 Rationale for a County Health Research Agenda

This agenda responds to that problem and serves two main purposes.

First, it is a reference document. It directs the Department, researchers, students and partners to the questions the county needs answered and gives the research coordination function a clear basis for aligning incoming studies with county priorities.

Second, it is a resource mobilisation document. It provides a costed, policy-aligned set of priorities that the Department can present to development partners, research institutions, national funding bodies and competitive grant calls, and that can justify a dedicated county budget line for research.

The agenda also responds to national direction. The national research-for-health framework and programme-specific agendas, such as the National Reproductive Health Priority Research and Learning Agenda 2022–2027, call on counties to domesticate national research priorities. As one of the first county-level health research agendas in Kenya, this document adapts national and global priorities to Makueni's context and positions the county to contribute evidence of national value, particularly on primary health care, UHC and health in semi-arid settings.

1.3 Vision, Mission and Goal

Vision: Generating, governing and using local evidence for a healthy, empowered and resilient Makueni.

Mission: To promote, coordinate and institutionalise ethical, high-quality health research, innovation and knowledge management, so that evidence is generated, translated and applied to inform policy, programming, financing and service delivery in Makueni County.

Overall goal: To strengthen the generation, translation, dissemination and use of locally relevant evidence for improved health outcomes, universal health coverage, equity and resilient health systems in Makueni County.

1.4 Objectives of the Agenda

The specific objectives of this agenda are:

1. To define priority health research areas and questions for Makueni County for 2026–2030, informed by disease burden, health system gaps and policy commitments.
2. To strengthen the coordination, governance and accountability of health research in the county, reducing duplication and aligning partner-led research with county priorities.
3. To build institutional and individual capacity for research, knowledge management and evidence use within the Department of Health Services.
4. To promote the translation, dissemination and use of research evidence in policy, planning, budgeting and service delivery.
5. To provide a basis for resource mobilisation and partnerships for health research in the county.

1.5 Scope, Target Audience and Use

Scope. The agenda covers all health research, implementation science, operational research, programme evaluations, quality improvement studies and student research that involve county health facilities, staff, data or communities, for the period 2026–2030. It also covers the systems needed to govern, finance and use that research.

Target audience. The agenda is written for departmental leadership and the County Health Management Team; programme managers, hospital management teams and sub-county health management teams; health workers of all cadres; research institutions; universities, colleges and students; development and implementing partners; funders; regulatory bodies; the County Assembly; and communities.

Use. The Department expects all stakeholders to consult this agenda before undertaking health research in Makueni, to explain how their proposed research relates to it, to share findings with the Department and participating communities, and to use it to guide investment in health research. Research outside the listed priorities is not prohibited, but researchers are expected to explain its relevance to the county.

1.6 Guiding Principles and Core Values

The agenda is grounded in the Constitution of Kenya 2010, the Health Act 2017, the Data Protection Act 2019 and the national research-for-health framework. In line with the Kenya Health Policy 2014–2030, it adopts the policy principles of equity, people-centredness, a participatory approach, efficiency, social accountability and a multisectoral approach to health [10]. Research conducted under this agenda is further guided by the following core values:

Core value	What it means in practice
Integrity and ethics	Honesty, transparency and ethical conduct in all research; respect for persons and protection of participants' rights, safety and dignity.
Scientific rigour and quality	Sound designs, valid methods, accurate reporting and responsible authorship.
Equity and inclusion	Research that represents and benefits rural, marginalised and underserved communities, and reports results by sex, age, disability and sub-county.
Community responsiveness	Research that addresses the real needs of Makueni's people, involves communities in setting questions, and reports back to them.

Core value	What it means in practice
Collaboration and partnership	Co-creation with national, academic, implementing and community partners, with fair sharing of data, credit and benefits.
Confidentiality and data protection	Lawful, secure and proportionate use of personal and health data.
Transparency and accountability	Open registration of studies, declared conflicts of interest and responsible stewardship of public and partner resources.
Innovation and learning	Openness to new methods, technologies and solutions tailored to Makueni's context, and willingness to learn from what does not work.
Evidence into action	Research designed from the outset to inform decisions, and findings that are translated into policy, practice and budgets.
Sustainability	Research capacity and systems embedded in county structures for long-term impact.

1.7 Structure of the Document

Chapter 2 describes how the agenda was developed, including the scoping review protocol and the CHNRI-style prioritisation method. Chapter 3 presents the situation analysis: the county context, health indicators, burden of disease, the Department of Health Services and the research landscape. Chapter 4 sets out the policy, legal and regulatory framework. Chapter 5 presents the priority research areas. Chapter 6 describes research governance, coordination and partnerships. Chapter 7 maps the research, implementation science and evidence activities already under way. Chapter 8 sets out the implementation framework, Chapter 9 the arrangements for monitoring, evaluation, learning and reporting, Chapter 10 the main risks and their mitigation, and Chapter 11 the emerging research frontiers. Chapter 12 sets out recommendations for the next health research agenda. References are listed in Chapter 13, and supporting material is provided in the annexes.

2. Development of the Agenda

2.1 Approach

The agenda was developed through a county-led, consultative and evidence-informed process. The Research and Knowledge Management Unit of the Department of Health Services initiated the process, and the County Health Management Team (CHMT) carried out the evidence reviews and contributed to identifying research priorities. Research teams from KEMRI, JKUAT and Daystar University provided technical support, including during the drafting workshop.

The process combined evidence review, stakeholder surveys, research gap assessment and structured prioritisation. Each source of evidence answers a different question, and together they allow each to check the others:

1. **Desk review of policy, legal and planning documents (Chapter 4):** what the agenda must align with.
2. **Scoping review of research conducted in or about Makueni, 2015–2025 (Section 2.3), and mapping of current activities (Chapter 7):** what is already known, and where evidence is thin.
3. **Situation analysis of routine and survey data (Chapter 3):** where the burden of illness and death is greatest, and how it is changing.
4. **Frontline health practitioner survey (Section 2.4):** which problems health workers face every day, including those no study has examined.
5. **Unit and programme heads' research gap analysis (Section 2.5):** which gaps programme managers see, the data behind them, and how urgent they are.

The output is a set of thematic areas and prioritised research focus areas. These guide resource mobilisation and allow universities, KMTC, health facilities, students, research institutions and other partners to align their studies with county evidence needs. Specific research questions, methods and protocols are developed within these focus areas.

2.2 Steps in the Development Process

The agenda was developed in six steps.

1. **Ideation and inception.** In 2025 the Research and Knowledge Management Unit initiated the agenda to establish a county-owned framework for directing research towards priority health needs. Inception set the purpose, scope and thematic organisation of the agenda,

constituted a technical working group of CHMT members and partner researchers, and agreed the approach to evidence review, stakeholder engagement and prioritisation.

2. **Desk and scoping review.** The CHMT reviewed research conducted in or about Makueni County (Section 2.3), county health reports, KHIS data, KDHS findings, health-service dashboards and policy and planning documents, including the Makueni CIDP 2023–2027 and the Kenya Health Policy 2014–2030 (Chapter 4). Existing findings and recommendations were set against the county's epidemiological profile (Chapter 3) and current research activities (Chapter 7) to identify unresolved evidence gaps and map thematic areas.
3. **Stakeholder surveys and research gap assessment.** Frontline health practitioners completed a short online survey (Section 2.4), and unit, section and programme heads documented gaps through a structured research gap analysis tool (Section 2.5). These contributions were considered alongside the desk review and situation analysis to refine the proposed research focus areas.
4. **Drafting workshop and prioritisation.** A three-day multi-stakeholder drafting workshop, held at Semara Hotel, Machakos, on 6–8 October 2026 with technical support from KEMRI, JKUAT and Daystar University, refined the proposed focus areas through presentations, thematic group discussions and plenary deliberations. The focus areas were rated in thematic groups and plenary against seven CHNRI-style criteria: disease burden, equity, feasibility, evidence gap, policy relevance, urgency and potential impact (Section 2.6). Prioritised focus areas were consolidated under their themes.
5. **Report drafting.** The drafting team integrated the evidence summaries, thematic submissions and prioritisation results into one draft. It harmonised terminology, merged overlapping focus areas, placed each priority within its theme, and linked each to the county context and the evidence gap behind it. A technical review checked the draft for clarity, consistency and completeness.
6. **Validation and approval.** The draft was validated internally through a consultation meeting with facility in-charges and facility representatives, sub-county medical officers of health, the CHMT and top departmental leadership, and was peer reviewed in tandem by academic partners from Aga Khan University (AKU), Daystar University and JKUAT (Section 2.7). Agreed changes were incorporated before submission for approval by the CECM, Health Services, through the county approval pathway, and the agenda is anchored in the Research and Knowledge Management Unit.

2.3 Scoping Review: Rationale and Methods

A scoping review was used to map the health research conducted in or about Makueni County between 1 January 2015 and 30 June 2025. Its aims were to identify where evidence is concentrated or absent and to document the gaps and recommendations reported by previous studies. The review follows the six-stage framework of Arksey and O'Malley [49], as refined by Levac and colleagues [50] and by the Joanna Briggs Institute (JBI) [69], and is reported according to the PRISMA extension for Scoping Reviews (PRISMA-ScR) [51]. The first round of searching, conducted in October 2026, covered PubMed, the Directory of Open Access Journals (DOAJ) and a general web search engine, supplemented by county records and partner documents; additional review of bibliographic databases, Google Scholar, registries and repositories was conducted by the review team (Section 2.3.4). The review protocol was not prospectively registered.

2.3.1 Rationale for the review

Makueni has hosted a growing volume of health research since health services were devolved in 2013, by universities, research institutions, partners and county staff. That research has never been compiled. Studies are scattered across journals, theses, partner reports and conference abstracts, many are unpublished, and the county holds no single inventory of what has been studied, by whom and with what result (Section 1.1).

An agenda that ignored this evidence would risk funding questions that have already been answered, overlooking recommendations that were never acted on, and missing areas where no county evidence exists. The review therefore supplies the evidence base for three parts of this agenda: the evidence gap criterion in the prioritisation (Table 2.6), the evidence map against the burden of disease (Section 7.4), and the baseline of the living research inventory (Section 7.7).

A scoping review, rather than a systematic review, was chosen because the aim is to map the extent, range and nature of a broad and varied body of evidence, not to answer a narrow question about effectiveness. Scoping reviews accept all study designs and grey literature and do not pool results, which suits a first county-wide stock-take spanning clinical, public health, health systems and policy research [69]. The period from 2015 covers the decade after devolution, including the launch of the county's universal health coverage scheme, MakueniCare, in 2016, and the first phase of the transition to the Social Health Authority. As is usual for scoping reviews, the methodological quality of included studies was not formally appraised; study design, publication status and verification level were charted instead (Section 2.3.7).

2.3.2 Objectives and review question

What health research has been conducted in or about Makueni County between 1 January 2015 and 30 June 2025, what did it find, and what evidence gaps and recommendations did it identify?

The specific objectives of the review are to:

1. Identify and map health research conducted in or about Makueni County and published or completed between 1 January 2015 and 30 June 2025;
2. Describe its characteristics: thematic area, study design, setting, population, funder, lead institution and involvement of county staff;
3. Summarise its key findings, and the evidence gaps and recommendations stated by the authors;
4. Compare the volume of research in each thematic area with the burden of disease and health system gaps (Chapter 3);
5. Assess whether findings were shared with the county and used in policy, programmes or quality improvement; and
6. Provide the baseline records for the county research inventory (Section 7.7).

2.3.3 Eligibility criteria

Eligibility is defined with the JBI Population–Concept–Context framework, with further criteria for study design, period, source type and language (Table 2.1). A record is included only if it meets every inclusion criterion and no exclusion criterion.

Table 2.1: Eligibility criteria for the scoping review

Criterion	Inclusion	Exclusion
Population	Residents, patients, health workers, health facilities or communities in Makueni County, of any age and sex	Populations outside Makueni; studies in which Makueni appears only in an author's affiliation
Concept	Primary research on any health topic: epidemiological, clinical, laboratory, operational, implementation, health systems, policy, economic, qualitative and mixed-methods studies; programme evaluations; quality improvement studies and clinical audits with documented methods; environmental and One Health studies that report a human health outcome or exposure	Editorials, commentaries, opinion pieces, news items and programme descriptions without data; protocols without results (listed in the research inventory as ongoing); studies of animals, vectors or the environment with no link to human health

Criterion	Inclusion	Exclusion
Context	Studies conducted wholly in Makueni; multi-county or national studies in which Makueni is a named site and its results are reported separately; county reports of national surveys, such as KDHS county fact sheets and SMART surveys	Multi-county or national studies with no Makueni-specific results
Study design	All quantitative, qualitative and mixed methods designs, including secondary analysis of routine data	Reviews and syntheses without Makueni-specific primary data (their reference lists are searched for eligible studies)
Time period	Published, or completed if unpublished, between 1 January 2015 and 30 June 2025	Published or completed before 1 January 2015 or after 30 June 2025
Source type	Peer-reviewed articles; theses and dissertations; technical, survey, programme and partner reports; conference abstracts that report methods and results; county research records	Abstracts without methods or results; duplicate reports of the same study (the most complete version is kept and companion reports are linked to it)
Language	English or Kiswahili	Other languages

Studies published after 30 June 2025 that came to light during drafting, such as the KEMRI–county HPV study, are listed in Chapter 7 and Annex 5 but fall outside the review period. They will be included in the first update of the review.

2.3.4 Information sources and search engines

Sources were chosen to capture both published research and the large share of county research that never reaches a journal. The first round of searching, conducted in October 2026 with the support of an AI research tool [86], covered the following sources:

- **PubMed** (web interface), searched on 19 October 2026 for "makueni" in all fields, limited to 2015–2025: 79 records. Automated access to the records was blocked, so their titles and abstracts are being screened manually by the review team.
- **Directory of Open Access Journals (DOAJ)**, searched on 19 October 2026 for "Makueni": 103 records, of which the 31 retrievable through automated access were screened.
- **General web search engine**, queried on 19 October 2026 with 21 theme-specific strings (194 results). The results reached journal websites, PubMed Central and the institutional

repositories of Kenyatta University, South Eastern Kenya University, the University of Nairobi, Mount Kenya University, Daystar University, Kabarak University and Amref.

- **Preliminary searches and county records** (8 and 16 October 2026): web and DOAJ searches carried out during drafting, and county documents and partner records supplied by the Department. These identified 17 published studies and 18 county-anchored activities (Chapter 7).

Europe PMC was also attempted but did not permit automated access and was not searched. Table A5.2 records each search. To complete the review, the review team will search the following sources, which were not accessible in the first round:

- **Bibliographic databases:** PubMed/MEDLINE; Scopus and Web of Science Core Collection, through institutional or Research4Life access; the Cochrane Library; African Journals Online (AJOL); and the WHO Global Index Medicus, which includes the African Index Medicus.
- **Academic search engine:** Google Scholar, screening the first 200 results of each search string sorted by relevance, and its "cited by" function for forward citation searching of included studies.
- **Trial and study registries:** the Pan African Clinical Trials Registry and ClinicalTrials.gov, for trials and studies with a Makueni site.
- **Theses and institutional repositories:** KEMRI; universities with health research links to the county, including the University of Nairobi, JKUAT, Kenyatta University, Daystar University, South Eastern Kenya University, Machakos University and Strathmore University; KMTTC; and ProQuest Dissertations and Theses.
- **Grey literature:** county research authorisation records held by the Research and Knowledge Management Unit; licensing records of the national research regulatory body where accessible; KNBS and the Kenya National Data Archive (KDHS, SMART and KENPHIA reports); Ministry of Health and county government websites; partner and programme reports; and abstracts from county, national and regional scientific conferences, such as the KEMRI Annual Scientific and Health Conference.
- **Other sources:** reference lists of included studies and of relevant reviews; the bibliography in Annex 5; and consultation with programme coordinators and partners to identify unpublished and ongoing work.

In the first round, grey literature was limited to county and partner records supplied by the Department and to national survey reports (KDHS and SMART). Partner and programme reports,

conference abstracts and unpublished theses were not searched systematically; they will be covered when the review is updated through the living research inventory (Section 7.7).

2.3.5 Search strategy

The literature specific to Makueni is small, so bibliographic databases are searched with place names alone, without health terms, to avoid missing studies on nutrition, water, environment and social determinants. Place names cover the county, its six sub-counties and its main towns. Google Scholar returns far more records, so there the place names are combined with broad health terms in several theme-specific strings. Searches are limited to 1 January 2015–30 June 2025 with no language filter, and the strategy for the remaining databases is reviewed by a librarian or KEMRI information specialist before it is run. The PubMed string is shown below and is adapted for each database:

```
("Makueni"[tiab] OR "Makueni"[ad] OR "Wote"[tiab] OR "Kibwezi"[tiab] OR  
"Makindu"[tiab] OR "Mtito Andei"[tiab] OR "Emali"[tiab] OR "Sultan Hamud"[tiab] OR  
"Mbooni"[tiab] OR "Kilungu"[tiab] OR "Kaiti"[tiab] OR "Kilome"[tiab] OR "Nunguni"[tiab]  
OR "Kathonzweni"[tiab] OR "Matiliku"[tiab] OR "Kiboko"[tiab] OR "Ukambani"[tiab]) AND  
("2015/01/01"[dp] : "2025/06/30"[dp])
```

An illustrative Google Scholar string, limited to 2015–2025, is:

```
Makueni AND (health OR disease OR hospital OR maternal OR child OR nutrition OR HIV  
OR tuberculosis OR cancer OR "mental health" OR "health financing")
```

Some place names also occur elsewhere (Kaiti, for example, is also a place in New Zealand) or are common words (wote means "all" in Kiswahili); such records are removed at screening. The final string, date of search and number of records retrieved for every source are recorded in a search log (Table A5.2).

In the first round, the web search engine was queried with 21 short strings that combine "Makueni", or the names of sub-county towns, with a health theme (for example, "Makueni cervical cancer screening study"). The strings are listed in Table A5.2.

2.3.6 Selection of sources of evidence

Records are imported into Zotero, de-duplicated and screened in Rayyan. Two reviewers screen titles and abstracts independently, and then full texts, against the eligibility criteria. The criteria are first piloted on a sample of 25 records and refined until the reviewers agree on at least 80% of decisions. Where the two reviewers disagree, they first discuss the record against the eligibility criteria; disagreements that remain are decided by a third reviewer, a senior researcher with postgraduate research training and experience in conducting systematic or

scoping reviews. Reasons for excluding full texts are recorded, and authors or programme leads are contacted once where a full text or key detail is missing.

First screening. In the first round, each retrieved record was screened against Table 2.1 with the support of an AI research tool [86], using its title, search snippet and, where accessible, abstract or full text, and one reason was recorded for each exclusion. The full text or repository record of every potentially eligible record was opened before inclusion. Records that could not be opened or classified were set aside for the review team rather than excluded. To guard against missed or misclassified studies, two reviewers check every included record, every record set aside and a random sample of at least 20% of the exclusions. If they disagree with more than 5% of the sampled exclusions, all exclusions are re-screened by hand.

2.3.7 Data charting

A standard charting form (KoboCollect or Excel) is piloted on five studies and refined. The fields are shown in Table 2.2; they correspond to the minimum data set of the county research inventory (Table 7.7), so that charted studies can be loaded directly into the inventory.

Table 2.2: Data charting fields

Field	Description
Citation details	Authors, year, title, source, publication status (published, unpublished, thesis, abstract)
Thematic area	Primary and secondary theme (Section 5.1); Kenya Health Policy objective and orientation (Sections 4.3 and 5.5)
Verification level	Verified (publicly available source) or to validate (internal or partner record), as defined in Section 7.2
Study design and methods	Design, data sources, sample size, period of data collection
Setting	Sub-county, facility level (community to Level 5) and facility type
Population	Target population, age group and sex
Funder and lead institution	Funding source; lead and partner institutions; county staff involvement
Key findings	Main results in two to three sentences
Gaps and recommendations	Evidence gaps and recommendations stated by the authors
Dissemination and use	Whether findings were shared with the county; evidence of uptake in policy, programmes or CQI

Consistent with JBI guidance, included studies are not formally appraised for methodological quality, because the aim is to map the evidence rather than weigh it [69]. Study design, publication status and verification level are charted instead, so that the evidence map can distinguish peer-reviewed studies from internal reports.

2.3.8 Collating, summarising and reporting

Results are presented as a descriptive numerical summary (studies by year, theme, design, sub-county and funder) and as an evidence map showing the volume of research per theme against the burden and health system gaps identified in the situation analysis (Chapter 3 and Section 7.4). A narrative synthesis summarises the gaps and recommendations by theme. The final stage of the framework, stakeholder consultation, is fulfilled through the practitioner survey (Section 2.4), the unit heads' gap analysis (Section 2.5) and the technical working sessions.

2.3.9 PRISMA-ScR flow

Table 2.3 shows the flow of records in the first round of screening. The numbers are provisional until the review team has screened the records set aside and searched the remaining sources; the PRISMA-ScR flow diagram and checklist will then be completed.

Of 411 records identified, 151 could not be opened by the assistant and 260 were screened. After 48 duplicates were removed, 129 records were excluded at screening: news items and government web pages (80), studies outside Makueni or without Makueni-specific results (20), records outside the review period (14) and records with no human health link (15). A further 36 could not be classified and were set aside for the review team. Of 47 records assessed in full, two were excluded because they did not report Makueni-specific results, leaving 27 published studies and theses (Table 7.3) and 18 county-anchored activities that await verification (Table 7.2).

Table 2.3: Flow of records through the scoping review (first round)

Stage	Records (n)
Identified: databases (PubMed 79; DOAJ 103)	182
Identified: web search engine (21 strings)	194
Identified: earlier searches, county records and consultation	35
Not opened during first screening (PubMed 79; DOAJ 72); set aside for the review team	151
Records screened	260
Duplicates removed	48

Stage	Records (n)
Excluded at screening (not research 80; outside Makueni or no county-specific results 20; outside period 14; no human health link 15)	129
Not classified; set aside for the review team	36
Full texts or records assessed for eligibility	47
Excluded at full text (no Makueni-specific results)	2
Included: published studies and theses (Table 7.3)	27
Included: county-anchored activities awaiting verification (Table 7.2)	18
Awaiting screening by the review team (151 + 36)	187

2.4 Health Practitioner Survey on Research and Practice Gaps

Many important gaps never appear in published research, because nobody has studied them. To capture these, a short online survey was shared with frontline health practitioners who encounter gaps in their daily work. Target respondents included nurses at the county referral hospital and other facilities (maternity, intensive care, renal, oncology and general wards), general surgeons, physicians, pharmacists, laboratory officers, radiographers, nutritionists, public health and disease surveillance officers, and health records and information officers. The questionnaire is provided in Annex 6.

The questionnaire had 13 items in four sections: respondent profile; health problems (conditions seen often but poorly understood or managed, recurring service-delivery challenges, and patient or community practices that affect outcomes); research priorities (the one question the Department should fund, and up to three of nine priority areas); and research engagement. The core problem questions were open-ended, so that answers reflect practitioners' own experience. Closed responses were tallied and open-ended responses were coded into themes. One response could fall under several themes, so percentages do not add up to 100%.

Respondents. Fifty-one practitioners responded on 5–6 October 2026. Most were experienced and hospital-based: 71% had practised for ten years or more; 49% worked in sub-county hospitals, 25% at the county referral hospital and 24% in administration or management, and one at a dispensary. Rehabilitation cadres (physiotherapists, occupational therapists and orthopaedic technologists) were the largest group (25%), followed by doctors (20%), nurses (16%), laboratory staff (12%), nutritionists (10%), pharmacy staff (8%) and public health officers (6%). No clinical officers or community health workers responded, so primary care and community perspectives are under-represented.

Main findings. Maternal, newborn, child and adolescent health (61%) and NCDs, including cancers and mental health (53%), were the leading priority areas, followed by community health (41%), health financing and SHA (39%) and health products and supplies (37%). Inadequate staffing (71%) and commodity stock-outs (53%) were the most frequent recurring challenges. Late presentation for care (59%) and treatment defaulting (39%) were the main patient behaviours affecting outcomes, and 11 respondents (22%) each raised infant gum cutting and the use of herbal remedies. Diabetes and hypertension were the conditions most often described as common but poorly managed (41%). Table 2.4 maps the findings to the thematic areas in Section 5.1.

Table 2.4: Research and practice gaps identified by practitioners, by theme

Thematic area (Section 5.1)	Survey signal, n (%) of 51	Most frequently cited gaps	Example research questions proposed
1. RMNCAH-N and quality of care	Priority area 31 (61%); gum cutting 11 (22%); late ANC 9 (18%)	Maternal and neonatal deaths; late antenatal booking and home deliveries; teenage pregnancy; infant gum cutting and its complications (sepsis, acute kidney injury)	What measures will reduce maternal and neonatal deaths? What drives gum cutting in the community?
2. NCDs and multimorbidity	Priority area 27 (53%); diabetes, hypertension and other cardiometabolic NCDs 21 (41%)	Late detection, poor control and poor follow-up of diabetes and hypertension; complications such as CKD and diabetic foot	Which factors affect control of chronic disease in patients on follow-up? Why are NCDs increasing, with poor adherence among those in care?
3. Cancer prevention and control	Cancers 6 (12%)	Oesophageal and prostate cancers; bone tumours; palliative care needs	No question proposed; prostate cancer volunteered as a study topic
4. Communicable diseases, HIV, TB, malaria and AMR	Infectious diseases 11 (22%); AMR priority area 11 (22%)	TB contact management and preventive therapy; drug-resistant TB; TB/HIV; hepatitis B; STIs; AMR	Which strategies best improve TB case finding and preventive therapy uptake?
5. Nutrition, food security and climate-sensitive health	Priority area 14 (27%); malnutrition 5 (10%)	Malnutrition in children and in pregnant and breastfeeding mothers; nutrition commodity stock-outs; feeding practices	What are the barriers and enablers to breastfeeding in the county?

Thematic area (Section 5.1)	Survey signal, n (%) of 51	Most frequently cited gaps	Example research questions proposed
6. Community health systems and PHC	Priority area 21 (41%); late presentation 30 (59%); defaulting 20 (39%)	Delayed care seeking; defaulting; herbal remedies 11 (22%); myths and religious beliefs 10 (20%); cost and transport 9 (18%)	Why do patients default from clinics? What contributes to poor health-seeking behaviour?
7. Health financing and UHC	Priority area 20 (39%)	Waivers when patients cannot pay under SHA; rehabilitative services not covered by insurance	What is the optimum funding model for a Level 4 facility?
8. Digital health, data science and AI	Priority area 9 (18%); record-keeping and data systems 8 (16%)	Manual HMIS data entry; poor record-keeping	No question proposed
10. Mental health, substance use, disability and rehabilitation	Musculoskeletal 11 (22%); childhood disability 6 (12%); stroke 6 (12%); mental health and substance use 4 (8%)	Shortage of therapists, equipment and space; beliefs that disability is a curse; autism and cerebral palsy reported as rising	Which occupational therapy interventions most improve functional independence? What explains the rise in autism among children under four?
11. Injuries, violence, emergency and critical care	Weak or delayed referrals 10 (20%); trauma raised under "Other"	Late referrals and poorly equipped ambulances; trauma outcomes	What factors are associated with poor outcomes in trauma patients?
12. Specialised clinical, surgical and palliative care	Kidney disease 4 (8%); surgical conditions 3 (6%); eye conditions 2 (4%)	Rising amputations; paediatric acute kidney injury; glaucoma and diabetic eye disease	What factors contribute to rising amputation rates at Makueni County Referral Hospital?
13. Diagnostics, health products and technologies	Stock-outs 27 (53%); products priority area 19 (37%); laboratory priority area 13 (25%); equipment 9 (18%)	Stock-outs of medicines, reagents and nutrition commodities; lack of or faulty equipment	Which priority medicines meet most of the county's health needs?

Thematic area (Section 5.1)	Survey signal, n (%) of 51	Most frequently cited gaps	Example research questions proposed
14. Health workforce, quality of care and patient safety	Staffing and workload 36 (71%); patient flow and waiting times 11 (22%)	Understaffing, including facilities closing for lack of staff; long waiting times; health worker mental health	How is inadequate staffing affecting quality of care? What are the levels of depression, anxiety, stress and substance use among health workers?

n (%) = respondents mentioning the item, of 51. Priority areas come from the closed question (up to three choices; nine respondents chose more); other figures come from coded open-ended answers. Themes 9 and 15 were not raised. Source: Practitioner Research Gaps Survey, October 2026.

Practitioners described problems on three time horizons. Emerging problems, described as rising or newly common, included NCD complications (kidney disease, diabetic foot and amputations), autism and cerebral palsy, drug-resistant TB, AMR, and mental health and substance use. Recurring problems included stock-outs, patient flow, weak referrals and loss to follow-up. Perennial problems, persisting despite existing programmes, included understaffing, maternal and neonatal deaths, late antenatal booking and gum cutting. Perennial problems call mainly for implementation research into why existing interventions are not working; emerging problems for burden and risk-factor studies; and recurring system problems for quality improvement and health systems research.

What the open-ended answers showed. The open-ended questions were coded into themes (Table 2.4). They explain why care fails, not only where. Practitioners linked poor control of diabetes and hypertension to late detection, defaulting and stock-outs; described harmful practices such as infant gum cutting and the use of herbal remedies; and pointed to beliefs that delay care for children with disabilities. Two answers illustrate this:

"Practices like gum cutting for the infants that complicates into sepsis, dehydration and acute kidney injury."

"The belief that disability is a curse or was as a result of abortion has delayed/made most cases to be neglected, e.g. club foot, cerebral palsy."

These accounts shaped the research questions on gum cutting, defaulting, late presentation and childhood disability in Table 5.4, and the inclusion of rehabilitation and childhood disability in Theme 10.

Almost all respondents (49, 96%) were willing to take part in future research, and 32 (63%) had taken part in research or quality improvement before. Prior involvement was lowest among staff

with 5–14 years of practice (about half), who may gain most from mentorship. The volunteers form a ready pool of co-investigators and data collectors for the agenda.

The survey results feed the prioritisation in three ways. First, practitioner-proposed research questions are added to the long list in Table 5.4. Second, the results inform two of the seven criteria (Section 2.6): problems that practitioners describe as rising count towards urgency, and practice gaps that no county study has addressed count towards the evidence gap. Third, the panel may use the results when agreeing criterion weights at the start of the scoring exercise.

2.5 Unit and Programme Heads' Research Gap Analysis

Unit, section and programme heads contributed through a structured Excel tool (Annex 7). Each head documented the current health gaps in their area, justified each gap with routine or survey data, described emerging trends, and proposed research questions. Thirteen submissions were received, one gap each, from: reproductive health; NCD services; oncology services; antimicrobial resistance; TB and lung health; HIV services; nutrition services; laboratory diagnostic services; health records and information; health informatics; quality improvement; public health and disease surveillance; and the Director of Health. Counselling services, ambulance and emergency services, and monitoring and evaluation did not submit.

Summary of submissions. The 13 gaps were submitted by 12 heads (one head covered both oncology and AMR). All 13 were rated high urgency. Eight gaps were backed by a quantitative indicator and five by a description of the problem; several figures have no source or year and need validation with the unit. Table 2.5 summarises the submissions by theme, and Annex 7 gives the evidence each unit proposed to synthesise and the actions it suggested.

Table 2.5: Priority gaps identified by units and programmes

Unit or section	Priority gap	Data justification (indicator, value, source, year)	Emerging trend	Proposed research question
Reproductive health (Theme 1)	Third-delay factors persistently contribute to maternal and perinatal deaths	73% of factors contributing to maternal deaths in FY2025/26 were third-delay factors	Focus on reducing maternal and neonatal deaths by strengthening MPDSR	Why do third delays persist despite repeated EmONC training and mentorship, and which health-system, facility, referral and decision-making factors affect timely definitive emergency care?

Unit or section	Priority gap	Data justification (indicator, value, source, year)	Emerging trend	Proposed research question
NCD services (Theme 2)	Most adults with hypertension or diabetes are undiagnosed, and many on treatment at Level 2–3 facilities are not controlled	Kenya STEPS 2015: hypertension 24.5%, 15.5% of hypertensives aware, 51.7% of those treated controlled; county diabetes prevalence 3.7% (Department of Health, 2024); county control figures to be added	Burden rising with ageing, urbanisation and diet change; SHA primary care financing, CHP blood pressure monitoring and digital NCD records are an opportunity	What proportion of adults screened by CHPs are linked to care and controlled within six months, and what explains drop-off at each step of the care cascade?
Oncology services (Theme 3)	Limited access to oncology services, from prevention and screening to diagnosis, treatment and referral	78% of patients present with late-stage disease (no source given); one oncology unit and two palliative care centres; limited knowledge of SHA and referral channels	Digitisation and SHA financing may support more patients; more screening will detect more cancers	What are the barriers to accessing oncology services in Makeni?
TB and lung health (Theme 4)	An estimated 54% of TB cases are not notified, increasing community transmission	2,086 cases notified in 2025 against an estimated 4,500 (46%)	Under-notification will persist to 2030 without diagnostic expansion, community engagement, sustainable financing and new technologies	Which strategies will most effectively close the TB notification gap, and how can they be scaled to reach at least 90% notification by 2030?
HIV services (Theme 4)	Low viral load suppression among children, adolescents and young people living with HIV	67% of people living with HIV have optimal viral load uptake (no source given)	Focus on optimising viral load uptake through counselling on appointment keeping	Which individual, caregiver and health-system factors influence viral load testing and suppression among children, adolescents and young people living with HIV?
Antimicrobial resistance	Limited knowledge of the AMR burden	Microbiology data from Makeni County Referral Hospital and	Unaddressed AMR will raise mortality and	What is the burden of AMR in Makeni

Unit or section	Priority gap	Data justification (indicator, value, source, year)	Emerging trend	Proposed research question
(Themes 4 and 9)	across human, animal and environmental health	agriculture department data (not quantified)	treatment costs and reduce animal productivity and household income	under a One Health approach?
Nutrition services (Theme 5)	Suboptimal infant and young child feeding practices	Children 6–23 months: minimum acceptable diet 26.6%, minimum dietary diversity 39.8%, egg or flesh food 22.7% (County Health and Nutrition Survey, 2023)	Expected to improve with community education and better food security	What factors influence infant and young child feeding practices?
Health records and information (Theme 8)	Low use of data by health service providers and managers	80% not aware of basic indicators (no source given)	Growing demand for evidence-based interventions by 2030	What factors influence the use of data in health service delivery?
Health informatics (Theme 8)	Little evidence on how digital health systems have affected quality of care	Tiberbu implemented in 241 facilities; effects on patient safety, timeliness, effectiveness and continuity of care not evaluated	Growing use of integrated digital records and clinical decision support	How has the implementation of digital health systems affected quality of care in county health facilities?
Laboratory diagnostic services (Theme 13)	Limited access to quality, timely and comprehensive diagnostics, especially at Level 2–3 facilities	Uneven infrastructure, equipment, staffing, reagents and specialised testing; reliance on referral laboratories and delayed results (not quantified)	Growing demand for decentralised, point-of-care, molecular and digital diagnostics with integrated specimen referral	What factors drive gaps in access to timely, quality laboratory diagnostics?
Director of Health (Theme 14)	Low individual staff productivity	Number of health workers more than doubled while workload stagnated (not quantified)	Shortages likely to grow with new facilities and staff specialisation	What is the individual productivity of health workers in Makuani?

Unit or section	Priority gap	Data justification (indicator, value, source, year)	Emerging trend	Proposed research question
Quality improvement (Theme 14)	Successful QI innovations are not systematically identified, documented, evaluated or scaled	Examples include Proximie remote surgical mentorship and Networks of Care (not quantified)	Digital knowledge management, data-driven QI, virtual mentorship and implementation science will drive the spread of effective practice	What factors influence the identification, documentation, adoption and scale-up of QI innovations, and what model can institutionalise scale-up?
Public health and disease surveillance (Theme 15)	Most villages have not attained open-defecation-free status	44% of villages certified open defecation free (Makueni County WASH Hub, 2026)	Community-led total sanitation to eliminate faeco-oral diseases	What factors contribute to open defecation in Makueni?

All 13 gaps were rated high urgency. Entries are summarised and lightly edited; Annex 7 gives the evidence to synthesise and suggested actions. Source: Unit and programme heads' research gap analysis tool, 2026.

What the submissions show. The submissions cover nine of the fifteen themes (1, 2, 3, 4, 5, 8, 13, 14 and 15), with three on communicable diseases and AMR. Most describe a cascade or service gap that programme data already show, such as TB notification, NCD control, viral load suppression or late cancer diagnosis, and so call for operational and implementation research rather than new burden studies. Several units asked first for existing data to be collated and synthesised, which suits the low-cost designs in Section 8.5.2.

Agreement with other sources. The submissions agree with the burden data (Chapter 3) and the practitioner survey (Section 2.4) on NCD control, maternal deaths, TB, AMR, laboratory access and nutrition. They add evidence not found elsewhere in this agenda: low use of data for decisions, the unevaluated roll-out of Tiberbu, unscaled QI innovations, open defecation, late-stage cancer presentation, and viral load gaps among children and young people.

Differences to resolve. Practitioners named understaffing as their most frequent problem (71%), while the Director of Health reports that staff numbers have more than doubled against a stagnant workload. Both may hold if staff are unevenly distributed across facilities and cadres, so workforce research should examine deployment, distribution and productivity together. Practitioners also raised rehabilitation and childhood disability, gum cutting and health-seeking behaviour, SHA financing, injuries and mental health, for which no unit submitted a gap.

Use in prioritisation. The proposed questions are added to Table 5.4. Because every gap was rated high urgency, the ratings could not distinguish between gaps, and the urgency criterion in Table 5.2 rests on routine data trends and practitioner reports. The submissions confirm, and do not change, the ratings in Table 5.2.

2.6 Research Prioritisation Method (CHNRI-Style Scoring)

The thematic and disease-level priority areas in Chapter 5 and Annex 2 are a long list. To move from a list to a ranked, defensible agenda that can be phased and resourced, the agenda adopts a scoring method adapted from the Child Health and Nutrition Research Initiative (CHNRI) [35,36]. CHNRI is a structured and widely used approach to research priority-setting. Because it separates individual scoring from group discussion, it reduces the risk that the most senior or most vocal person in the room decides the outcome.

2.6.1 Scoring panel, criteria and scale

The scoring panel includes the Research and Knowledge Management Coordinator, sub-county health management teams, programme leads and relevant research partners such as KEMRI and academic institutions. To make the panel balanced and to bring in the users of research, it also includes community and patient representatives, youth and gender representatives, independent academics and national-level members. All panellists sign a conflict-of-interest declaration before scoring, and partners declare any funding interest in the focus areas being scored.

Each panellist scores every research focus area against the seven criteria in Table 2.6, using a simple 0–1–2 scale. The criteria were agreed for the drafting workshop. They keep the core CHNRI criteria of burden, equity, feasibility and impact, and add the evidence gap, policy relevance against the six objectives of the Kenya Health Policy 2014–2030, and urgency. Table 2.6 also shows where in this agenda the evidence for each criterion is found. In the CHNRI method, scoring is individual and private, and focus areas are not debated to a single group score; Section 2.6.2 explains how this was applied for the present agenda.

Table 2.6: CHNRI-style prioritisation criteria

Criterion	Guiding question	Main evidence source in this agenda	Score (0, 1 or 2)
1. Disease burden	How large is the burden of death, illness and disability in Makueni, and how does it compare with national levels? Score from data, not perception alone.	KHIS morbidity and mortality (Sections 3.3–3.4); KDHS 2022; SMART 2023; burden signals (Table 7.5)	0 = low; 1 = moderate; 2 = high

Criterion	Guiding question	Main evidence source in this agenda	Score (0, 1 or 2)
2. Equity	Would the research mainly benefit underserved sub-counties, facility levels or groups, such as women, children, older people, people with disabilities or the poor? Define the priority group before scoring.	Population and survey indicators (Tables 3.1 and 3.5); sub-county data where available	0 = low; 1 = moderate; 2 = high
3. Feasibility	Can the research be done with a sound, ethical design within the agenda period, using budget, staff, partners and data that are available or can realistically be mobilised?	Existing activities, platforms and partners (Tables 7.2, 7.4 and 7.6)	0 = low; 1 = moderate; 2 = high
4. Evidence gap	How little county evidence exists? Is the question unanswered by completed or ongoing county work and by applicable national evidence?	Scoping review (Section 2.3); evidence map (Table 7.5); practice gaps reported by practitioners (Section 2.4)	0 = well covered; 1 = partly covered; 2 = little or no county evidence
5. Policy relevance	Does the research advance one of the six policy objectives of the Kenya Health Policy 2014–2030, and a current national strategy or CIDP 2023–2027 priority?	Alignment tables (Tables 4.2 and 4.3); CIDP 2023–2027	0 = not linked; 1 = linked to a policy objective; 2 = linked to a policy objective and a current strategy or county priority
6. Urgency	Is the problem worsening, newly emerging or tied to a reform now taking effect, so that delay would be costly?	KHIS trends (Tables 3.4 and 3.10); problems reported as rising (Section 2.4); urgency ratings from units (Section 2.5)	0 = stable or improving; 1 = persistent; 2 = worsening, emerging or reform-linked
7. Potential impact	If acted on, would the findings change a county policy, programme or budget decision and reduce a substantial share of the burden within the agenda period?	Theme justification (Table 5.1); existing decision platforms (Chapter 8)	0 = unlikely to change practice; 1 = possible; 2 = likely to inform a decision with large health gains

2.6.2 Scoring process used for this agenda

1. At the drafting workshop (Section 2.2), each research focus area from Chapter 5 and Annex 2 was rated against the seven criteria in Table 2.6 in thematic groups, and the ratings were agreed in plenary.
2. Independent, individual scoring by a panel was not conducted for this agenda. The ratings in Table 5.2 are therefore consensus ratings and should be read as a provisional ranking.
3. Independent scoring will be introduced in the first reprioritisation round under this agenda (Section 8.3). Each panellist will score every focus area privately on the form in

Annex 3 (Excel or KoboCollect), before any group discussion, and submit the scores to the Research and Knowledge Management Unit for aggregation.

2.6.3 Aggregation and ranking

- When independent scores are collected, the mean score for each criterion is calculated across panellists for each focus area. The seven criterion means are summed to give an overall priority score, with a maximum of 14 (seven criteria $\times$ 2). If the panel agrees criterion weights, the weighted sum is used and the weights are reported.
- Agreement between panellists is measured for each focus area using average expert agreement (AEA), which suits ordinal 0–2 scores better than the coefficient of variation. Low agreement on a highly ranked option is a signal for further discussion before resources are committed, not a reason to discard it.
- Focus areas are ranked by overall score to produce the draft ranking. This is expert judgement informed by data, not a substitute for data, and the ranking is not renegotiated in the room.

2.6.4 Validation of the ranking

The ranking of thematic areas (Table 5.2) was reviewed at the internal validation meeting (Section 2.7) by the departmental leadership, the county health management team, sub-county managers and facility in-charges from sub-county hospitals. Its purpose was to understand why the criteria produced the ranking and to decide whether to accept it or to adjust the criteria and re-score, not to renegotiate the ranking from scratch. This keeps broad stakeholder ownership without allowing the outcome to be captured by whoever argues most persuasively. Specific research questions will be scored independently by the panel in the first prioritisation round under this agenda (Section 8.3).

2.6.5 Use of the ranking

The validated ranking serves three purposes: it confirms or revises the provisional tiers in Section 5.2; it identifies the Tier 1 focus areas for which short research plans will be developed (Strategic Objective 8, Section 8.2); and it provides the basis for screening new research proposals and aligning them with county priorities. The exercise will be repeated as new evidence becomes available, as part of the periodic reprioritisation described in Section 8.3.

To support the panel, Table 5.2 provides an indicative rating of each thematic area against the seven criteria, drawing on the evidence in Chapters 3, 4 and 7, the practitioner survey (Section 2.4) and the unit and programme heads' gap analysis (Section 2.5). These ratings informed

discussion and validation and will be tested against the panel's independent scores in the first reprioritisation round (Section 8.3).

2.7 Validation of the Agenda

The draft agenda was validated before it was finalised for printing and dissemination. Validation aimed to test whether the priorities are practicable within the county's staff, systems and budget, to build consensus on the areas of focus, and to secure the goodwill of managers and health workers for the system strengthening needed to put the agenda into action.

Internal validation. A one-day validation meeting was held on 23rd October 2026 at the Maridell Hotel, Wote, Makueni. It brought together facility in-charges and facility representatives, sub-county medical officers of health, the CHMT and top departmental leadership.

Process. Validation followed four steps:

1. **Presentation of the draft:** the development process, evidence base, thematic areas, prioritisation matrix, governance structure and implementation framework.
2. **Group review:** participants reviewed the draft in groups against four questions. Do the priorities reflect the county's health needs and evidence gaps? Are they practicable with the county's staff, systems and budget? Are any priorities missing, duplicated or misplaced? Are the governance and implementation arrangements workable?
3. **Plenary discussion:** group findings were discussed to reach consensus; points of disagreement were recorded and resolved by the CHMT.
4. **Revision:** after the meeting, the drafting team revised the agenda to incorporate the feedback and insights received, and recorded every comment and how it was addressed in a validation matrix (Annex 10).

Peer review. In tandem with internal validation, academic partners, including Dr. Moses Mutua (Aga Khan University) and Dr. Joseph Kweri (JKUAT), together with Daystar University and the Directors of Health (Dr. Benard Kasanga, Dr. James Kanyange, Dr. Stephen Mwatha, Dr. Anthony Mathulu, Christopher Yulu and David Kiuluku), peer reviewed the draft for methodological rigour, clarity of the priorities, and alignment with national and global frameworks. The Ag. Director, Health Planning and Administration, Dr. Eric Chomba Wanjohi, undertook a final technical review of the revised draft.

Outcomes. The findings on the three aims of validation were:

- **Practicability:** participants confirmed the priorities and targets as practicable, and recommended that start-up actions planned over the first year be condensed into six months; the roadmap was revised accordingly, with an accountable office named for each strategic objective (Section 8.2).
- **Consensus on areas of focus:** participants endorsed the fifteen thematic areas and the priority questions. Injuries, violence, emergency and critical care moved to Tier 1, while antimicrobial resistance remained in Tier 1. Participants also asked that socio-cultural behaviours, attitudes and perceptions, from late care-seeking and defaulting to harmful practices and stigma, be studied explicitly; this was adopted as a cross-cutting research focus (Section 5.6). New questions on mental health among health workers and in the community, and on access to specialised clinics, were added (Table 5.4).
- **Goodwill for system strengthening:** departmental leaders made commitments on governance and administration (appointment of the research committees and the Unit), financing (a research budget line), a positive attitude to research across the Department, and protected staff working hours for research and evidence generation (Chapters 6 and 8).

What participants said. Most groups rated the priorities, governance arrangements, financing model and monitoring framework as sound and recommended that they be retained ("well done"; "reads well"; "no issues"). Their main concerns, and how the agenda responds, are summarised in Table 2.7. Two comments capture the spirit of the feedback:

"It is paramount to include cultural beliefs and norms, socio-behavioural [factors], attitudes and perspectives as an enablers aspect in the identified priorities." (Counselling Services Coordinator)

"If we carry out a study on antimicrobial use in, say, Mtito Andei hospital, how will the dissemination of the findings be done to participants in Mtito? ... Can we include an indicator on institution-specific dissemination?" (Director, Health Products and Technologies)

Table 2.7: Main concerns raised at validation and how they were addressed

No.	Concern	Raised by	Response	Section
1	Injuries, violence, emergency and critical care should be a Tier 1 theme.	Chief Officer, Health Human Resource Management and Administration; group review	Adopted. Theme 11 moved to Tier 1: injuries are the second most common condition among children under five, head injury is among the top ten admissions, and there is no county research on injuries or emergency care.	5.2; Table 5.2

No.	Concern	Raised by	Response	Section
2	Injuries could replace antimicrobial resistance (AMR) in Tier 1.	Chief Officer, Health Human Resource Management and Administration	Not adopted. AMR stays in Tier 1 (Theme 4): the National Action Plan on AMR 2023–2027 is in force [43], the county has an AMR focal person, unpublished point prevalence surveys provide a base to build on, and AMR remains a current concern. Tier 1 was expanded to six themes instead.	5.2
3	Move mental health to Tier 1, and study the factors behind mental health problems among health workers and in the community.	Nurse	Partly adopted. The question was added (Table 5.4). Mental health stays in Tier 2 because Tier 1 already has six themes, and it will be the first candidate for promotion in the 2026/27 prioritisation round.	5.2; Table 5.4
4	Include cultural beliefs and norms, socio-behavioural factors, attitudes and perspectives as enablers in the priorities.	Counselling Services Coordinator; plenary	Adopted as a cross-cutting research focus, with examples for each priority theme.	5.6; Table 5.6
5	Share findings of facility-based studies with the staff who took part, and add an indicator on institution-specific dissemination.	Director, Health Products and Technologies	Adopted. Findings are presented first at the participating facility through existing CME sessions; recommendations are tracked in the digital dashboard; two indicators and two no-cost activities were added.	6.5; 8.1; Table 9.1; Annex 8
6	The first year of the roadmap can be condensed to six months.	Group review	Adopted. Start-up actions were rescheduled to the first six months after launch.	Table 8.1
7	On specialised care, study the barriers patients face in referral to specialised clinics.	Group review	Adopted. Question added.	Table 5.4
8	Name the accountable office and supporting departments for each strategic objective.	Group review	Adopted.	Table 8.1
9	No budget is shown for each tier.	Group review	Partly adopted. Section 8.4 explains how each tier is funded; study budgets will be set in the Tier 1 research plans and annual work plans.	8.4

Earlier internal reviews of the draft had already led to the addition of food safety, chemical exposures and snakebite as emerging threats (Section 11.1); alignment of each thematic area with the Kenya Health Policy 2014–2030 objectives (Table 5.2); reference to national regulators by function rather than by name (Section 4.4); and the appointment and terms of reference of research committees (Section 6.3). The validated agenda, with the validation matrix, was submitted to the CECM, Health Services, for approval before dissemination (Section 8.1).

2.8 How the Evidence Streams Informed the Agenda

Each evidence stream answered a different question, and each was used for a specific part of the agenda (Table 2.8). The streams also checked one another: a theme was given priority when the burden data, the evidence map and the reports of practitioners and programme managers pointed the same way.

Table 2.8: How each evidence stream fed into the agenda

Evidence stream	What it contributed	Where it feeds into the agenda
Desk review of policies and laws (Section 2.2; Chapter 4)	Mandates, national and global priorities, and regulatory requirements	Policy relevance criterion; Kenya Health Policy alignment (Table 5.2); research approval and governance (Section 4.4; Chapter 6)
Scoping review of Makueni research (Section 2.3)	What has been studied, where evidence is thin, and recommendations not acted on	Evidence gap criterion; findings and evidence gaps (Section 3.7); evidence map (Section 7.4); baseline of the research inventory (Section 7.7)
Routine and survey data (Chapter 3)	Burden of disease, trends and inequities	Disease burden, equity and urgency criteria; justification of themes (Table 5.1); disease-level gaps (Annex 2)
Practitioner survey: closed questions (Section 2.4)	Priority areas and how often problems occur	Urgency ratings and the ordering of themes (Table 5.2)
Practitioner survey: open-ended answers (Section 2.4)	Why care fails, harmful practices, and practitioners' own research questions	Research questions (Table 5.4); Themes 1, 6 and 10; evidence gaps 7 to 9 (Section 3.7)
Unit and programme heads' gap analysis (Section 2.5)	Data-backed programme gaps, trends to 2030 and proposed questions	Research questions (Table 5.4); feasibility ratings; evidence to synthesise first (Annex 7)
Drafting workshop, validation and peer review (Sections 2.6 and 2.7)	Ranking, tiers, practicability and consensus	Tiers (Section 5.2); implementation roadmap (Chapter 8); governance (Chapter 6)

3. Situation Analysis

This chapter describes the context in which the agenda will be implemented: the county's geography and population, its health indicators and burden of disease, the Department of Health Services, and the strengths and weaknesses of the county research landscape. It ends with a summary of the main evidence gaps that the priorities in Chapter 5 address.

3.1 Geographic, Administrative and Demographic Context

Makueni County lies in the lower eastern region of Kenya, between latitude 1.8°S and longitude 37.6°E. It borders Machakos County to the north, Kitui County to the east, Taita Taveta County to the south and Kajiado County to the west. The county headquarters is at Wote, about 140 km from Nairobi. The county covers 8,176.7 km², of which 474.1 km² lies within Tsavo West National Park and 724.3 km² within the Chyulu Game Reserve [1].

The county has six sub-counties, which coincide with the parliamentary constituencies: Mbooni, Kaiti, Makueni, Kilome, Kibwezi West and Kibwezi East. These are divided into 30 wards (Mbooni 6, Kaiti 4, Makueni 7, Kilome 3, Kibwezi West 6 and Kibwezi East 4). The climate is mainly arid and semi-arid, with the Kilungu and Mbooni hills forming cooler, wetter highlands and the rest of the county consisting of expansive dry lowlands. Recurrent drought, water stress and climate variability affect livelihoods, nutrition and vulnerability to disease [1,2]. Agriculture is the main driver of the county economy, and the County Integrated Development Plan (CIDP) 2023–2027 emphasises agricultural value chains, irrigation and economic resilience [1].

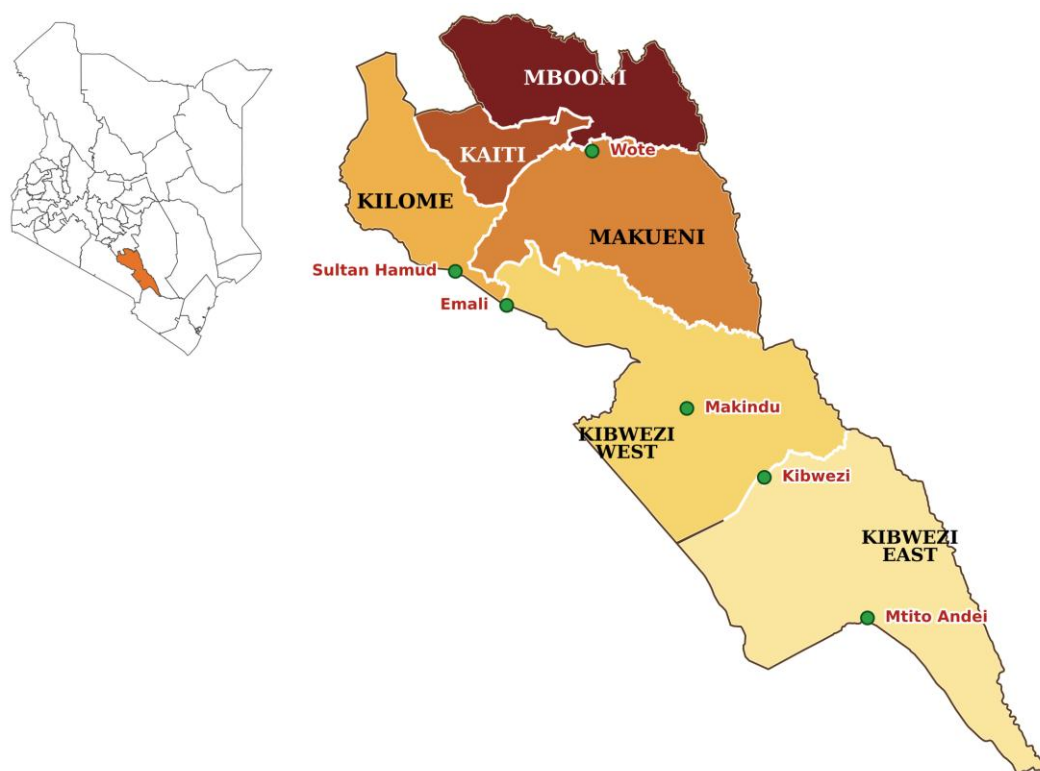


Figure 3.1: Makueni County sub-counties, main towns and location in Kenya

Source: sub-county (constituency) boundaries from the Independent Electoral and Boundaries Commission, drawn for this agenda; town locations approximate. Ward boundaries are not shown.

The 2019 Kenya Population and Housing Census recorded a population of 987,653, a density of about 121 persons per km² [53]. For service planning in 2026, KHIS uses a population of 1,152,802, distributed across sub-counties as shown in Table 3.2.

Table 3.1: Population planning denominators, 2026

Population group	Proportion (%)	Estimated number
Total population	100	1,152,802
Female	52	599,463
Male	48	553,350
Households (average household size 4.8)	–	238,950
Infants under 1 year (surviving infants)	2.2	25,648
Children under 5 years	12.7	146,614
Children aged 6–59 months	–	131,953

Population group	Proportion (%)	Estimated number
Population under 15 years	39.1	451,375
Young people aged 15–24 years	18.3	211,121
Women of reproductive age (15–49 years)	23.0	265,147
Estimated pregnant women	2.4	27,498
Estimated deliveries and live births	2.3	26,599
Neonates (0–28 days)	1.3	14,611
Estimated emergency obstetric complications	–	2,240
Adults aged 25–59 years	32.6	375,386
Older persons (60 years and over)	6.8	78,518
Girls aged 10–14 years	5.6	64,787
Girls aged 10 years (HPV vaccination cohort)	2.5	29,048
Women aged 40–74 years eligible for breast cancer screening	–	26,121
Women aged 25–49 years eligible for cervical cancer screening	–	20,112
Population aged 45–75 years eligible for colorectal cancer screening	–	179,845

Source: KHIS planning denominators, Department of Health Services, 2026 [52]. Household and target-group figures are KHIS planning denominators; some, such as the screening-eligible figures for breast and cervical cancer, are annual service targets rather than population counts.

Table 3.2: Population by sub-county, 2026

Sub-county	Population	Share of county (%)
Makueni	250,395	21.7
Mbooni	234,500	20.3
Kibwezi West	230,254	20.0
Kibwezi East	167,303	14.5
Kaiti	144,476	12.5
Kilome	125,874	10.9
Makueni County	1,152,802	100.0

Source: KHIS planning population, based on the 2019 Census [52,53].

Children under 15 make up almost two in five residents, and about one in fifteen is aged 60 or over. With declining fertility and improving survival, the share of older adults is expected to grow over the agenda period, increasing demand for NCD, geriatric, rehabilitative and palliative care, while maternal, newborn and child health needs remain substantial.

3.2 Health Facilities

The county has 361 health facilities. Two-thirds (67%) are owned by the county government, 24% are private, 7% are faith-based and 1% are run by non-governmental organisations (Table 3.3).

Table 3.3: Health facilities by level and ownership, 2026

Level	Public (county)	Private	FBO	NGO	Total
Level 5 (county referral hospital)	1	0	0	0	1
Level 4 (sub-county hospitals)	17	6	2	0	25
Level 3 (health centres)	45	19	2	0	66
Level 2 (dispensaries)	180	62	22	5	269
Total	243	87	26	5	361
Share (%)	67	24	7	1	100

Source: Department of Health Services. Reconcile with the Kenya Master Health Facility Registry (KMHFR).

3.3 Health Indicators of National and Global Focus

Makueni performs better than the national average on most maternal, child and reproductive health coverage indicators (Table 3.4). Coverage of four or more antenatal visits, early antenatal booking, family planning, treatment of diarrhoea with ORS and zinc, and maternal antiretroviral therapy all exceed national levels by wide margins, and completion of eight antenatal contacts has more than quadrupled since 2021/22.

Three trends, however, are of concern. First, the **facility neonatal death rate** has risen from 10.2 to 12.4 per 1,000 live births and is now above the national rate of 9.3. Second, the **facility maternal mortality ratio** has risen from a low of 51.4 per 100,000 deliveries in 2023/24 to 87.2 in 2025/26, although it remains below the national figure. Third, **first antenatal visit coverage** fell from almost 100% to 86%, and iron and folate supplementation from 99% to 92%, over the

same period. More than one in four new antenatal clients (28.4%) are anaemic. These are coverage-quality gaps: women and newborns are reaching services, but outcomes are not improving in step. They point to research on quality of care, emergency obstetric and newborn care, and the causes of newborn deaths.

Table 3.4: Selected health service indicators, Makueni and national, 2021/22–2025/26

Indicator	2021/22	2022/23	2023/24	2024/25	2025/26	National 2025/26	Makueni minus national	Change since 2021/22	Trend
4th ANC coverage (%)	69.1	69.8	71.9	66.0	69.0	48.4	+20.6	-0.1	Static
Pregnant women attending 1st ANC (%)	99.8	98.4	90.2	85.3	86.0	81.2	+4.8	-13.8	Worse
ANC clients receiving iron and folate (%)	98.6	99.8	97.4	96.0	91.9	73.4	+18.5	-6.7	Worse
Clients completing 8th ANC contact (%)	6.2	7.0	13.3	19.5	27.1	8.1	+19.0	+20.9	Better
1st ANC contact at ≤12 weeks (%)	20.0	23.9	30.2	31.5	34.9	19.8	+15.1	+14.9	Better
New ANC clients who are anaemic (%)	36.9	39.1	37.6	30.5	28.4	26.0	+2.4	-8.5	Better
Under-5 diarrhoea treated with ORS and zinc (%)	76.4	77.9	73.8	85.2	86.0	54.7	+31.3	+9.6	Better
Children 12–59 months dewormed (%)	68.6	89.7	54.7	59.3	69.0	49.2	+19.8	+0.4	Erratic
Women of reproductive age receiving FP commodities (%)	51.9	61.8	67.4	60.6	67.0	34.8	+32.2	+15.1	Better
Children under 1 fully immunised (%)	102.3	101.6	100.9	97.8	98.0	73.4	+24.6	-4.3	Static
Vitamin A coverage, 6–59 months (%)	78.3	78.6	72.8	75.8	77.4	79.5	-2.1	-0.9	Static
Facility maternal mortality ratio (per 100,000 deliveries)	99.6	70.8	51.4	78.7	87.2	95.5	-8.3	-12.4	Worse since 2023/24
Fresh stillbirth rate (per 1,000 births)	5.7	5.4	6.2	5.6	6.5	7.2	-0.7	+0.8	Slightly worse
HIV-positive pregnant women on maternal HAART (%)	84.2	98.4	97.3	96.0	100.0	49.3	+50.7	+15.8	Better
Facility neonatal death rate (per 1,000 live births)	9.3	11.3	10.4	12.4	10.1	10.1	+3.1	+2.2	Worse
Children under 5 who are stunted (%)	20.0	-	-	-	18.0	17.0	+1.0	-2.0	Better
Children under 5 who are underweight (%)	10.0	-	-	-	8.0	10.0	-2.0	-2.0	Better

Source: KHIS, Department of Health Services [52]; stunting and underweight are survey-based estimates. Differences are simple arithmetic differences; for mortality, stillbirth, anaemia, stunting and underweight a negative value is favourable. Immunisation coverage above 100% indicates an under-estimated population denominator.

Population surveys confirm this picture (Table 3.5). The 2022 KDHS found that 92% of births in Makueni were attended by a skilled provider and 82% of children aged 12–23 months were fully immunised [3], while the 2023 SMART survey documented inadequate dietary diversity among women of reproductive age, global acute malnutrition of 6.2% and stunting of 17.6% among children aged 6–59 months [4]. Only 46% of households have at least basic drinking water and 46% at least basic sanitation [5].

Table 3.5: Population survey indicators and implications for research

Area	Latest county evidence	Implication for the research agenda	Ref.
Maternal health	92% of births delivered by a skilled provider; 76% of women with a recent live birth had 4+ ANC visits (KDHS 2022).	Move beyond coverage to quality, timeliness, referral, emergency obstetric care and respectful care.	[3,4]
Child immunisation	82% of children 12–23 months fully immunised (KDHS 2022).	Sustain immunisation; identify zero-dose pockets, missed opportunities and outreach efficiency.	[3]
Nutrition	Global acute malnutrition 6.2% and stunting 17.6% among children 6–59 months; inadequate dietary diversity among women (SMART 2023).	Maternal nutrition, child wasting and stunting, food systems and climate-sensitive nutrition programming.	[4,16]
Water and sanitation	46% of households with at least basic drinking water and 46% with at least basic sanitation (KDHS 2022).	WASH–health linkages, diarrhoeal disease, IPC and climate resilience.	[5]
HIV	About 24,176 people living with HIV; adult prevalence about 3.2%.	Integrated HIV/TB/NCD care, adolescent and youth prevention, supply chain and viral suppression.	[6]
NCDs	Hypertension prevalence about 38% and high CVD risk about 26% in a household cardiometabolic survey.	PHC-integrated prevention, screening, adherence, commodity availability and care pathways.	[7,34]
Child mortality	County-level survey estimates of neonatal, infant and under-five mortality are not available from KDHS 2022; the facility neonatal death rate (Table 3.4) is the best routine proxy.	Link newborn deaths to quality of care, newborn services and nutrition.	[52]

3.4 Burden of Disease and Mortality

Makueni faces a double burden of disease: persistent communicable diseases and maternal and child health needs on one hand, and rising non-communicable diseases, cancers, mental health conditions and injuries on the other, set against climate-linked drought, food insecurity and water scarcity.

3.4.1 Outpatient morbidity

Upper respiratory tract infections are the leading outpatient condition in all age groups (Table 3.6). Among children under five, **injuries** are the second most common condition, followed by skin diseases and pneumonia. Among people aged five and over, **hypertension** is the second most common condition, followed by urinary tract infections, skin diseases and arthritis; diabetes ranks eighth.

Table 3.6: Top ten causes of outpatient morbidity, 2025/26

Rank	Under 5 years	Cases	Rank	5 years and over	Cases
1	Upper respiratory tract infections	126,863	1	Upper respiratory tract infections	276,016
2	Injuries	39,157	2	Hypertension	83,603
3	Diseases of the skin	23,966	3	Urinary tract infections	76,338
4	Pneumonia	12,319	4	Diseases of the skin	63,505
5	Tonsillitis	10,817	5	Arthritis and joint pains	60,866
6	Eye infections	9,255	6	Eye infections	33,420
7	Lower respiratory tract infections	9,082	7	Amoebiasis	31,908
8	Gastroenteritis	6,243	8	Diabetes	29,767
9	Amoebiasis	5,521	9	Diarrhoea	21,237
10	Intestinal worms	4,967	10	Pneumonia	19,703

Source: KHIS, 2025/26 [52].

The high number of under-five injuries (39,157 cases) and of urinary tract infections among older patients (76,338 cases) both stand out. Neither has any county research behind it (Chapter 7). The volume of urinary tract infections, which are frequently treated empirically, is directly relevant to antimicrobial resistance: a multi-county study that included a Makueni facility found that 66% of bacterial isolates from urinary tract infections were multidrug-resistant [30].

3.4.2 Inpatient morbidity and mortality

Among patients aged five and over, anaemia, hypertension, diabetes and pneumonia are the leading causes of admission (Table 3.7). Hypertension is the leading recorded cause of inpatient death, followed by anaemia, pneumonia, HIV and diabetes, with acute kidney failure and tuberculosis also among the top ten (Table 3.8).

Table 3.7: Top ten causes of inpatient morbidity, 5 years and over, 2025/26

Rank	Condition	Admissions
1	Anaemias or other erythrocyte disorders, unspecified	441
2	Essential hypertension, unspecified	416
3	Diabetes mellitus, type unspecified	291
4	Pneumonia, organism unspecified	278
5	Gastritis, unspecified	158
6	Bacterial cellulitis	117
7	Diabetes (separately coded)	114
8	Sepsis	98
9	Genitourinary tract infection in pregnancy	98
10	Head injury	90

Source: KHIS, 2025/26 [52]. Diabetes appears under two codes; combined (405 admissions) it would rank third. Confirm whether these figures cover all inpatient facilities or the county referral hospital only.

Table 3.8: Top ten causes of inpatient mortality, 5 years and over, 2025/26

Rank	Condition	Deaths
1	Essential hypertension, unspecified	153
2	Anaemias	64
3	Pneumonia, organism unspecified	57
4	Human immunodeficiency virus (HIV)	54
5	Diabetes mellitus	54
6	Acute kidney failure	42
7	Respiratory tuberculosis	32
8	Sepsis	20
9	Chronic obstructive pulmonary disease	19
10	Gastrointestinal ulcers	15

Source: KHIS, 2025/26 [52].

Set against admissions, these deaths imply very high case-fatality ratios: about 37% for hypertension, 21% for pneumonia and 13% for diabetes. Some of this probably reflects how causes of death are recorded (for example, stroke or heart failure coded as "essential hypertension") and differences in facility coverage between the admission and death data. The quality of cause-of-death coding is therefore itself a research and data priority, alongside the clinical question of why so many patients with cardiometabolic disease die in hospital.

Among children under five, deaths are dominated by **newborn conditions** (Table 3.9). Low birth weight, birth asphyxia (severe and other, 28 deaths combined), prematurity and neonatal meningitis account for 75 of the 109 deaths in the ten leading causes (69%). Pneumonia, sepsis and meningitis account for most of the rest.

Table 3.9: Leading causes of inpatient mortality, under 5 years, 2025/26

Rank	Condition	Deaths
1	Low birth weight	30
2	Severe birth asphyxia	19
3	Prematurity	12
4	Pneumonia	10
5	Sepsis	10
6	Infectious meningitis	9
7	Birth asphyxia	9
8	Gastroenteritis	5
9	Neonatal meningitis	5

Source: KHIS, 2025/26 [52]. Only nine causes were reported. Confirm whether "severe birth asphyxia" and "birth asphyxia" should be combined.

3.4.3 Trends in non-communicable diseases

Outpatient cases of hypertension fell by 13% between 2022/23 and 2025/26 but rose again in the last year, while diabetes cases rose by 15% over the same period (Table 3.10). Without population-based data it is not possible to tell whether these changes reflect real changes in disease, in screening and diagnosis, or in reporting. A household cardiometabolic survey and a partner baseline survey both found hypertension in about 38% of adults [7,34], far above the 25% found nationally in the 2015 STEPS survey [32]. This suggests that most cases are still undiagnosed or not reaching care.

Table 3.10: Outpatient cases of leading NCDs, 2022/23–2025/26

Condition	2022/23	2023/24	2024/25	2025/26	Change 2022/23 to 2025/26
Hypertension	96,010	82,513	76,952	83,603	–12.9%
Arthritis and joint pains	77,881	76,421	64,651	60,866	–21.8%
Diabetes	25,987	23,682	27,227	29,839	+14.8%

Source: KHIS [52]. The 2025/26 diabetes figure differs slightly from Table 3.6 (29,767); reconcile.

3.4.4 Priority burden areas

Drawing these data together with the public evidence summarised in Annex 2, the following areas carry the greatest burden in the county and guide the priorities in Chapter 5:

1. Hypertension, cardiovascular disease and diabetes, including kidney complications.
2. Newborn conditions: low birth weight, prematurity, birth asphyxia and neonatal sepsis.
3. Maternal conditions, including postpartum haemorrhage and anaemia in pregnancy.
4. Respiratory infections and pneumonia in all age groups.
5. Injuries, especially among children under five, and head injury.
6. Urinary tract and other bacterial infections, and the antimicrobial resistance associated with them.
7. HIV and tuberculosis.
8. Diarrhoeal diseases and other WASH-related conditions.
9. Malnutrition, anaemia and micronutrient deficiencies.
10. Cancers, especially breast, prostate and cervical cancer, and mental health and substance use disorders.

This list should be updated each year from KHIS, hospital mortality audits, MPDSR reviews and civil registration data. Annex 2 provides a more detailed, disease-level analysis of status, drivers, previous research and evidence gaps for 20 conditions.

3.5 The Department of Health Services

The Department of Health Services carries out the county health functions assigned under the Fourth Schedule of the Constitution of Kenya 2010, including county health facilities and pharmacies, ambulance services, the promotion of primary health care, licensing and control of

undertakings that sell food to the public, and cemeteries and related public health functions. The Constitution also guarantees every person the right to the highest attainable standard of health [8].

The Department provides promotive, preventive, curative, rehabilitative and palliative services through the county referral hospital, sub-county hospitals, health centres, dispensaries and community health units. Services include RMNCAH-N, communicable disease control (HIV, TB and malaria), NCD prevention and control, emergency care, surgery, laboratory and pharmaceutical services, mental health, rehabilitation, environmental health, community health, public health surveillance and health promotion. Reporting is automated through KHIS and the master facility list, and Makueni County Referral Hospital and Makindu Sub-County Hospital serve as teaching facilities for health records and information students [9].

The Department is led by the County Executive Committee Member (CECM) for Health Services and the Chief Officer(s), supported by the County Health Management Team (Table 3.11).

Table 3.11: Organisation of the Department of Health Services

Level	Structure
Policy and executive	CECM, Health Services; Chief Officer(s), Health Services
Management	County Health Management Team; Directors of Health Planning and Administration; Preventive and Promotive Health Services; Curative and Rehabilitative Health Services; Nursing, Health Products and Technologies and Monitoring and Evaluation
Programmes and units	Programme and service coordinators (HIV and STI, TB, NCDs, reproductive health, nutrition, laboratory, AMR and oncology, emergency and ambulance services, counselling, public health and surveillance, health informatics, health records) and the Research and Knowledge Management Unit
Service delivery	County referral hospital; sub-county hospitals; sub-county health management teams; health centres and dispensaries; community health units

3.6 SWOT Analysis of the County Research Landscape

A SWOT analysis was used to assess the internal strengths and weaknesses of the Department's research system and the external opportunities and threats that shape it. Strengths and weaknesses are factors within the Department's control; opportunities and threats arise from its environment. The analysis drew on the scoping review, the health practitioner survey, the unit and programme heads' gap analysis, the KM Priorities Mapping Survey and discussions of the technical working group (Chapter 2). It considered the four functions commonly used to assess health research systems: stewardship and governance, financing, creating and sustaining resources, and producing and using research [65,66]. For national context, Kenya scored 42% on

the African national health research systems barometer, placing it in the middle tier of African countries [65].

Makueni County has made important progress toward institutionalising research and knowledge management, but the research system is young and needs deliberate governance, financing, capacity building and partner coordination. The findings are summarised in Table 3.12 and inform the strategies in Section 8.2.

Table 3.12: SWOT analysis of the Makueni County health research landscape

Strengths (internal)	Weaknesses (internal)
• Leadership commitment to a county health research agenda and a research and knowledge management coordination framework, with a dedicated Research and Knowledge Management Unit • Signed and working MOUs and active partnerships with academic and research institutions, including KEMRI, JKUAT, Daystar University and Aga Khan University, which supported the development and peer review of this agenda • A budget line for knowledge sharing and staff engagement • Makueni County Referral Hospital and Makindu Sub-County Hospital designated as teaching facilities • Partner-supported studies under way, for example on surgical site infection and antimicrobial stewardship, and completed county studies such as the cardiometabolic survey • Well-established county initiatives that attract research interest, notably Makueni Care, the county's UHC scheme since October 2016 [15] • A growing CQI, data-use and dissemination culture • Existing digital knowledge-sharing platforms, including Umanyi, the county's online knowledge management platform, and the My Makueni app • Strong staff appetite for research: 96% of surveyed practitioners willing to take part, and 63% with prior research or QI experience • Routine platforms already in use (KHIS, eCHIS, MPDSR reviews, the hospital cancer registry)	• Weak research culture among many frontline teams • Limited internal capacity in protocol writing, data analysis and publication • Fragmented data systems and limited data quality assurance for research • No dedicated budget line for conducting research (the existing line covers knowledge sharing only) • Few research structures at facility and sub-county level • Under-use of existing collaboration opportunities • No county research policy or data-sharing guidelines • No protected research time or recognition for staff research • No established county health research committee or research ethics committee; members of research structures not yet appointed • Most completed county studies unpublished: only 2 of 18 county-anchored activities have a public report or publication • Low use of data for decisions (80% of providers and managers not aware of basic indicators, per the health records unit)

Opportunities (external)	Threats (external)
• A strong partner ecosystem, including KEMRI, KEMRI-Wellcome Trust Research Programme, KMTTC, the University of Nairobi, JKUAT, Daystar University, the University of Kabianga, the Open University of Kenya and UNICAF (Annex 9) • Growing demand for implementation research and local evidence, including on maternal, newborn and child health, NCDs, cancer and emerging and re-emerging diseases • Digital health, AI and telemedicine • The national Research for Health Policy Framework and research priorities [64] • The National Research Fund and international research funding calls • The annual county scientific conference as a platform for dissemination • Inter-county collaboration through the South Eastern Kenya Economic Bloc (SEKEB) • One Health integration through multisectoral collaboration • Accreditation by the national research regulatory body of the county research ethics committee to be established under this agenda • SHA, PHC and digital health reforms creating demand for local evidence on financing, primary health care and digital systems	• Research often driven by external priorities • Shifts in donor funding and global health financing, including the 2025 United States funding cuts that disrupted HIV services and surveillance in Kenya [68] • Political transitions and interference • Limited national guidance on the research role of counties • Health worker industrial action, turnover and migration • Delayed exchequer releases and SHA reimbursements • Data protection and cybersecurity risks as digital data grows • Emerging and re-emerging disease outbreaks • Changes in the names, mandates or procedures of national regulatory bodies (addressed by referring to them by function) • Emerging food safety and chemical exposure threats that outpace county surveillance capacity

Source: technical working group analysis of the inputs listed above, October 2026. Items are not ranked.

Several of these statements should be backed by figures as the research inventory is established. Table 3.13 sets out the baseline indicators the Department will report; they also serve as baselines for the monitoring framework in Chapter 9.

Table 3.13: Baseline indicators of the county research system

Indicator	Value	Source
Budget for research and knowledge management (KSh), and as a share of the county health budget, compared with the 2% benchmark of the Algiers Declaration [37]	To be established in 2027/28	County budget
Number of studies authorised by the county, 2023–2025, and the share led by county staff	To be established in 2026/27	Authorisation records; scoping review
Number of county-affiliated peer-reviewed publications, 2021–2025	To be established in 2026/27	Scoping review
Share of surveyed staff trained in protocol writing or data analysis	To be established in 2026/27	Training Needs Assessment; practitioner survey

3.6.1 Strategic implications (TOWS analysis)

A TOWS analysis [67] matches internal factors with external ones to identify strategies (Table 3.14). Each strategy is linked to the strategic objectives in Section 8.2.

Table 3.14: TOWS matrix: strategies arising from the SWOT analysis

Strength–Opportunity strategies (use strengths to take up opportunities)	Weakness–Opportunity strategies (use opportunities to overcome weaknesses)
- Use the MOUs, the teaching hospitals and Makueni's UHC profile to co-lead bids to the National Research Fund and international calls (Strategic Objectives 6 and 8). - Use the scientific conference, the Umanyi knowledge management platform and the My Makueni app to share findings with staff, partners and the public (Strategic Objectives 5 and 7).	- Adopt a county research and data-sharing policy aligned with the national Research for Health Policy Framework (Strategic Objective 10). - Draw on university and partner links for mentorship, biostatistics support and student co-supervision, and introduce protected research time and recognition in staff appraisal (Strategic Objectives 2 and 3). - Use SEKEB to share protocols and pool samples for joint studies (Strategic Objective 8). - Appoint the County Health Research Committee, the Research Ethics and Compliance Committee and sub-county and hospital research committees and seek accreditation of the ethics committee (Strategic Objective 1; Section 6.3).

Strength–Threat strategies (use strengths to counter threats)	Weakness–Threat strategies (minimise weaknesses and avoid threats)
• Use leadership commitment to secure a county budget line for conducting research, reducing dependence on external funding (Strategic Objective 9). • Require alignment checks and data-sharing, authorship and benefit-sharing agreements so that partner research serves county priorities (Strategic Objectives 1 and 10). • Build on existing digital platforms with data protection and cybersecurity safeguards (Strategic Objectives 4 and 10).	• Favour low-cost designs that use routine data, so that research continues under financing shocks (Section 8.5.2). • Build a network of research focal persons and documented SOPs to cushion staff turnover and industrial action (Strategic Objectives 1 and 3). • Keep rapid evidence capacity ready for outbreaks and other emergencies (Section 11.2).

Taken together, the SWOT analysis (Table 3.12) and the TOWS strategies (Table 3.14) show a county with strong leadership commitment, partnerships and visible health initiatives, but without the policy, budget, protected time and data systems needed to turn these into a steady flow of county-led research. The strategic objectives in Section 8.2 are designed to close these gaps while making the most of the national and partner opportunities identified here.

3.7 Scoping Review Findings and Key Evidence Gaps

Findings of the scoping review. The first round of the review (Section 2.3) identified 27 published studies and theses with Makueni-specific findings from 2015 to mid-2025 (Table 7.3), alongside 18 county-anchored activities (Table 7.2). The published evidence is thin and scattered: no theme has more than three studies. The largest clusters are maternal and newborn health, health financing and UHC, food safety (aflatoxin) and environmental health (fluoride and salinity in water), with two studies each on mental health, ageing and dementia, health products and One Health. No published study with Makueni-specific results was found on HIV, TB, malaria, the care of hypertension and diabetes, road traffic injuries, adolescent and reproductive health, or digital health, although these are among the county's leading causes of illness and death or its main investments (Chapter 3). These findings support gaps 2, 3, 5 and 10 below. They are provisional: 187 records still await screening by the review team (Table 2.3).

Taken together, the situation analysis, the scoping review, the mapping of existing research (Chapter 7) and the disease-level analysis (Annex 2) point to six main evidence gaps:

1. **Quality of maternal and newborn care.** Coverage is high, but neonatal deaths and facility maternal deaths are rising. Little county research explains why, and perinatal and maternal death reviews are not analysed systematically over time.
2. **Cardiometabolic disease.** Hypertension and diabetes are among the leading causes of illness, admission and death, and about 38% of adults have high blood pressure. Evidence is lacking on care cascades in Primary Care Networks, treatment continuity, in-hospital mortality and kidney complications.
3. **Injuries and emergency care.** Injuries are the second most common condition among children under five, and head injury is among the top ten admissions, but no county research on injuries, ambulance services or critical care was identified.
4. **Infections and antimicrobial resistance.** Urinary tract infections, pneumonia and sepsis are common and often treated without culture, while the only county AMR study remains unpublished.
5. **HIV, TB and the effect of reduced external financing.** HIV and TB are among the leading causes of adult inpatient death, yet county evidence on treatment outcomes and the effects of donor funding cuts is limited.
6. **Data quality and use.** Inconsistent denominators (immunisation above 100%), possible miscoding of causes of death and duplicate diagnostic codes limit the use of routine data for research and decisions.

The practitioner survey (Section 2.4) and the unit and programme heads' gap analysis (Section 2.5) confirm gaps 1, 2, 4, 5 and 6 from the front line and from programme data. Diabetes and hypertension were the conditions practitioners most often described as poorly managed (41%), and the NCD unit reports that most adults with hypertension or diabetes are undiagnosed or uncontrolled. The reproductive health unit attributes 73% of the factors contributing to maternal deaths in 2025/26 to third delays. Only 46% of estimated TB cases were notified in 2025, the HIV unit reports low viral load suppression among children and young people, the AMR unit reports little knowledge of the resistance burden, and the health records unit reports that 80% of providers and managers are not aware of basic indicators. The two sources also point to four gaps that routine data and published research do not show:

- 
7. **Harmful practices and health-seeking behaviour.** Late presentation (59% of respondents), defaulting (39%), infant gum cutting and herbal remedies (22% each) and beliefs that disability is a curse delay or undermine care. Gum cutting has been linked to over 30 child deaths in the county in 2023–2024 (Annex 2), yet no county study has measured its prevalence or drivers.
 8. **Health workforce and commodity security.** Staffing shortages (71%) and stock-outs of medicines, reagents and nutrition commodities (53%) are the most frequent recurring service problems practitioners report, but no county research has measured their effect on quality of care. The Director of Health reports that staff numbers have more than doubled while workload has stagnated, so the question is as much about deployment and productivity as about numbers.
 9. **Rehabilitation and childhood disability.** Practitioners report stroke, musculoskeletal conditions, cerebral palsy and autism as common or rising, with too few therapists, equipment and space, but there is no county evidence on their burden or on access to rehabilitation.
 10. **Learning from innovation.** Digital systems such as Tiberbu, now in 241 facilities, and quality improvement innovations such as Proximie and Networks of Care are in routine use, but their effects on quality of care have not been evaluated, and successful practices are not systematically documented or scaled.

Published Makueni studies identified during validation point to two further gaps:

11. **Food safety and chemical exposures.** Studies in the county have found aflatoxin in most maize-based foods tested and stored maize above the national limit [70–72], and there is growing concern about unsafe and unregulated farming and food production practices and exposure to harmful chemicals. No county study has measured pesticide residues or linked these exposures to liver cancer or other outcomes.
12. **Snakebite.** The only county study identified used hospital data from 2007–2009 and found antivenom given in about 6% of cases [73]. Current incidence, deaths, disability and antivenom availability are unknown.

4. Policy, Legal and Regulatory Framework

This chapter sets out the constitutional, legal, policy and technical frameworks that guide the agenda. Together they provide the basis for identifying research priorities, protecting research participants and health information, coordinating research and translating findings into better services. Laws establish obligations and mandates; policies and strategies provide direction; and technical guidelines and standards inform how research is designed and measured. The agenda does not create regulatory powers of its own, and it does not replace any existing legal requirement.

4.1 Policy and Legal Framework

4.1.1 Constitutional and legal foundations

The agenda is anchored in the Constitution of Kenya 2010. Article 43(1)(a) guarantees every person the right to the highest attainable standard of health, including health care services and reproductive health care, and the Fourth Schedule assigns county health functions to county governments [8]. Research supports the County in identifying service gaps, assessing whether interventions work and making evidence-informed decisions within this mandate. The principal legal instruments relevant to the agenda are listed in Table 4.1.

Table 4.1: Legal instruments relevant to the research agenda

Legal instrument	Relevance to the research agenda
Health Act, 2017 [54]	Provides the overarching health-sector framework, including provisions on health research, health information and national research coordination.
Science, Technology and Innovation Act, 2013, and the Science, Technology and Innovation (Research Licensing) Regulations, 2014 [55]	Provide the framework for research licensing, oversight and compliance through the national research regulatory body (currently NACOSTI).
Data Protection Act, 2019, and its regulations [56]	Govern the processing of personal data, including health information used in research.
Digital Health Act, 2023 [57]	Provides the legal framework for digital health systems, health information exchange and interoperability, and for research on digital service delivery.
Primary Health Care Act, 2023 [58]	Supports research on primary health care structures, community health services, coordination and referral.

Legal instrument	Relevance to the research agenda
Social Health Insurance Act, 2023, and its regulations [59]	Inform research on health financing, access, benefit use, claims and financial protection.
Facility Improvement Financing Act, 2023 [60]	Informs research on facility revenue, expenditure and accountability, and on the relationship between financing and service delivery.
Medical Laboratory Technicians and Technologists Act, 1999 [44]	Provides a regulatory reference for laboratory professional practice, laboratory inspection and the quality of diagnostic services.
Other health and professional legislation	Includes provisions on HIV confidentiality, cancer services, mental health, disability inclusion and clinical trials, according to the study concerned.

4.1.2 National policies, strategies and research frameworks

The agenda aligns with the **Kenya Health Policy 2014–2030**, particularly its emphasis on improving population health, equitable access, health system performance and collaboration with health-related sectors [10]. It also draws on the national research-for-health architecture: the Research for Health Policy Framework and national Research for Health Priorities issued by the Ministry of Health in 2019 [64], the national health research coordination arrangements established under the Health Act 2017, and programme research agendas such as the **National Reproductive Health Priority Research and Learning Agenda 2022–2027**.

The research priorities identified by departmental units link directly to national frameworks on data use, digital health and quality of care; TB detection and notification; maternal and perinatal emergency care; oncology and palliative care; antimicrobial resistance; laboratory diagnostics; and HIV treatment outcomes. These instruments and their county applications are mapped in Section 4.2.

National technical guidance on clinical care, referral, laboratory quality, infection prevention and control, monitoring and evaluation, and health information management informs the choice of study indicators and the interpretation of results. Surveys, routine information systems and implementation platforms, including the Kenya STEPS survey, KHIS and eCHIS, are treated as evidence sources or operational platforms, not as laws or policy frameworks. Where a national strategy ends before 2030, its successor applies once adopted, and the change is recorded during agenda reviews.

4.1.3 County planning and policy frameworks

The **Makueni County Integrated Development Plan 2023–2027** provides the county planning context for health services, knowledge management and sustainable development. It identifies the strengthening of knowledge management among the health sector's priorities, and its emphasis on a resilient economy is relevant to research on climate-sensitive health, WASH, food security and household vulnerability [1].

The agenda also aligns with the county's health sector strategic plan, Annual Development Plans, health work plans, the County Climate Change Action Plan 2023–2027 [2], the County Water and Sanitation Strategy and Investment Plan 2025–2030 [5], and approved policies and plans on laboratory services, antimicrobial resistance, food and nutrition, knowledge management and digital service delivery.

4.1.4 Research data governance and protection of participants

Research using patient records, HMIS data, laboratory information, claims records or linked datasets must follow the applicable ethics approvals, data protection requirements and access permissions. Protocols should define:

- the lawful basis and purpose of data processing;
- consent arrangements, or an ethics-approved waiver where applicable;
- the minimum data required;
- confidentiality safeguards and authorised users;
- secure storage and transfer, retention and disposal; and
- incident-response arrangements.

Data-sharing and data-use agreements should specify permitted uses, responsibilities, security measures and restrictions on onward sharing. Particular care is required for identifiable clinical records, HIV information, maternal and perinatal death review records, and research involving children or other participants who need additional protection. Access to identifiable records should be limited, and results should be reported in ways that minimise the risk of identifying individuals or small groups. Approval and access arrangements are set out in Section 4.4 and Annex 4.

4.2 Alignment with National and Global Health Priorities

Table 4.2 links the agenda's thematic areas (Section 5.1) to the relevant national and global frameworks and shows the evidence Makueni intends to contribute. Quality of care, equity, data use and implementation effectiveness are cross-cutting considerations for all themes.

Table 4.2: Alignment of research themes with national and global frameworks

Makueni research theme	Relevant national and global frameworks	Intended Makueni contribution to evidence
1. RMNCAH-N and quality of care	Kenya Health Policy 2014–2030; National Guidelines for Maternal and Perinatal Death Surveillance and Response 2024 [41]; National Reproductive Health Priority Research and Learning Agenda 2022–2027; EmONC and obstetric care guidelines; SDG 3.1 and 3.2	Evidence on third delays, facility readiness, timely emergency care, referral coordination, PPH interventions, training-to-practice gaps and implementation of MPDSR recommendations.
2. Non-communicable diseases and multimorbidity	National NCD strategy and clinical guidelines; Kenya Health Policy 2014–2030; WHO NCD commitments; SDG 3.4	PHC models for hypertension and diabetes management, treatment continuity, risk-factor reduction and HIV–NCD integration.
3. Cancer prevention and control	National Cancer Control Strategy 2023–2027 [38]; National Cervical Cancer Elimination Action Plan 2025–2030 [39]; SHA benefit provisions; WHO cervical cancer elimination strategy	Evidence on screening and diagnostic pathways, stage at diagnosis, access barriers, treatment completion, survivorship, palliative care and registry quality.
4. Communicable diseases, HIV, TB, malaria and AMR	National Strategic Plan for Tuberculosis, Leprosy and Lung Health 2023/24–2027/28 [40]; Kenya HIV Prevention and Treatment Guidelines 2022 and updates [42]; national malaria strategy; National Action Plan on Prevention and Containment of AMR 2023–2027 [43]; IPC and antimicrobial stewardship guidance	Evidence on TB detection and notification gaps, diagnostic and sample-referral access, HIV viral suppression and retention across age groups, treatment failure, AMR surveillance and prescribing practices.
5. Nutrition, food security and climate-sensitive health	National nutrition and food security policies and plans; county food and nutrition framework; County Climate Change Action Plan 2023–2027 [2]	Evidence on seasonal wasting and stunting, dietary diversity, household vulnerability and climate–nutrition–WASH links in a semi-arid setting.
6. Community health systems and PHC	Primary Health Care Act 2023 [58]; Kenya Community Health Policy 2020–	Evidence on CHP motivation, retention and supervision,

Makueni research theme	Relevant national and global frameworks	Intended Makueni contribution to evidence
	2030 [61]; community health strategy and referral guidance	community referral completion and community-to-facility links.
7. Health financing and UHC	Social Health Insurance Act 2023 [59]; Facility Improvement Financing Act 2023 [60]; Kenya UHC Policy 2020–2030 [62]	Evidence on financial protection, equity, SHA use and claims, facility financing and the effects of digital financial workflows on services.
8. Digital health, data science and AI	Digital Health Act 2023 [57]; Data Protection Act 2019 [56]; national health information and M&E frameworks; WHO Global Strategy on Digital Health 2020–2027 [48]	Evidence on how digital systems affect safety, timeliness, continuity and patient experience; data quality and use; interoperability; and well-governed AI use cases.
9. Public health emergencies, One Health and climate change	International Health Regulations (2005) and amendments; national One Health and emergency preparedness frameworks; climate and health strategies	Evidence on outbreak readiness, zoonoses, surveillance, drought-related health risks and coordinated response.
10. Mental health, substance use, disability and rehabilitation	Kenya Mental Health Policy 2015–2030 [63]; Mental Health (Amendment) Act 2022; substance use, disability and rehabilitation frameworks	Evidence on PHC-integrated mental health care, substance use, dementia, disability inclusion, rehabilitation access and functional outcomes.
11. Injuries, violence, emergency and critical care	Kenya Health Policy 2014–2030 (violence and injuries objective); emergency care, referral, road safety, occupational safety and GBV frameworks	Evidence on injury burden, trauma pathways, ambulance and pre-hospital care, emergency readiness, critical care and GBV response.
12. Specialised clinical, surgical and palliative care	National Cancer Control Strategy 2023–2027 [38]; national surgical, renal and palliative care guidance; SHA benefit provisions	Evidence on kidney care and dialysis, surgical safety and waiting times, and palliative and geriatric care.
13. Diagnostics, health products and technologies	Medical Laboratory Technicians and Technologists Act 1999 [44]; laboratory quality, biosafety and specimen-referral guidance; County Laboratory Services Strategic Plan; National Action Plan on AMR [43]	Evidence on diagnostic readiness, equipment and reagent availability, quality assurance, turnaround times, point-of-care testing, specimen referral and rational medicine use.
14. Health workforce, quality of care and patient safety	National Policy on Patient Safety, Health Worker Safety and Quality of Care 2022–2027 [45]; national human resources for health strategy	Evidence on staffing, workload, retention and burnout, patient safety incidents and patient experience.

Makueni research theme	Relevant national and global frameworks	Intended Makueni contribution to evidence
15. Environmental health, WASH and health promotion	County Water and Sanitation Strategy and Investment Plan 2025–2030 [5]; national environmental health, sanitation and health promotion frameworks	Evidence on water quality, sanitation, food safety, health care waste and effective behaviour change approaches.

4.3 Alignment with the Kenya Health Policy 2014–2030

The Kenya Health Policy 2014–2030 pursues its goal through six policy objectives and eight policy orientations [10]. Table 4.3 maps the agenda's themes to the six objectives; the eight orientations are addressed through the health systems research priorities in Section 5.5. Health information, quality of care, equity and implementation research support all six objectives.

Table 4.3: Alignment with the policy objectives of the Kenya Health Policy 2014–2030

Kenya Health Policy objective	Related Makueni research themes	Illustrative county research focus
1. Eliminate communicable conditions	1 RMNCAH-N; 4 Communicable diseases and AMR; 9 Public health emergencies and One Health; 13 Diagnostics	TB detection and notification; HIV viral suppression and retention; neonatal sepsis; diagnostic access; AMR; outbreak preparedness.
2. Halt and reverse the rising burden of non-communicable conditions	2 NCDs; 3 Cancer; 10 Mental health; 12 Specialised care	Hypertension and diabetes care cascades; in-hospital cardiometabolic mortality; cancer diagnosis and treatment completion; PHC-integrated mental health care and rehabilitation.
3. Reduce the burden of violence and injuries	11 Injuries, violence, emergency and critical care; 10 Rehabilitation	Childhood and road traffic injuries; head injury outcomes; GBV response; trauma care, ambulance and pre-hospital services; recovery and functional outcomes.
4. Provide essential health care	1 RMNCAH-N; 6 Community health and PHC; 7 Health financing; 8 Digital health; 13 Diagnostics; 14 Quality of care	Timely emergency obstetric and newborn care; essential diagnostics; referral completion; effects of digital systems on quality; equitable access to covered services.
5. Minimise exposure to health risk factors	2 NCD risk factors; 5 Nutrition; 10 Substance use; 15 Environmental health and WASH	Dietary diversity; behavioural risk factors; alcohol and substance use; WASH exposures; infection prevention.

Kenya Health Policy objective	Related Makueni research themes	Illustrative county research focus
6. Strengthen collaboration with health-related sectors	5 Nutrition and food security; 9 One Health and climate; 11 Injuries and violence; 15 WASH and health promotion	Agriculture–nutrition links (agriculture); water quality and WASH (water and environment); school health (education); zoonoses (livestock); road safety (transport); GBV response (gender and social protection).

Findings from Makueni may also be relevant to other counties, particularly in semi-arid settings, subject to assessment of contextual differences and transferability.

4.4 Research Regulation and Approval in Makueni

Research approvals serve different purposes. Ethics approval, national research licensing, regulatory authorisation, county administrative permission and facility or data access permission are distinct requirements, and none substitutes for another. The pathway for research in Makueni is as follows (see the flow chart in Annex 4):

In this agenda, "the national research regulatory body" means the body mandated to license research and accredit ethics committees, currently the National Commission for Science, Technology and Innovation (NACOSTI), and "the national medicines regulatory authority" means the body that authorises clinical trials, currently the Pharmacy and Poisons Board. These references remain valid if the bodies are renamed or restructured.

1. **Scientific and ethical review.** Research involving human participants or identifiable human data must be reviewed and approved by an Institutional Scientific and Ethics Review Committee (ISERC) accredited by the national research regulatory body. Consent, confidentiality, risks and additional protections are addressed in the protocol. Any waiver or exemption must be formally determined by the competent body.
2. **Research licensing.** Researchers obtain the required research licence from the national research regulatory body [46] and comply with its conditions, including notifying the County Governor and County Commissioner before starting.
3. **Additional regulatory authorisation.** Clinical trials must be authorised by the national medicines regulatory authority [47]. Studies involving specimen export, regulated technologies or other regulated activities obtain the relevant approvals.
4. **County registration and authorisation.** Researchers register the study with the Research and Knowledge Management Unit, which confirms the approvals above and issues county



authorisation to access county health services. The Unit coordinates and facilitates; it does not replace national regulators or accredited ethics committees. Once appointed, the County Health Research Ethics and Compliance Committee verifies these approvals (Section 6.3.2).

5. **Facility and data access.** Permission from the relevant facility and data custodian is obtained before accessing staff, records, systems or specimens, and a data-sharing agreement is signed where county data are used. Community entry is coordinated through appropriate local structures, which does not replace individual consent where it is required.
6. **Continuing oversight and sharing of findings.** Researchers comply with approval conditions and amendment and reporting requirements, and share findings with the County, the facilities involved and participating communities (Section 6.5).

Activities described as routine service evaluation, clinical audit, quality improvement or programme monitoring are assessed to determine which ethical and regulatory requirements apply. Where the classification is uncertain, investigators seek a formal determination from an accredited ISERC.

5. Priority Research Areas for 2026–2030

This chapter sets out what the county needs to know. Section 5.1 presents fifteen thematic areas, Section 5.2 groups them provisionally into tiers, Section 5.3 shows how every departmental unit is reflected in them, Section 5.4 lists illustrative priority questions for scoring, Section 5.5 sets out health systems research priorities, and Section 5.6 describes the cross-cutting methods that apply to all themes, including the study of socio-cultural behaviours, attitudes and perceptions. Annex 2 adds a disease-level analysis of 20 conditions.

The priorities are aligned with four reference points: the global health agenda, particularly Sustainable Development Goal 3 and World Health Organization strategies; national policy and guidelines, including the Kenya Health Policy 2014–2030, the Research for Health Policy Framework and national programme strategies (Chapter 4); the work and interests of strategic partners (Chapter 7); and the findings of research already conducted in and about Makueni (Sections 2.3 and 3.7).

5.1 Thematic Priority Areas

The thematic framework began with ten themes drawn from the county's burden of disease, national priorities and existing research. It was then reviewed against the six objectives and eight policy orientations of the Kenya Health Policy and against the work of every departmental unit and frontline cadre. That review found that hospital-based and specialised services, diagnostics, the health workforce, injuries and environmental health were missing or only partly covered, and five themes (11 to 15) were added. The fifteen themes are presented in Table 5.1.

Table 5.1: Thematic priority areas, justification and expected products

Thematic area	Justification	Illustrative research topics	Expected products
1. RMNCAH-N and quality of care	Coverage is high (69% four ANC visits; 98% full immunisation), but the facility neonatal death rate (12.4 per 1,000) is above the national rate and rising, the facility maternal mortality ratio has risen since 2023/24, and 28% of new ANC clients are anaemic. Newborn conditions cause 69% of under-five inpatient deaths.	PPH bundle; MMS; EmONC readiness; referral delays; birth asphyxia, prematurity and low birth weight; neonatal sepsis; KMC; ANC timeliness and anaemia; adolescent pregnancy; respectful maternity care.	Policy briefs; CQI projects; MPDSR trend analyses; conference abstracts; MNH implementation manuscripts.

Thematic area	Justification	Illustrative research topics	Expected products
2. Non-communicable diseases and multimorbidity	Hypertension is the second most common outpatient condition (83,603 cases) and the leading recorded cause of adult inpatient death; diabetes cases rose 15% in three years; about 38% of adults have hypertension.	Hypertension and diabetes care cascades; CVD risk stratification; in-hospital cardiometabolic mortality; commodity availability; lifestyle interventions; PCN NCD clinics; NCD-HIV integration.	NCD dashboard; PCN model evaluation; manuscript on the cardiometabolic survey; commodity forecasting brief.
3. Cancer prevention and control	Breast (555), prostate (479) and cervical (210) cancers dominate the 2024 hospital cancer registry; KEMRI-county work shows concerning HPV trends. Cervical cancer is preventable when vaccination, screening and treatment pathways function. Aflatoxin, a known liver carcinogen, has been found in maize and maize-based foods in the county [70–72].	HPV prevalence; screening uptake and HPV self-sampling; screen-and-treat completion; diagnosis delay and stage at diagnosis; referral pathways; aflatoxin and hepatitis B in liver cancer; palliative care.	Registry strengthening; screening QI; policy brief on cervical cancer elimination targets.
4. Communicable diseases, HIV, TB, malaria and AMR	HIV and TB are among the top seven causes of adult inpatient death; urinary tract infections (76,338) are the third most common outpatient condition, and 66% of isolates in a multi-county study were multidrug-resistant. HIV programmes face reduced external funding.	HIV viral suppression and retention; TB case finding and TPT; HIV/TB/NCD integration; AMR surveillance and antibiograms; antimicrobial stewardship; malaria micro-stratification; IPC adherence.	Integrated HIV/TB/NCD dashboard; AMR and IPC reports; stewardship interventions.
5. Nutrition, food security and climate-sensitive health	SMART 2023 found GAM of 6.2% and stunting of 17.6%, with poor dietary diversity among women; anaemia is the leading cause of adult admission; drought is recurrent.	Drivers of stunting and wasting; maternal dietary diversity and micronutrients; food insecurity; drought–health links; WASH–nutrition integration.	SMART survey products; climate–health briefs; nutrition CQI projects.
6. Community health systems and PHC	Community Health Promoters (CHPs) are central to PHC, demand creation, surveillance and referral under the PHC Act 2023, and eCHIS is newly rolled out.	CHP motivation, retention and supervision; CHUSLA and financial empowerment; eCHIS use and data quality; referral completion; community scorecards; PCN functionality.	CHP model evaluation; implementation briefs; improved community indicator tracking.

Thematic area	Justification	Illustrative research topics	Expected products
7. Health financing and UHC	Makueni is a nationally visible UHC county; the transition to SHA and Facility Improvement Financing changes facility revenue, claims and household protection.	Makueni Care lessons; effects of the SHA transition; facility financing; strategic purchasing; claims management; out-of-pocket expenditure; equity.	Financing policy briefs; annual UHC learning forum; grant proposals.
8. Digital health, data science and AI	KHIS, eCHIS and several digital tools (PROMPTS, Proximie) are in routine use, but none has been evaluated in the county; routine data show denominator and coding problems.	Data quality and interoperability; dashboards and data use; evaluation of digital tools; telemedicine; AI-supported analytics; privacy and digital literacy.	County health data repository; live dashboards; data-use case studies; digital tool evaluations.
9. Public health emergencies, One Health and climate change	Zoonotic risks near wildlife areas, WASH vulnerabilities and climate variability require integrated preparedness evidence.	Outbreak preparedness and EOC workflows; zoonoses; rabies PEP access; drought and nutrition surveillance; heat and vector risks.	After-action reviews; One Health dashboard; simulation exercise reports.
10. Mental health, substance use, disability and rehabilitation	Over 49% of residents reported alcohol or substance use in 2023 and 11.8% were alcohol-dependent; departmental data show elevated suicidal behaviour; published county studies exist on mental health systems and dementia screening.	Integration into PHC; community mental health; substance use interventions; suicide prevention; dementia; disability-inclusive services; stigma.	Mental health integration plan; evaluation of community screening; abstracts and manuscripts.
11. Injuries, violence, emergency and critical care	Injuries are the second most common condition among children under five (39,157 cases), head injury is among the top ten adult admissions, and the only county injury study is a hospital-based study of snakebite, which found an incidence of 5.4 per 100,000 a year and antivenom given in about 6% of cases (2007–2009 data) [73].	Childhood and road traffic injuries; occupational injuries; GBV; snakebite and poisoning; ambulance and pre-hospital care; emergency departments; ICU and high-dependency care.	Injury surveillance reports; ambulance response audits; ICU outcome analyses.
12. Specialised clinical, surgical and palliative care	Acute kidney failure is the sixth leading cause of adult inpatient death; surgical, oncology, renal and palliative services are expanding with an ageing population.	Chronic kidney disease and dialysis; surgical and anaesthesia safety and waiting times; oncology treatment; palliative and	Renal and surgical registries; surgical safety audits; palliative care needs assessment.

Thematic area	Justification	Illustrative research topics	Expected products
		end-of-life care; geriatric care; rehabilitation.	
13. Diagnostics, health products and technologies	Many common infections are treated without culture; laboratory capacity, turnaround time and commodity security limit care and research.	Laboratory quality and turnaround times; radiology and imaging; blood transfusion; pharmaceutical supply; rational medicine use and prescribing; pharmacovigilance.	Laboratory capacity assessments; prescribing audits; supply chain briefs.
14. Health workforce, quality of care and patient safety	Quality of care, staffing and patient safety underlie the coverage-quality gap seen across services; burnout and turnover affect all cadres.	Staffing against norms; workload, retention and burnout; occupational health and safety; patient safety incidents; patient experience.	Workforce studies; patient safety reports; patient experience surveys.
15. Environmental health, WASH and health promotion	Only 46% of households have basic drinking water and 46% basic sanitation; published studies show health risks from salinity and fluoride in water. Aflatoxin was found in 85% of maize-based foods eaten by lactating mothers, and 24–68% of stored maize samples, by area, exceeded the national limit [70–72]; no county study has measured pesticide residues or exposure.	Water quality, sanitation and hygiene; food safety, including aflatoxin and other mycotoxins, pesticide and agrochemical residues and heavy metals; health care waste; air quality; health promotion and behaviour change; school health.	Water quality and WASH studies; evaluations of health promotion approaches.

Sources: Chapter 3, Annex 2 and references [3–7,13,28,30,34,52].

5.2 Prioritisation Matrix and Provisional Tiering

Not all fifteen themes can be funded equally, so they are prioritised and mapped on several factors. Table 5.2 rates each theme against the seven prioritisation criteria (Section 2.6) and shows its provisional tier and the Kenya Health Policy 2014–2030 objectives it mainly serves (Table 4.3). The ratings apply the scoring guidance in Table 2.6 to the evidence in this agenda:

- **Disease burden** from the burden signals in Table 7.5 (high 2, moderate 1; system themes 1).
- **Equity** 2 where the main beneficiaries are women, children, people with disabilities, rural households or the poor.

- **Feasibility** 2 where an existing activity, platform or partner can host the research (Table 7.6), 1 otherwise.
- **Evidence gap** from the coverage ratings in Table 7.5 (strong 0, moderate 1, limited or none 2).
- **Policy relevance** 2 where Table 4.2 names a current national strategy or county plan for the theme, 1 where only general frameworks apply.
- **Urgency** 2 where routine data show a worsening trend, practitioners report a rising problem, a reform is taking effect now (SHA, the PHC Act, the Digital Health Act, reduced external financing), or Chapter 11 identifies an emerging threat; 1 where the problem is persistent.
- **Potential impact** 2 where findings could change a county decision affecting a leading cause of illness or death, or the financing of services; 1 otherwise.

The ratings are consensus ratings from the drafting workshop and will be tested through independent scoring in the first reprioritisation round (Section 8.3). Any theme may change tier where the scoring or new data justify it.

Table 5.2: Prioritisation matrix and provisional tiering of thematic areas

Thematic area	C1	C2	C3	C4	C5	C6	C7	Total (of 14)	KHP pillar	Tier
1. RMNCAH-N and quality of care	2	2	2	0	2	2	2	12	1, 4	Tier 1
2. NCDs and multimorbidity	2	1	2	1	2	2	2	12	2, 5	Tier 1
3. Cancer prevention and control	2	2	2	2	2	2	2	14	2	Tier 1
4. Communicable diseases, HIV, TB, malaria and AMR	2	1	1	2	2	2	2	12	1	Tier 1
5. Nutrition, food security and climate-sensitive health	1	2	2	1	2	1	1	10	5, 6	Tier 2
6. Community health systems and PHC	1	2	2	2	2	2	1	12	4	Tier 2
7. Health financing and UHC	1	2	2	0	2	2	2	11	4	Tier 1
8. Digital health, data science and AI	1	1	2	2	2	2	1	11	4	Enable r

Thematic area	C1	C2	C3	C4	C5	C6	C7	Total (of 14)	KHP pillar	Tier
9. Public health emergencies, One Health and climate change	1	1	1	2	2	1	1	9	1, 6	Tier 2
10. Mental health, substance use, disability and rehabilitation	2	2	1	1	2	2	1	11	2, 3, 5	Tier 2
11. Injuries, violence, emergency and critical care	2	2	1	2	1	1	2	11	3, 6	Tier 1
12. Specialised clinical, surgical and palliative care	2	1	1	2	2	2	1	11	2	Tier 2
13. Diagnostics, health products and technologies	1	1	1	2	2	1	1	9	1, 4	Enable r
14. Health workforce, quality of care and patient safety	1	1	1	2	2	1	1	9	4	Enable r
15. Environmental health, WASH and health promotion	1	2	1	1	2	2	1	10	5, 6	Tier 2

Scores: 0 = low, 1 = moderate, 2 = high; for evidence gap, 2 = little or no county evidence. Totals are unweighted sums. Ratings are compiled from the evidence in Chapters 3, 4 and 7 and Sections 2.4 and 2.5, to be tested through independent scoring in the first reprioritisation round (Sections 2.6 and 8.3).

Criteria (Table 2.6): C1 disease burden; C2 equity; C3 feasibility; C4 evidence gap; C5 policy relevance; C6 urgency; C7 potential impact. KHP objective = Kenya Health Policy 2014–2030 policy objective (pillar) the theme mainly serves (Table 4.3): 1 eliminate communicable conditions; 2 halt and reverse the rising burden of non-communicable conditions and mental disorders; 3 reduce the burden of violence and injuries; 4 provide essential health care; 5 minimise exposure to health risk factors; 6 strengthen collaboration with private and other health-related sectors.

- **Tier 1: flagship (Themes 1, 2, 3, 4, 7 and 11).** These have the largest documented burden or most adverse trends (newborn deaths, hypertension, AMR, childhood injuries), direct relevance to national reforms (SHA, cervical cancer elimination, the AMR action plan), and existing data and partners that make studies answerable within the agenda period. All six rate 11 or more. Theme 11 was moved from Tier 2 at validation (Section 2.7).
- **Tier 2 (Themes 5, 6, 9, 10, 12 and 15).** These have important burden, equity or system relevance, and are pursued through targeted studies, embedded quality improvement and partner-led work.

- **Cross-cutting enablers (Themes 8, 13 and 14).** These support all tiers through data quality, diagnostics, commodities and the workforce. Their questions are embedded in Tier 1 and Tier 2 studies and in the health systems priorities (Section 5.5). AI and data governance research is subject to the Digital Health Act 2023 and the Data Protection Act 2019. A further enabler, added at validation, is the study of the socio-cultural beliefs, behaviours, attitudes and perceptions of communities, patients and health workers, which applies to every theme (Section 5.6 and Table 5.6).

The ratings broadly support the provisional tiers: Tier 1 themes rate 11 to 14, Tier 2 themes 9 to 12 and the enablers 9 to 11. Four points informed the validation discussion and will guide the next prioritisation round:

1. **Community health and PHC (Theme 6) rates 12**, as high as most Tier 1 themes, because county evidence is limited while the PHC Act and the eCHIS roll-out are changing community services now. It is a candidate for promotion to Tier 1.
2. **Themes 10, 11 and 12 rate 11**, level with Theme 7. Theme 11 (injuries and emergency care) combines a high burden with little county evidence and was moved to Tier 1 at validation. Theme 10 (mental health) was also proposed for promotion and will be considered first in the 2026/27 prioritisation round.
3. **RMNCAH-N and health financing (Themes 1 and 7) rate 0 on evidence gap** because existing county work in these areas is strong overall. Specific gaps remain, notably the causes of the rise in neonatal deaths (Section 3.7).
4. **The problems practitioners raise most often, staffing and stock-outs**, fall under enabler Themes 13 and 14, which rate lower because their burden is indirect. They are best addressed through the health systems priorities (Section 5.5) and by embedding workforce and commodity questions in Tier 1 studies.

Each Tier 1 area will be developed into a short research plan setting out key questions, study designs, lead institutions, timeline and budget (Strategic Objective 8, Section 8.2).

5.3 Mapping of Departmental Units to Themes

Every unit and section should find its work reflected in at least one theme (Table 5.3).

Table 5.3: Departmental units and their primary themes

Unit or section	Primary theme(s)
Reproductive health services	1 RMNCAH-N and quality of care
HIV and STI services; TB programme	4 Communicable diseases, HIV, TB, malaria and AMR
NCD services	2 NCDs and multimorbidity; 12 Specialised care
AMR and oncology services	3 Cancer; 4 AMR; 12 Specialised care
Nutrition	5 Nutrition, food security and climate-sensitive health
Community health services	6 Community health systems and PHC
Counselling services	10 Mental health, substance use, disability and rehabilitation; 11 Violence (GBV)
Ambulance and emergency services	11 Injuries, violence, emergency and critical care
Laboratory services; pharmacy	13 Diagnostics, health products and technologies
Public health, environment and disease surveillance	9 Public health emergencies and One Health; 15 Environmental health, WASH and health promotion
Health informatics; health records and information; M&E	8 Digital health, data science and AI
Preventive and promotive health services	1, 4, 5, 6, 15
Curative and rehabilitative health services	2, 3, 10, 11, 12, 14
Health planning and administration	7 Health financing and UHC; 14 Health workforce; Section 5.5 health systems priorities

5.4 Priority Research Questions by Theme

Table 5.4 sets out an initial long list of priority research questions, drawn from the situation analysis, Annex 2, the mapping in Chapter 7 and departmental submissions. The questions illustrate the research focus areas scored under Section 2.6. Questions proposed in the practitioner survey (Section 2.4) and in the unit and programme heads' gap analysis (Section 2.5), and at the validation meeting (Section 2.7), are included, and marked "practitioner survey", "unit heads" or "validation" in the research type column. After scoring, the list will be reduced to the five to ten highest-ranked questions per theme, with their scores and ranks. Scores and ranks will be published after the first prioritisation workshop in 2026/27 (Annex 8, objective 1).

Table 5.4: Long list of priority research questions for scoring

Theme	Priority research question	Research type	Annex 2 link
1. RMNCAH-N	What are the causes and avoidable factors of the rise in facility neonatal deaths since 2021/22, by facility and sub-county?	Epidemiological; audit	Item 2
1. RMNCAH-N	What is the effect of the AMPLI-PPH study on PPH-related maternal deaths and severe morbidity in Makeni facilities?	Implementation research	Item 1
1. RMNCAH-N	What explains the fall in first-ANC coverage and iron-folate supplementation, and the persistence of anaemia in pregnancy?	Operational research	Item 1
1. RMNCAH-N	How ready are Level 3 and Level 4 facilities to provide newborn resuscitation, KMC and management of neonatal sepsis?	Health systems	Items 2, 6
1. RMNCAH-N	What drives the practice of infant gum cutting, and how does it contribute to neonatal sepsis, acute kidney injury and death?	Mixed methods (practitioner survey)	Items 6, 15
1. RMNCAH-N	What are the barriers and enablers to exclusive breastfeeding in the county?	Qualitative; cross-sectional (practitioner survey)	Item 16
1. RMNCAH-N	Why do third delays persist despite repeated EmONC training and mentorship, and which health-system, facility, referral and decision-making factors affect timely definitive emergency care?	Mixed methods; implementation research (unit heads)	Items 1, 2
2. NCDs	What proportion of adults with hypertension and diabetes are diagnosed, treated and controlled, and where are they lost in the care cascade within PCNs?	Epidemiological; cascade analysis	Item 10
2. NCDs	Why do so many patients admitted with hypertension and diabetes die in hospital, and how accurately are their causes of death recorded?	Clinical audit	Item 10
2. NCDs	Does task-sharing of hypertension care with nurses and CHPs improve blood pressure control at PHC level?	Implementation research	Item 10
2. NCDs	Which patient and service factors explain poor blood pressure and glucose control, and defaulting, among patients on NCD follow-up?	Mixed methods (practitioner survey)	Item 10
2. NCDs	What proportion of adults screened for hypertension and diabetes by CHPs are linked to care and controlled within six months, and what explains drop-off at each step?	Cohort; cascade analysis (unit heads)	Item 10

Theme	Priority research question	Research type	Annex 2 link
3. Cancer	What proportion of women screened positive for HPV or precancerous lesions complete treatment, and what causes drop-out?	Cascade analysis	Item 12
3. Cancer	What are the stage at diagnosis and the delays to diagnosis and treatment for breast and prostate cancer?	Registry-based study	Item 12
3. Cancer	Does HPV self-sampling increase cervical cancer screening coverage among women in rural sub-counties?	Implementation research	Item 12
3. Cancer	What are the barriers to accessing oncology services, from screening to diagnosis, treatment and referral, and why do 78% of patients present at a late stage?	Mixed methods (unit heads)	Item 12
3. Cancer	How much do dietary aflatoxin exposure and hepatitis B infection contribute to liver cancer in Makueni?	Case-control; registry-based	Items 12, 19
4. Communicable diseases and AMR	What are the pathogens and resistance patterns of urinary tract infections and neonatal sepsis in county facilities?	Laboratory surveillance	Items 6, 8
4. Communicable diseases and AMR	How have reductions in external HIV financing affected viral suppression, retention and commodity availability?	Health systems; cohort	Item 3
4. Communicable diseases and AMR	What is the yield of targeted TB case finding among people with diabetes, HIV and malnutrition?	Operational research	Item 4
4. Communicable diseases and AMR	What is the burden of AMR in human, animal and environmental samples in Makueni (One Health)?	Surveillance; One Health (unit heads)	Item 8
4. Communicable diseases and AMR	Which individual, caregiver and health-system factors influence viral load testing and suppression among children, adolescents and young people living with HIV?	Mixed methods (unit heads)	Item 3
4. Communicable diseases and AMR	Which strategies will most effectively close the TB notification gap (46% of estimated cases notified in 2025) and reach at least 90% notification by 2030?	Operational research (unit heads)	Item 4

Theme	Priority research question	Research type	Annex 2 link
5. Nutrition	What seasonal and household factors drive wasting and stunting, and how do they relate to drought cycles?	Epidemiological	Item 16
5. Nutrition	What is the cost and effect on anaemia of county-wide MMS scale-up in antenatal care?	Implementation; costing	Items 1, 16
5. Nutrition	What factors influence infant and young child feeding practices among children aged 6–23 months?	Cross-sectional; qualitative (unit heads)	Item 16
6. Community health	What is the effect of CHP financial empowerment (CHUSLA) and performance-based financing on CHP retention and community indicators?	Programme evaluation	–
6. Community health	How complete and accurate are eCHIS data, and what proportion of community referrals are completed?	Data quality; operational	–
6. Community health	What drives late presentation for care, and which community health interventions shorten delays in care seeking?	Mixed methods; implementation research (practitioner survey)	–
7. Health financing	What has been the effect of the SHA transition and Facility Improvement Financing on facility revenue, service use and out-of-pocket spending?	Health systems; policy evaluation	Item 13
7. Health financing	What lessons from MakueniCare can inform equitable benefit design and enrolment under SHA?	Policy analysis	Item 13
7. Health financing	Which services, including rehabilitation, fall outside SHA cover, and how do waivers and unpaid bills affect access and facility revenue?	Health systems; policy analysis (practitioner survey)	Item 13
8. Digital health	What are the effects of PROMPTS on ANC and postnatal attendance, danger-sign reporting and equity, and at what cost?	Evaluation; cost-effectiveness	–
8. Digital health	What are the main sources of error in KHIS denominators and cause-of-death coding, and how can they be corrected?	Data quality	–
8. Digital health	How has the roll-out of digital health systems (Tiberbu) affected patient safety, timeliness and continuity of care across facility levels?	Comparative evaluation (unit heads)	–
8. Digital health	What factors influence the use of data for decision-making by health workers and managers?	Mixed methods (unit heads)	–

Theme	Priority research question	Research type	Annex 2 link
9. Emergencies and One Health	How prepared are county facilities and the emergency operations centre to detect and respond to outbreaks and zoonoses?	Health systems; simulation	–
9. Emergencies and One Health	Which drought and climate indicators predict malnutrition and disease surges early enough to act?	Ecological; modelling	Item 16
10. Mental health	What is the coverage and effect of PHC-level screening and brief interventions for depression and harmful alcohol use?	Implementation research	Item 11
10. Mental health	What are the patterns and risk factors of suicidal behaviour among adults and adolescents in the county?	Epidemiological	Item 11
10. Mental health	What is the burden of childhood disability (cerebral palsy, autism) and stroke, and what share of patients reach rehabilitation services?	Epidemiological; service assessment (practitioner survey)	–
10. Mental health	What factors contribute to mental health problems among health workers and in the community, and what helps to prevent them?	Mixed methods (validation)	–
11. Injuries and emergency care	What are the causes, settings and outcomes of injuries among children under five?	Epidemiological; surveillance	Item 17
11. Injuries and emergency care	What are ambulance response times and outcomes of emergency referrals, and what drives delays?	Operational research	Item 17
11. Injuries and emergency care	What predicts mortality and length of stay among patients in the ICU and high-dependency units?	Clinical cohort	–
11. Injuries and emergency care	What are the incidence and outcomes of snakebite, how quickly do patients reach care, and is antivenom available at Level 2–4 facilities?	Epidemiological; health systems	Item 20
12. Specialised care	What is the burden and cost of dialysis, and what predicts late referral of patients with kidney disease?	Clinical; costing	Item 18
12. Specialised care	What are surgical waiting times and safety outcomes, including surgical site infection after caesarean section?	Clinical audit	Item 9
12. Specialised care	What are the palliative care needs of patients with advanced cancer and other chronic illness, and how well are they met?	Needs assessment	Item 12

Theme	Priority research question	Research type	Annex 2 link
12. Specialised care	What explains rising lower-limb amputations at the county referral hospital?	Clinical audit; case-control (practitioner survey)	Items 9, 10
12. Specialised care	What barriers do patients face in reaching specialised clinics, and how well do referrals from lower-level facilities get them there?	Mixed methods; health systems (validation)	–
13. Diagnostics	How do laboratory turnaround times and reagent stock-outs affect clinical decisions?	Health systems	Item 8
13. Diagnostics	What are antibiotic prescribing patterns at each facility level, and how do they compare with national guidelines?	Prescribing audit	Items 7, 8
13. Diagnostics	What causes recurrent stock-outs of medicines, reagents and nutrition commodities, and how do they affect care?	Health systems (practitioner survey)	Item 14
13. Diagnostics	What factors drive gaps in access to timely, quality laboratory diagnostics at Level 2 and 3 facilities?	Health systems (unit heads)	Item 8
14. Workforce and quality	What are the levels and drivers of burnout and turnover among nurses and clinicians?	Cross-sectional; qualitative	Item 14
14. Workforce and quality	Which patient safety incidents are most frequent, and what system factors contribute to them?	Incident analysis	–
14. Workforce and quality	How do staffing shortages affect quality of care, waiting times and patient outcomes?	Health systems; mixed methods (practitioner survey)	Item 14
14. Workforce and quality	What factors influence the documentation, adoption and scale-up of QI innovations, and what model can institutionalise scale-up?	Implementation research (unit heads)	–
14. Workforce and quality	What is the individual productivity of health workers, and how do deployment and distribution explain reported shortages?	Workforce audit (unit heads)	Item 14
15. Environmental health	How do water salinity and fluoride levels relate to dental, skeletal and other health outcomes in affected wards?	Epidemiological	–
15. Environmental health	Which health promotion approaches change hygiene, nutrition and screening behaviour in Makueni communities?	Evaluation	–

Theme	Priority research question	Research type	Annex 2 link
15. Environmental health	What factors contribute to open defecation in villages not yet certified open defecation free?	Mixed methods (unit heads)	–
15. Environmental health	Which pesticides and other agrochemicals are used in Makueni farming, how safely are they handled, and what residues are found in locally sold produce?	Cross-sectional; laboratory analysis	Item 19
15. Environmental health	What is the level of aflatoxin exposure among women and young children, and which drying and storage practices reduce it?	Biomarker survey; intervention study	Item 19

5.5 Health Systems Research Priorities

Health systems research is organised around the eight policy orientations of the Kenya Health Policy 2014–2030 [10]. Some orientations correspond directly to themes in Section 5.1; Table 5.5 sets out priority research areas for all eight, for validation through the CHNRI-style scoring.

Table 5.5: Health systems research priorities by Kenya Health Policy orientation

Policy orientation	Priority research areas for Makueni	Link to county plans and themes
1. Organisation of service delivery	Referral system performance; functionality of Primary Care Networks; effectiveness of CQI initiatives; patient experience and respectful care	Themes 1, 6, 14; PHC Act 2023
2. Leadership and governance	Functionality of county, hospital and facility management structures; implementation of county health policies and laws; social accountability; partner coordination	Departmental strategic plan; Chapter 6
3. Health workforce	Staffing against norms and distribution; retention, motivation and burnout; task-sharing and mentorship models; the CHP workforce	Themes 6, 14; Training Needs Assessment
4. Health financing	Effects of the SHA transition and Facility Improvement Financing on facilities and households; out-of-pocket expenditure; efficiency and strategic purchasing	Theme 7
5. Health products and technologies	Commodity availability and stock-outs; laboratory turnaround time, quality and capacity; antimicrobial stewardship; pharmacovigilance	Theme 13; County Laboratory Services Strategic Plan; county AMR action plan

Policy orientation	Priority research areas for Makueni	Link to county plans and themes
6. Health information	Data quality and use of KHIS and eCHIS; denominators and cause-of-death coding; interoperability; dashboards for decision-making; data protection	Theme 8; Digital Health Act 2023
7. Health infrastructure	Equipment availability, maintenance and use; facility readiness for the essential benefit package; ambulance and emergency transport; climate resilience of facilities	Themes 9, 11; Annual Development Plan; CIDP 2023–2027
8. Research and development	Research capacity of county staff; uptake of evidence into policy and budgets; effectiveness of the county research governance arrangements and repository	This agenda; Chapters 6 and 7

5.6 Crosscutting Methods and Enablers

Socio-cultural behaviours, attitudes and perceptions. The validation meeting (Section 2.7) identified socio-cultural behaviours, attitudes and perceptions as key drivers of the problems behind the prioritised themes. The practitioner survey supports this: 59% of practitioners reported late presentation for care, 39% defaulting, 22% infant gum cutting, 22% the use of herbal remedies, and 20% myths and cultural or religious beliefs that delay or undermine care (Section 2.4). Research under every theme will therefore examine the behaviours, attitudes and perceptions of communities, patients and health workers, using qualitative, mixed-methods and community-based participatory designs. Table 5.6 shows how this applies to the priority themes.

Table 5.6: Socio-cultural behaviours, attitudes and perceptions as drivers of the priority themes

Theme	Behaviours, attitudes and perceptions to study	Example research question
Cancer prevention and control	Fear and fatalism about cancer; stigma; use of herbal remedies and traditional healers before hospital care; men's attitudes to their partners' screening	What beliefs and care-seeking pathways explain why 78% of cancer patients present at a late stage?
RMNCAH-N and quality of care	Late antenatal booking; preference for home delivery; infant gum cutting; beliefs about breastfeeding and child feeding; norms on adolescent sexuality	How do family and community norms influence the timing of antenatal booking and the place of delivery?
NCDs and multimorbidity	Perceptions of hypertension and diabetes as curable or episodic; use of	How do patients' beliefs about hypertension and diabetes affect

Theme	Behaviours, attitudes and perceptions to study	Example research question
	herbal remedies; diet, alcohol and tobacco norms	treatment adherence and defaulting?
HIV, TB, malaria and AMR	Stigma and non-disclosure; self-medication; expectation of antibiotics	How do stigma and self-medication with antibiotics affect TB case finding and antibiotic use in the community?
Health financing and UHC	Trust in SHA; perceived value of insurance; willingness to pay	What shapes household decisions to enrol, and stay enrolled, in SHA?
Community health and PHC	Trust in community health promoters and facilities; preference for traditional healers	Which community norms delay care-seeking, and which approaches by community health promoters change them?
Mental health, disability and rehabilitation	Beliefs that disability is a curse or a consequence of abortion; stigma of mental illness; norms on substance use	How do beliefs about disability and mental illness affect care for children with disabilities and for people with mental illness?

The following approaches apply to research under all themes:

- **Socio-cultural lens:** every study considers the behaviours, attitudes and perceptions that shape the problem it addresses (Table 5.6).
- **Equity analysis:** disaggregation of results by sex, age, disability and sub-county, and geospatial analysis to identify underserved areas.
- **Implementation research embedded in services,** so that studies answer the questions managers face and their results can be acted on directly.
- **Strengthening routine data,** including KHIS, eCHIS, registries and MPDSR, so that they can be used for research.
- **Community engagement:** meaningful involvement of communities, patients, youth and CHPs in setting questions, conducting research and sharing results.
- **Ethics, data governance and open access:** compliance with Chapter 4, and deposit of protocols, reports and dataset metadata in the county repository.

6. Research Governance, Coordination and Partnerships

6.1 Mandate of the Research and Knowledge Management Unit

The County Health Research and Knowledge Management Unit coordinates health research governance, evidence generation, knowledge translation, research capacity building, partner alignment, data-to-action processes and scientific dissemination for the Department of Health Services.

The Unit is anchored in the Directorate of Health Planning and Administration and is headed by the Research and Knowledge Management Coordinator, who also chairs the County Health Research Committee. The Unit is the secretariat of the research committees and the Advisory Forum described in Section 6.3.

6.2 Terms of Reference of the Research and Knowledge Management Unit

The Unit shall:

- A. Coordinate the development, implementation and periodic review of the County Health Research Agenda.
- B. Maintain a county inventory of ongoing, completed and proposed research involving county health facilities, staff, data or communities (Section 7.7).
- C. Register and track research requests, and issue county authorisation once the researcher holds approval from an accredited ethics review committee and a research licence from the national research regulatory body and has met Data Protection Act requirements. The Unit coordinates and facilitates; it does not replace national ethics review or licensing (Section 4.4).
- D. Provide technical support to health workers and managers in proposal development, operational research, implementation science, data analysis, abstract writing and manuscript preparation.
- E. Coordinate the establishment of research focal persons and mentorship structures in hospitals and sub-counties.
- F. Maintain a county health research and data repository containing protocols, approvals, tools, dataset metadata, reports, abstracts, publications and policy briefs, subject to data protection requirements.

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- G. Support the translation of evidence into CQI, policy briefs, departmental circulars, programme decisions and resource mobilisation.
 - H. Coordinate annual or biennial county health scientific conferences, dissemination forums and learning exchanges.
 - I. Promote research ethics, responsible data sharing, authorship integrity and community engagement in research.
 - J. Support partnership development, grant identification and collaborative research agreements with academic, research, implementing and development partners.
 - K. Track research outputs, publications, conference presentations, policy uptake and the implementation of recommendations.
 - L. Coordinate the periodic CHNRI-style prioritisation exercise (Section 2.6), including facilitator training, administration of independent scoring and the validation workshop.
 - M. Maintain a county policy on research data ownership, data sharing, authorship and benefit sharing for partner-led studies, with written agreements in place before data collection begins.
 - N. Require declarations of conflicts of interest from scoring panel members, advisory forum members and research partners, particularly for industry-sponsored research.
 - O. Report quarterly to the Director, Health Planning and Administration, and periodically to the CHMT and departmental leadership.
 - P. Serve as secretariat to the County Health Research Committee, the County Health Research Ethics and Compliance Committee and the County Health Research Advisory Forum: prepare agendas and papers, keep minutes and records, and follow up decisions.
 - Q. Support sub-county and hospital research committees with tools, standard operating procedures, training and quarterly review.
 - R. Prepare and update standard operating procedures for study registration, county authorisation, data access, monitoring of approved studies, and handling of complaints, adverse events and protocol deviations.
 - S. Prepare an annual research and knowledge management work plan and budget aligned with the departmental Annual Work Plan and, through it, the county Annual Development Plan, and an annual report on implementation of the agenda (Chapter 9).

- T. Keep records of committee appointments, terms of office, conflict-of-interest and confidentiality declarations, and training of members.
- U. Mobilise grants and funding for research, including collaborative micro-grants that help staff start small priority studies with academic partners.

6.3 Research Governance Structure

The structure builds on the organogram proposed by the CHMT. At the time of writing, the county has no established research committee or research ethics committee. Through this agenda, the Chief Officer, Health Human Resource Management and Administration, appoints the members of every committee and forum in Figure 6.1 in writing (Section 6.3.5 and Section 8.2). Until these appointments are made, the Research and Knowledge Management Unit performs the coordination functions in Section 6.2.

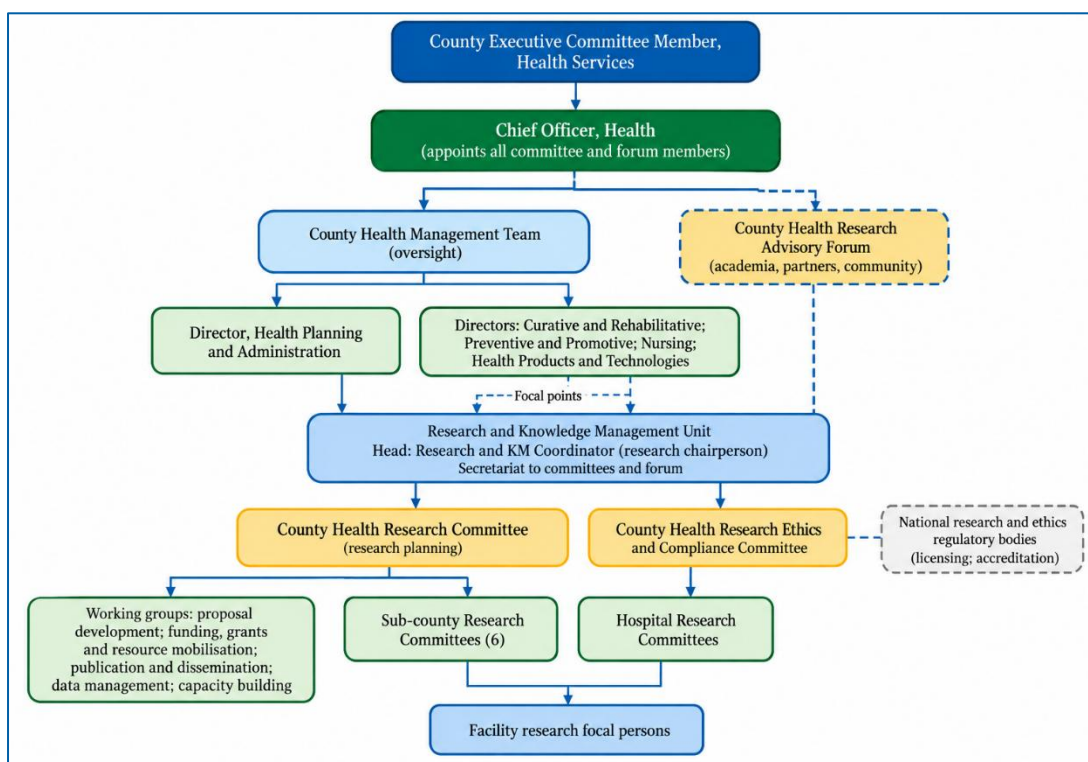


Figure 6.1: Proposed research governance structure of the Department of Health Services

Solid lines show reporting relationships; dashed lines show advisory, technical or external links. Based on the organogram proposed by the CHMT, 2026. CHMT: County Health Management Team, comprising the directors of health and the county programme coordinators.



The Unit reports to the Director, Health Planning and Administration. It works alongside the health information, ICT and data analytics lead, and through research focal persons in programmes, hospitals and sub-counties. The County Health Research Advisory Forum brings together academia, research institutions, implementing partners, community representatives and programme leads to advise on priorities, partner alignment and resource mobilisation.

6.3.1 County Health Research Committee

The County Health Research Committee (the research planning committee in the proposed organogram) plans, coordinates and oversees health research in the Department and ensures that research follows this agenda.

- **Chair and secretary:** chaired by the Research and Knowledge Management Coordinator; an officer of the Unit is secretary.
- **Membership:** 13 members: the chair and secretary; one representative of each directorate (curative and rehabilitative, preventive and promotive, nursing, health products and technologies, and health planning and administration); the county health records and information coordinator; the monitoring and evaluation lead; a representative of the county referral hospital; two sub-county medical officers of health, on rotation; and one representative of a partner academic institution or KMTC.
- **Functions:** review the agenda annually and recommend priority studies, including Tier 1 research plans; review research requests for alignment with the agenda and county feasibility before county authorisation; oversee working groups on proposal development, funding, grants and resource mobilisation, publication and dissemination, data management and capacity building; guide sub-county and hospital research committees; organise the county scientific conference and reprioritisation exercises; and track the indicators in Chapter 9.
- **Meetings and reporting:** meets monthly, with special meetings as needed; quorum is half of the members plus one; reports to the Chief Officer, Health Human Resource Management and Administration, through the Director, Health Planning and Administration.

6.3.2 County Health Research Ethics and Compliance Committee

The County Health Research Ethics and Compliance Committee protects the dignity, rights, safety and well-being of research participants and the confidentiality of county data, and fosters research that benefits the community. It works in two phases.

- **Guiding principles:** respect for persons, beneficence, justice and fairness, a favourable balance of risk and benefit, and voluntary informed consent, applied in line with national guidelines for the ethical conduct of research involving human participants.
- **Phase 1, compliance (from appointment):** verifies ethics approval, research licence, data-sharing agreement and data protection compliance before county authorisation; monitors the progress of approved studies, including site visits, for continued compliance with approved ethical standards; reviews reports of unanticipated problems, adverse events, protocol deviations, possible non-compliance and complaints, and refers them to the approving ethics committee and the national research regulatory body; advises whether audits, QI projects and service evaluations need ethics review (Section 4.4); and trains staff in research ethics and Good Clinical Practice.
- **Phase 2, ethics review (after accreditation):** once accredited as an ISERC by the national research regulatory body, provides independent, competent and timely scientific and ethics review of protocols before they start; decides whether studies are acceptable on ethical grounds; reviews the adequacy of consent documents and the balance of risks and benefits; and considers fairness across groups by age, sex, disability, economic status and culture. Until accredited, it does not approve research involving human participants.
- **Register:** keeps a register of research involving human participants in county facilities, linked to the research inventory (Section 7.7), and shares information with the national research regulatory body on request.
- **Membership:** 13 members, appointed by the Chief Officer, Health Human Resource Management and Administration, in line with the NACOSTI guidelines for accreditation of institutional scientific and ethics review committees, which require at least seven members and, if more, an odd number [88]. It includes a chair with training or experience in research ethics and leadership; a vice-chair elected by members at the first meeting; at least five members with research expertise and experience; at least one member with current experience in clinical care or counselling; at least one member with knowledge of Kenyan law; at least one technical member from outside the Department; and at least one lay member, not employed by the Department, to represent the community. At least one third of the members are of either gender. The chair is independent of research sponsors.
- **Meetings:** monthly, subject to workload. The quorum is at least half of the members, and a lay member must be present at every meeting; for clinical research, at least two members present are clinicians, one of them in active practice or clinical research [88].

- **Conflicts of interest:** a member with any financial or other interest in a matter declares it before the matter is considered, leaves the meeting while it is discussed, and does not vote on it. The declaration and absence are recorded in the minutes.
- **Reporting:** reports to the Chief Officer, Health Human Resource Management and Administration, and, once accredited, to the national research regulatory body. The Unit is secretariat.

6.3.3 Sub-county and Hospital Research Committees

Sub-county research committees, one in each of the six sub-counties, and hospital research committees bring research structures to the facility level.

- **Membership:** chaired by the sub-county medical officer of health or the hospital medical superintendent, or a nominee; the research focal person is secretary; members represent nursing, clinical, laboratory, pharmacy and health records staff, and, for sub-counties, community health services.
- **Functions:** identify local research and QI questions; support approved studies and data access at facility level; mentor staff in proposal and abstract writing; keep a register of local studies and report it to the Unit each quarter; and share findings with facilities and communities.
- **Meetings and reporting:** meet quarterly and report to the County Health Research Committee through the Unit.

6.3.4 County Health Research Advisory Forum

- **Membership:** academic and research institutions (including KEMRI, JKUAT, Daystar University, Aga Khan University and KMTC), development and implementing partners, community and patient representatives, the private sector and county programme leads; chaired by the Chief Officer, Health Human Resource Management and Administration, or a nominee.
- **Functions:** advise on priorities and reprioritisation; promote alignment of partner research with the agenda; support joint grant applications and resource mobilisation; and provide peer review and mentorship.
- **Meetings:** twice a year.

6.3.5 Appointment and Tenure of Members

- The Chief Officer, Health Human Resource Management and Administration, appoints the chair and members of each committee and the Advisory Forum in writing, on the recommendation of the CHMT, within three months of approval of this agenda (Section 8.2).
- Members serve for three years, renewable once. Terms are staggered so that no more than half of the members change at once.
- Members sign conflict-of-interest and confidentiality declarations on appointment. At every meeting, a member with an interest in a matter declares it, withdraws while it is considered and does not vote; this is recorded in the minutes.
- Members receive orientation in research governance and ethics within one month of appointment.
- The Chief Officer may replace a member who misses three consecutive meetings without apology or breaches confidentiality.
- Each committee adopts its terms of reference at its first meeting and reviews them every two years.

6.4 Roles of Stakeholders

Table 6.1: Roles of stakeholders in implementing the agenda

Stakeholder	Role
County Executive (CECM and Chief Officers, Health Services)	Provide policy leadership; approve the agenda; champion the agenda with partners.
CHMT and departmental directorates	Own the priorities; allocate budget for research and knowledge management; integrate research findings into annual work plans, budgets and programme reviews; release staff for research.
Research and Knowledge Management Unit	Coordinate implementation, the research inventory and repository, county authorisation, capacity building, dissemination and monitoring (Section 6.2).
Hospitals, sub-county teams and research focal persons	Generate operational and CQI-linked research; support approved studies; feed findings back to services.
County Health Research Advisory Forum	Provide technical advice; review priorities; support partner alignment and resource mobilisation.
KEMRI, universities and colleges	Provide technical guidance and mentorship; co-lead priority studies; host and co-supervise student research aligned to the agenda.

Stakeholder	Role
Development and implementing partners	Align funded research with county priorities; co-fund studies; sign data-sharing and benefit-sharing agreements; share findings and data with the county.
National research, ethics and medicines regulatory bodies; accredited ISERCs	License and approve research; monitor compliance with ethical and regulatory requirements.
County Assembly (Health Committee)	Support budget allocation for health research and oversee implementation of the agenda.
Communities, CHPs and facility committees	Take part in setting questions, conducting and disseminating research; hold researchers accountable for feeding back results.

6.5 Obligations of Researchers Working in Makueni

Persons and institutions conducting health research in Makueni County are expected to:

- align proposed research with the priorities in this agenda, or explain the county relevance of research outside it;
- register the study with the Research and Knowledge Management Unit and obtain county authorisation after ISERC approval and licensing by the national research regulatory body;
- comply with the Data Protection Act 2019, and sign data-sharing, authorship and benefit-sharing agreements before data collection begins;
- involve county staff in study teams where feasible, and acknowledge the county in all outputs;
- share reports, dataset metadata and publications with the county repository; and
- present findings to the Department of Health Services, to the facilities involved and to participating communities; within participating facilities, findings are first presented to staff through existing continuing medical education (CME) sessions (Section 8.1).

7. Mapping of Key Research, Implementation Science and Evidence Activities

Before the agenda can direct new research, the county needs a clear picture of the research, implementation science and evidence work already under way or recently completed. This chapter maps that work: what is being done, by whom, at what stage, and how its results are being used. It then compares the existing evidence with the county's burden of disease.

The mapping serves three purposes. First, it prevents duplication and allows new studies to build on existing projects, data platforms and partnerships. Second, it shows where evidence is concentrated and where it is thin relative to the burden of disease (Chapter 3) and the priority themes (Chapter 5). Third, it identifies completed work that has not yet been documented, published or used in decisions.

This chapter describes existing activity; it is not a priority list. The presence of an activity here does not make its topic a priority, and its absence does not make a topic unimportant. Priorities are justified by burden, equity and national relevance through the CHNRI-style scoring in Section 2.6, not by the existing partner portfolio.

7.1 Objectives of the Mapping

The mapping has five objectives:

1. To compile a consolidated inventory of research, implementation science, operational research, evaluations, surveys and evidence platforms involving the county's health facilities, staff, data or communities.
2. To classify each activity by thematic area, type of activity, lead institution, status and verification level.
3. To compare the distribution of activity with the county's priority themes and burden of disease and so identify concentrations and gaps.
4. To identify existing projects and platforms that the agenda can build on, scale up or embed priority questions within.
5. To establish the baseline for a living research inventory maintained by the Research and Knowledge Management Unit (Section 6.2, Terms of Reference B and F).

7.2 Approach and Sources

The mapping drew on five sources:

- i. the bibliography of publications and research documents from the last ten years (Annex 5);
- ii. county records of research requests and authorisations held by the Research and Knowledge Management Unit;
- iii. partner project documents, dissemination materials and conference abstracts;
- iv. submissions from unit and programme heads through the research gap analysis tool (Section 2.5); and
- v. consultation with programme coordinators.

The results of the scoping review (Section 2.3) will be used to update the mapping once screening is complete.

Each activity was classified by type using the typology in Table 7.1, and assigned a status and a verification level:

- **Status:** ongoing; completed but unpublished (internal report, abstract or presentation only); or completed and published (peer-reviewed article, thesis or public report).
- **Verification level:** verified (a publicly available source is listed in the references); or to validate (internal or partner records that must be confirmed with the lead, with written permission obtained before public release; see Annex 8).

Table 7.1: Typology of research, implementation science and evidence activities

Type of activity	Definition	Examples in Makueni
Implementation research and implementation science	Studies of how proven interventions are adopted, delivered, scaled and sustained in routine services, and of strategies that improve uptake.	AMPLI-PPH bundle; MMS introduction; Network of Care
Operational and health systems research	Studies of how services, financing, workforce, supply chains and governance perform, and how to improve them.	Strategic purchasing for PHC; HIV last-mile supply chain; NHIF contracting
Epidemiological and clinical research	Studies that measure burden, risk factors, aetiology or clinical outcomes.	Household cardiometabolic survey; HPV study; AMR point prevalence study
Programme evaluation	Assessments of whether a programme achieved its intended results, for whom and at what cost.	Community dementia screening; CHUSLA performance-based financing

Type of activity	Definition	Examples in Makueni
Population surveys and surveillance	Periodic, standardised measurement of indicators at population or facility level.	SMART 2023; KDHS 2022 county fact sheet; substance-use rapid assessment
Quality improvement and clinical audit	Structured CQI projects, death reviews and audits that generate local evidence.	MPDSR reviews; IPC studies; obstetric safe surgery
Digital health and innovation	Introduction, adaptation and use of digital tools and new technologies in service delivery.	PROMPTS; Kenya Quality Ecosystem; Proximie

7.3 Inventory of Key Activities

The inventory is presented in three parts. Table 7.2 lists 18 county-anchored activities, meaning those led by, or implemented with, the Department of Health Services. Table 7.3 lists published research on Makueni produced mainly by academic and research institutions. Table 7.4 lists the routine data platforms that generate evidence the agenda can use. Full citations are given in Chapter 13 and Annex 5.

7.3.1 County-anchored research and implementation activities

Table 7.2: Inventory of county-anchored research, implementation science and evidence activities

No.	Activity	Lead and partners	Type	Status	Source and verification	Relevance and use for the agenda
A. RMNCAH-N and quality of care (Theme 1)						
1	AMPLI-PPH: postpartum haemorrhage bundle implementation	County and partners (JHPIEGO)	Implementation research	Ongoing	County and partner records (to validate)	Adoption of the PPH bundle and EmONC capacity; platform for measuring the effect on PPH-related maternal deaths (Annex 2, item 1).
2	Multiple micronutrient supplementation (MMS) implementation research	County; Vitamin Angels	Implementation research	Ongoing	Internal and partner records (to validate)	Evidence to guide introduction and scale-up of MMS in antenatal care: acceptability, adherence, anaemia and supply.
3	Kenya Quality Ecosystem	Jacaranda Health; County	Quality improvement; digital health	Ongoing	Project documents [11,12]	Use of data, feedback and digital tools to improve the quality of maternal and newborn care and demand for it.

No.	Activity	Lead and partners	Type	Status	Source and verification	Relevance and use for the agenda
4	PROMPTS digital maternal health platform	Jacaranda Health	Digital health innovation	Ongoing	Project documents [11,12]	AI-enabled two-way SMS for pregnant and postpartum women; not yet evaluated for its county effect on care seeking, equity or cost.
5	Obstetric safe surgery	Jhpiego; County	Quality improvement; implementation	Ongoing	Internal and partner records (to validate)	Quality and safety of caesarean and emergency obstetric surgery; links to surgical site infection surveillance (Annex 2, item 9).

B. Non-communicable diseases and cancer (Themes 2 and 3)

6	Household cardiometabolic disease survey and NCD caregiver-burden study	County; ARUA Centre of Excellence for NCDs; partners	Epidemiological survey	Completed ; unpublished	Internal dissemination report; county news release [7] (to validate)	Hypertension about 38% and high CVD risk about 26%; findings informed PCN NCD clinics, outreaches and commodity strengthening. Manuscript pending.
7	Baseline household and facility survey on NCD risk factors (Makueni and Nyeri)	Amgen NCD Programme ; partners	Epidemiological survey; facility assessment	Completed ; draft findings (2024)	Draft findings presentation [34] (to validate)	Corroborates the county cardiometabolic burden (hypertension 38%, diabetes about 7%).
8	HPV prevalence and cervical abnormalities study	KEMRI; County	Epidemiological research	Completed ; pre-publication	County-KEMRI dissemination [13]	Concerning HPV trends; evidence for screening scale-up, HPV vaccination and the screen-and-treat cascade.

C. Communicable diseases, AMR and health products (Themes 4, 13 and 14)

9	Antimicrobial resistance (AMR) point prevalence study	County; partners	Epidemiological (point prevalence)	Completed ; unpublished	Internal records (to validate); consistent with a multi-county study [30]	Antimicrobial use and resistance patterns; basis for stewardship, surgical prophylaxis protocols and a county antibiogram.
10	HIV commodity last-mile	County; supply	Operational research	Completed ; conference	ICASA presentation [6]	Stock visibility and HIV commodity security; increasingly relevant as external

No.	Activity	Lead and partners	Type	Status	Source and verification	Relevance and use for the agenda
	inventory management	chain partners		presentation (2023)		HIV financing falls (Chapter 11).
11	Infection prevention and control (IPC) studies in facilities	County	Operational research; quality improvement	Completed ; abstracts only	National conference records (to validate)	Presented at national platforms; to be catalogued and converted into manuscripts and policy briefs.
D. Nutrition, community health and health financing (Themes 5, 6 and 7)						
12	Makueni Integrated SMART Survey 2023	County; Ministry of Health; partners	Population survey	Completed ; published	Survey report and KNBS catalogue [4,16]	GAM 6.2% and stunting 17.6% among children 6–59 months; used for nutrition and maternal and child health planning.
13	CHP socioeconomic empowerment and CHUSLA performance-based financing	County; Financing Alliance for Health	Implementation research; programme evaluation	Ongoing	Internal and partner records (to validate)	Evidence on CHP motivation, financial empowerment, performance-based financing and community indicators.
14	Strategic purchasing for PHC and UHC studies	ThinkWell; KEMRI-Wellcome Trust Research Programme	Health systems research	Completed ; published and technical briefs	Project materials and publications [14,15]	Evidence on strategic purchasing, MakueniCare and financial protection; baseline for assessing the SHA transition.
E. Specialised care, digital health and mental health (Themes 8 and 10)						
15	Proximie telemedicine for safe surgery	County; Proximie	Digital health innovation	Ongoing	Internal and partner records (to validate)	Remote specialist support, surgical mentorship and quality improvement; no evaluation documented yet.
16	Rapid assessment of drugs and substance use	County	Population survey	Completed 2023; unpublished	Internal report [28] (to validate)	Over 49% reported alcohol or substance use; 11.8% alcohol dependent. Informs the mental health and substance use theme.
F. Research system and agenda development						
17	Knowledge Management Priorities Mapping Survey and	Research and KM Unit	Organisational assessment	Completed ; internal	Internal records (to validate)	Identifies KM priorities and research capacity gaps; inputs to Strategic Objective 2 and to prioritisation.

No.	Activity	Lead and partners	Type	Status	Source and verification	Relevance and use for the agenda
	Training Needs Assessment					
18	Practitioner research gaps survey and unit heads' gap analysis	Research and KM Unit; unit and programme heads	Stakeholder consultation	Ongoing (agenda development)	Sections 2.4 and 2.5	Gaps identified by practitioners and programmes feed the long list scored in Section 2.6.

Activities marked "to validate" are drawn from internal or partner records. Their names, leads, status and figures must be confirmed, and permission obtained, before the agenda is published.

7.3.2 Published research on Makueni

Independent academic research adds to the county-anchored portfolio. Table 7.3 lists the 27 peer-reviewed studies and theses with Makueni-specific findings identified to date, including ten added in the first round of the scoping review (Section 2.3); the remaining screening will extend the list.

Table 7.3: Published research with Makueni-specific findings, 2015–2025

Area	Study	Contribution	Ref.
Maternal and newborn health	Mwaisaka et al., 2025	Network of Care implementation research on accountability and referral in maternal and newborn health.	[22]
Maternal and newborn health	Gitimu et al., 2015	Skilled birth attendance (2012 survey, n=1,205) was higher with maternal and partner education, antenatal care and living within 5 km of a facility.	[76]
Maternal and newborn health	Iluka et al., 2024	Neonatal referrals to the county referral hospital: lack of stabilisation, slow response and ambulance unavailability were linked to unsafe, untimely referral.	[82]
Health financing and UHC	Kamau, 2024	Rights-based analysis of Makueni's universal health coverage programme.	[15]
Health financing and UHC	Kazungu et al., 2023	Choice of NHIF-contracted outpatient facilities in Makueni and Nyeri.	[20]
Health financing and UHC	Nyawira et al., 2021	Stakeholder perceptions of health facility financing under devolution.	[21]
Mental health	Mutiso et al., 2018	Step-wise community engagement and capacity-building model before mental health service roll-out.	[17]

Area	Study	Contribution	Ref.
Mental health	Mutiso et al., 2020	WHO-AIMS assessment used to develop the county mental health system.	[18]
Ageing and dementia	Farina et al., 2025	Evaluation of a community dementia screening programme.	[23]
Ageing and dementia	Musyimi et al., 2024	Community screening of 3,546 adults aged 60 and over: 18.4% screened positive for dementia, with poorer quality of life and more loneliness.	[84]
AMR	Kiiru et al. (HATUA), 2023	Multi-county study including a Makueni facility; 66% of bacterial isolates from urinary tract infections were multidrug-resistant.	[30]
Health products	Wanjohi, 2019	Effect of devolution on the availability of NCD medicines at Makueni County Referral Hospital (thesis).	[27]
Health products	Wirtz et al., 2020	Survey of NCD medicines in eight counties: availability was far below that of acute medicines; Makueni had the highest county availability (0.42).	[85]
Occupational health	Kisangau et al., 2018	Hepatitis B infection and vaccine uptake among health care workers.	[19]
Environmental health	Gevera et al., 2022	Public knowledge of drinking water quality: 53% did not know the harms of high fluoride, although 91% knew someone with dental fluorosis.	[24]
Environmental health	Gevera et al., 2022	Potential fluoride exposure from food crops grown in the county.	[25]
Environmental health	Mbithi, 2017	Groundwater fluoride up to 4.2 mg/L around Kiboko; moderate-to-severe dental mottling in 33–38% of respondents in Makindu and Kiboko (thesis).	[80]
Food safety	Malusha et al., 2015	Aflatoxin in household maize in Kibwezi and Kilome: 25–33% of lowland and 4–13% of highland samples positive, higher in the second season.	[70]
Food safety	Kamano et al., 2022	Storage practices and aflatoxin in maize in Makueni and Baringo: 24–68% of Makueni samples, by area, exceeded 10 µg/kg; contamination highest in gunny bags.	[71]
Food safety	Ogallo et al., 2023	Aflatoxin in 85% of maize-based foods eaten by lactating mothers; margin of exposure indicated high dietary exposure.	[72]

Area	Study	Contribution	Ref.
One Health	Nthiwa et al., 2015	Trypanosome infection rates in tsetse flies in Mito Andei Division.	[26]
One Health	Chuchu et al., 2023	SMS reminders at the county referral hospital raised completion of rabies post-exposure prophylaxis after dog bites (about 3.4-fold odds).	[81]
Injuries	Ochola et al., 2018	Hospital-based snakebite epidemiology at four sites including Makueni: incidence 5.4 per 100,000 a year; antivenom given in about 6% of Makueni cases (2007–2009 data).	[73]
Immunisation	Wambua MM et al., 2023	Full immunisation coverage of 82% among children aged 12–23 months, below the WHO target; socio-demographic factors were associated with uptake.	[78]
Cancer	Wambua RT et al., 2023	Male involvement in partners' cervical cancer screening: only 18% of 291 married men were highly involved.	[77]
Community health	Kithuka, 2016	Retention of community health workers (69.4% of 552) was predicted by financial incentives, health updates, reporting tools and medical kits (thesis).	[79]
Gender-based violence	Wamue-Ngare et al., 2024	Costs borne by survivors supported by the Makueni GBV Recovery Centre and a Naivasha programme, including property losses, missed schooling and injury.	[83]

7.3.3 Routine evidence platforms

Much of the evidence the county needs already sit in routine systems. These platforms are research assets in their own right: analysed well, they can answer many priority questions at low cost (Section 8.5.2). The analysis of KHIS data in Chapter 3, which revealed rising neonatal deaths, a high injury burden and possible miscoding of causes of death, shows what they can yield.

Table 7.4: Routine data platforms and their research potential

Platform	What it generates	Research use	Current limitation
Kenya Health Information System (KHIS)	Facility service delivery, morbidity and mortality data	Burden ranking; trend and interrupted time-series evaluations	Denominator errors (immunisation above 100%); duplicate and non-specific diagnostic

Platform	What it generates	Research use	Current limitation
			codes; limited disaggregation
Electronic Community Health Information System (eCHIS)	Household visits, referrals and community indicators	CHP performance and referral-completion studies	Recent roll-out; completeness not yet assessed
Maternal and perinatal death surveillance and response (MPDSR)	Death reviews with causes and avoidable factors	Trends in PPH and perinatal deaths; effect of the PPH bundle; causes of the rise in neonatal deaths	Reviews not analysed systematically across years
Hospital cancer registry	Cases by site (2024: breast 555, prostate 479, cervix 210) [28]	Cancer burden; stage at diagnosis; diagnosis delay	Hospital-based, not population-based
Laboratory and AMR data	Culture and sensitivity results	County antibiogram; stewardship evaluation	Limited microbiology capacity and coverage
SMART and KDHS surveys	Population nutrition and health indicators [3,4]	Baselines and trends for county indicators	Periodic; county-level estimates only
CQI projects and clinical audits	Facility improvement and audit data	Quality-improvement-to-research pipeline (Section 8.5.1)	Rarely documented with research methods
County scientific conference and dissemination forums	Abstracts and presentations of local work	Catalogue of local evidence; visibility	Abstracts not tracked to publication or use

7.4 Evidence Map: Activity Against Burden and Priority Themes

Table 7.5 sets the mapped activities against the fifteen thematic areas (Section 5.1) and the burden signals from Chapter 3. For each theme it shows the number of county-anchored activities (Table 7.2) and published studies (Table 7.3), a provisional rating of evidence coverage, and the main gaps signalled in Annex 2. Coverage ratings are defined as follows:

- **Strong:** several completed and ongoing activities, including published county evidence.
- **Moderate:** some county evidence exists, but key questions remain unanswered.
- **Limited:** one or two activities, or only national or indirect evidence.
- **None:** no county activity identified.

Table 7.5: Evidence map of mapped activities by thematic area (provisional)

No.	Thematic area	County - anchored	Published	Coverage	Burden signal (Chapter 3)	Main evidence gaps
1	RMNCAH-N and quality of care	5	1	Strong	High: facility neonatal death rate rising to 12.4 per 1,000; facility maternal deaths rising since 2023/24	Causes of rising neonatal deaths; neonatal sepsis; systematic analysis of perinatal audits; anaemia in pregnancy; adolescent pregnancy; respectful care (Annex 2, items 1, 2, 6)
2	NCDs and multimorbidity	2	0	Moderate	High: hypertension the leading recorded cause of adult inpatient death; diabetes cases up 15%	Care cascades in PCNs; adherence; in-hospital mortality; multimorbidity; kidney complications (item 10)
3	Cancer prevention and control	1	0	Limited	High: 1,244 breast, prostate and cervical cancer cases in the 2024 registry	Screening coverage; diagnosis delay; treatment completion; breast and prostate cancer; palliative care (item 12)
4	Communicable diseases, HIV, TB, malaria and AMR	1	1	Moderate (AMR); Limited (HIV, TB, malaria)	High: urinary tract infections third in outpatient morbidity; HIV and TB among top seven adult inpatient deaths	Viral load failure; TB case-finding yield; child pneumonia; local pathogen and resistance data (items 3–8)
5	Nutrition, food security and climate-sensitive health	1	0	Moderate	Moderate: GAM 6.2%; stunting 17.6%; anaemia the leading cause of adult admission	Seasonal drivers of wasting and stunting; climate–nutrition–WASH links; intervention studies (item 16)
6	Community health systems and PHC	1	0	Limited	System: central to PHC Act reforms	CHP retention and supervision; eCHIS use; referral completion; PCN functionality
7	Health financing and UHC	1	3	Strong	System: SHA and FIF transition	Effects of SHA and Facility Improvement Financing; out-of-pocket spending (item 13)

No.	Thematic area	County - anchored	Published	Coverage	Burden signal (Chapter 3)	Main evidence gaps
8	Digital health, data science and AI	1	0	Limited	System: denominator and coding errors in KHIS	Evaluation of digital tools in use; data quality; interoperability; governance of AI
9	Public health emergencies, One Health and climate change	0	1	Limited	Moderate: recurrent drought; wildlife–livestock interface	Outbreak preparedness; zoonoses and rabies; drought–health surveillance
10	Mental health, substance use, disability and rehabilitation	1	3	Moderate	High: 49% reported substance use; 11.8% alcohol-dependent	Coverage of PHC-level screening; suicide; substance use interventions (item 11)
11	Injuries, violence, emergency and critical care	0	1	Limited	High: injuries second in under-five outpatient morbidity (39,157 cases); head injury in top ten admissions; snakebite incidence 5.4 per 100,000 a year (hospital data, 2007–2009)	Causes of childhood injuries; ambulance response and outcomes; road traffic injuries; ICU outcomes; GBV; snakebite incidence, antivenom access and treatment delays (item 20)
12	Specialised clinical, surgical and palliative care	0	0	Limited	High: acute kidney failure sixth among adult inpatient deaths	Related work is counted under Themes 1 and 8 (obstetric safe surgery, Proximie). Gaps: kidney disease and dialysis (item 18); surgical waiting times and safety; palliative and geriatric care
13	Diagnostics, health products and technologies	1	1	Limited	System: empirical treatment of common infections	Laboratory turnaround; prescribing patterns; pharmacovigilance; blood transfusion
14	Health workforce, quality of care and patient safety	1	1	Limited	System: coverage–quality gap across services	Staffing and workload; burnout; patient safety incidents; patient experience

No.	Thematic area	County - anchored	Published	Coverage	Burden signal (Chapter 3)	Main evidence gaps
15	Environmental health, WASH and health promotion	0	5	Moderate	Moderate: 46% basic water and 46% basic sanitation; aflatoxin in most maize-based foods tested	WASH and diarrhoeal disease; health care waste; effective health promotion approaches; aflatoxin exposure and control; pesticide residues and exposure (item 19)
	Total (thematic activities)	16	17			Two further activities concern the research system itself (Table 7.2, group F).

Counts reflect each activity's primary theme only and are provisional pending the scoping review. Coverage ratings and burden signals are technical judgements for validation, not scores; they inform but do not replace the CHNRI-style scoring (Section 2.6).

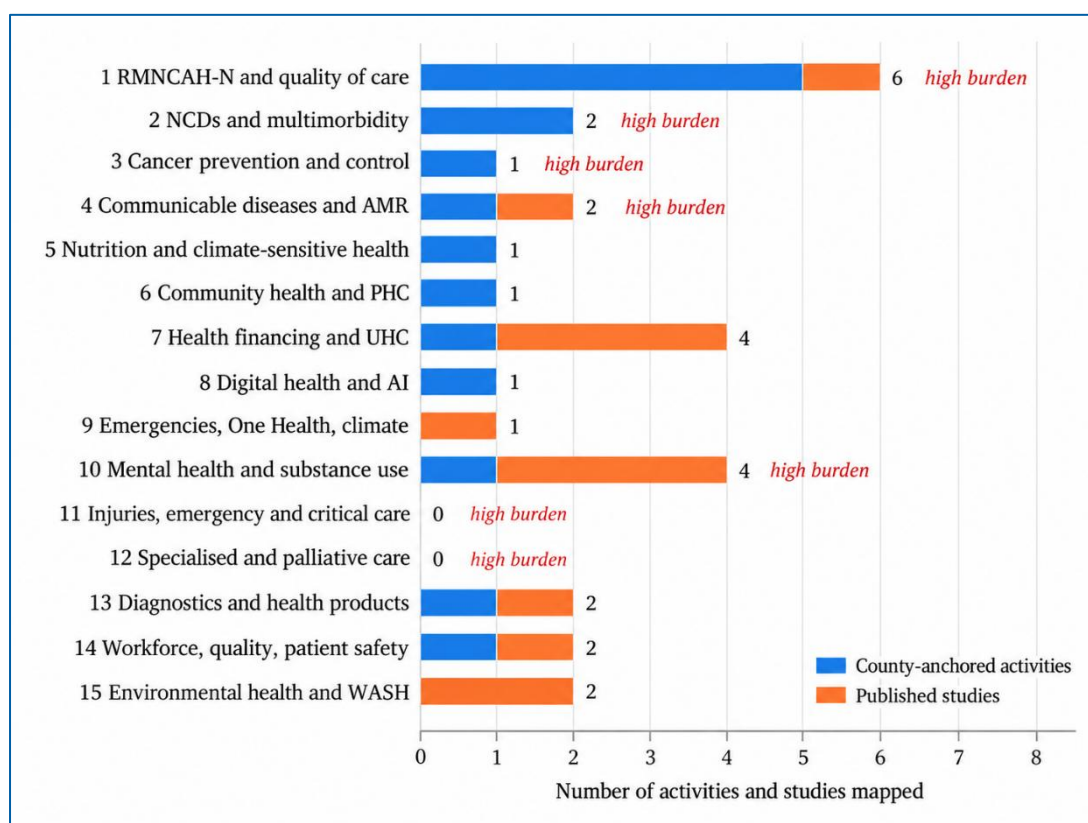


Figure 7.1: Mapped activities and studies by thematic area, with high-burden themes flagged

7.5 Key Findings from the Mapping

Seven findings emerge from the mapping:

1. **Evidence is concentrated in maternal and newborn health and in health financing.** These two areas account for 10 of the 33 thematic activities and studies mapped, reflecting long-standing partner investment and Makueni's national profile as a UHC learning county.
2. **Evidence does not follow disease burden.** Several of the county's heaviest or fastest-growing burdens have little or no county evidence: injuries among children under five; in-hospital deaths from hypertension and diabetes; acute kidney failure; urinary tract infections and the resistance associated with them; and HIV and TB treatment outcomes. Even in maternal and newborn health, where activity is strongest, no study addresses the rise in neonatal deaths.
3. **Implementation is strong, but documentation and publication are weak.** Of the 18 county-anchored activities, 8 are ongoing and 8 are completed but unpublished; only 2 have produced a public report or publication. Completed work such as the AMR point prevalence study, the IPC studies, the cardiometabolic survey and the substance use assessment exists only as internal reports, presentations or abstracts.
4. **The portfolio is largely partner-initiated.** External partners lead or fund most activities, with county staff serving mainly as sites and implementers rather than as principal investigators. This limits county influence over research questions, data and authorship, and leaves the portfolio exposed to shifts in external funding (Chapter 11).
5. **There is a need to evaluate digital tools:** PROMPTS, the Kenya Quality Ecosystem and Proximie are in routine use, but no county-level evaluation of their effectiveness, equity or cost was identified.
6. **Routine data platforms are under-used and need strengthening (documentation registers, reporting tools):** KHIS, eCHIS, MPDSR reviews, the hospital cancer registry and laboratory data hold years of information that could answer priority questions at low cost, but they are rarely analysed beyond routine reporting, and denominator and coding errors limit their reliability.
7. **The route from evidence to decisions is seldom documented.** Some activities show clear use, such as the cardiometabolic survey informing PCN NCD clinics and the SMART survey informing nutrition planning. For most, however, there is no record of how findings reached policy, CQI or budgets, and few report results by sub-county, sex, age or disability,

so the equity of coverage cannot yet be judged (Prioritisation matrix- cancer prevalence-spatial-temporal)

7.6 Building on Existing Activities

The fastest and cheapest way to answer many priority questions is to build on work already under way. Table 7.6 identifies existing activities and platforms into which priority questions (Section 5.4) can be embedded, and the low-cost designs that suit them (see also Sections 8.5.1 and 8.5.2).

Table 7.6: Opportunities to build on existing activities

Existing activity or platform	Opportunity for the agenda	Theme; Annex 2	Suggested low-cost approach
E-MOTIVE bundle and MPDSR reviews	Measure the effect of the PPH bundle on PPH-related deaths and severe morbidity; analyse the causes of the rise in neonatal deaths	1; items 1–2	Interrupted time series on MPDSR and KHIS data; stepped-wedge design where roll-out is phased
MMS implementation research	Assess adherence, effects on anaemia in pregnancy and the cost of county-wide scale-up	1, 5	Embedded cohort within antenatal care; costing study
PROMPTS and Kenya Quality Ecosystem	Evaluate effects on antenatal and postnatal attendance, danger-sign reporting and equity	1, 8	Secondary analysis of platform and KHIS data; cost-effectiveness analysis
Cardiometabolic and NCD baseline surveys	Publish findings; track hypertension and diabetes care cascades in PCNs; audit in-hospital deaths	2; item 10	Manuscript; PCN NCD registry and cascade dashboard; death audit
KEMRI HPV study and hospital cancer registry	Measure the screen-and-treat cascade and diagnosis delays	3; item 12	Cascade analysis; registry strengthening
AMR point prevalence study and laboratory data	Build a county antibiogram, starting with urinary tract infections and neonatal sepsis, and a stewardship baseline	4, 13; items 6–8	Sentinel surveillance sites; repeat point prevalence survey
IPC studies	Convert abstracts into manuscripts; link to surgical site infection surveillance	14; item 9	Writing clinics (Section 8.5.2)
CHUSLA performance-based financing	Link CHP empowerment to eCHIS performance and retention	6	Before-and-after analysis using eCHIS data

Existing activity or platform	Opportunity for the agenda	Theme; Annex 2	Suggested low-cost approach
Strategic purchasing and UHC studies	Assess effects of SHA and Facility Improvement Financing on access, revenue and out-of-pocket spending	7; item 13	Facility financial data; household expenditure module
SMART Survey 2023	Seasonal nutrition surveillance and climate links	5; item 16	Repeat SMART surveys; link to drought early-warning data
Proximie telemedicine	Evaluate surgical outcomes, referrals avoided and cost	8, 12	Audit of tele-mentored cases
Substance use rapid assessment	Publish; design and test PHC-level screening and brief interventions	10; item 11	Manuscript; pilot with embedded evaluation
KHIS outpatient and inpatient data	Describe the causes and settings of childhood injuries; check cause-of-death coding	8, 11	Secondary analysis; chart review of a sample of deaths

7.7 Maintaining an Active Research Inventory

This mapping is a baseline, not a one-off exercise. Under Terms of Reference B and F (Section 6.2), the Research and Knowledge Management Unit will maintain it as a living inventory linked to the county research repository (Strategic Objective 4, Section 8.2), as follows:

- **Registration at entry:** every study seeking county authorisation (Section 4.4 and Annex 4) is entered using the minimum data set in Table 7.7.
- **Quarterly update:** research focal persons update status, outputs and use each quarter, and the Unit reports to the CHMT using the indicators in Chapter 9.
- **Annual evidence map:** an updated Table 7.5 is presented at the county scientific conference and feeds the periodic reprioritisation (Section 8.3).
- **Validation and permission:** internal and partner entries are verified against protocols, approvals and partner agreements, and listed publicly only with written permission.
- **Retrospective capture:** the scoping review and a call to partners record studies conducted since 2015 that are not yet in the inventory.

Table 7.7: Minimum data set for the county research inventory

Field group	Data items
Identification	Inventory ID; title; principal investigator; county co-investigator; lead and partner institutions; funder
Classification	Primary and secondary theme (Chapter 5); type of activity (Table 7.1); Annex 2 condition, where applicable
Setting	Sub-county; facility name and level; population group
Approvals	ISERC approval number; national research licence number; county and facility authorisation date; data-sharing agreement in place (yes/no)
Timeline and resources	Start and end dates; current status; budget and funding source
Outputs	Reports, abstracts, publications, dataset metadata and policy briefs; repository link
Use	Dissemination to the Department and communities; documented use in policy, CQI, budget or programme decisions

7.8 Conclusion and Next Steps

Makueni has an active and growing portfolio of research and implementation science, much of it of national interest. The portfolio is, however, uneven: concentrated in a few themes, misaligned with several of the heaviest burdens, largely partner-led, under-documented and weakly linked to decisions. The task for this agenda is not to start again, but to consolidate what exists, publish and use completed work, redirect new effort towards neglected high-burden areas, and make the county an active co-owner of the evidence generated within it. The immediate next steps are set out in Table 7.8.

Table 7.8: Next steps arising from the mapping

N o.	Action	Responsibility	Timeline
1	Validate every internal and partner activity in Table 7.2 with its lead, and obtain written permission before public listing	Research and KM Unit; programme leads	Before publication (2026/27)
2	Complete the scoping review (Section 2.3) and update Tables 7.2 to 7.5	Scoping review team	By June 2027 (2026/27)
3	Load the inventory into the county research repository using the minimum data set	Research and KM Unit; health records and ICT	2026/27–2027/28 (Annex 8, objective 4)
4	Support conversion of completed, unpublished studies (AMR, IPC, cardiometabolic, substance use) into manuscripts and policy briefs	Research and KM Unit; study teams; academic partners	2026/27–2027/28 (manuscript writeshops, Annex 8, objective 6)
5	Commission rapid analyses of the two largest unaddressed burden signals: the rise in neonatal deaths and the burden of childhood injuries	Research and KM Unit; RMNCAH and emergency services coordinators	2026/27
6	Use the evidence map to inform the burden and evidence gap scores in the CHNRI-style prioritisation	Scoring panel	Prioritisation workshop, 2026/27 (Annex 8, objective 1)
7	Present an updated evidence map at the annual county scientific conference	Research and KM Unit	Annually, at the county scientific conference (Annex 8, objective 6)

8. Implementation Framework

8.1 Dissemination and Operationalisation

Following validation (Section 2.7) and approval, the agenda will be launched and disseminated through a county launch forum; sub-county and hospital management meetings; a forum for partners and research institutions; the annual county health scientific conference; and the county research repository and website. The Research and Knowledge Management Unit will integrate the agenda's priorities into the departmental annual work plan and the Annual Development Plan, and will use the agenda to screen and align new research requests.

Dissemination of study findings. Findings of each study are shared first with the facility and staff who took part, through the facility's existing continuing medical education (CME) sessions and management meetings, at no extra cost. For example, a study of antimicrobial use at Mtito Andei Sub-County Hospital would be presented to the hospital's staff at a CME session and to its management team within three months of completion, and then at the annual county scientific conference. Each recommendation from a completed study is entered in a recommendations tracker on the departmental digital dashboard, with the office responsible, the agreed action and its status, and the CHMT reviews progress quarterly (Section 9.1).

8.2 Strategic Implementation Matrix

The agenda is implemented through ten strategic objectives (Table 8.1).

Following validation, start-up actions that had been planned over the first year (appointments, the first prioritisation, Tier 1 research plans, financing and ethics policies) were condensed into the first six months after launch, and an accountable office and supporting offices were named for each strategic objective (Table 8.1).

Table 8.1: Strategic implementation matrix

Strategic objective	Key actions	Outputs	Accountable office (supporting offices)	Timeline
1. Strengthen research governance and coordination	Operationalise the Research and KM Unit; the Chief Officer, Health Human Resource Management and Administration, appoints members of the County Health Research Committee, the Research Ethics and Compliance Committee, sub-county and hospital research	Appointment letters and adopted terms of reference; research SOPs; quarterly inventory; partner coordination mechanism; ranked and validated priority list.	Director, Health Planning and Administration (Research and KM Unit; CHMT)	0–6 months

Strategic objective	Key actions	Outputs	Accountable office (supporting offices)	Timeline
	committees and the Advisory Forum (Section 6.3); develop SOPs for research approvals and partner engagement; create the research inventory; run the first CHNRI-style prioritisation (Section 2.6).			
2. Build internal capacity for research and data management	Train managers and frontline staff in research methods, ethics, data management and analysis, abstract and scientific writing and CHNRI-style scoring; develop mentorship cohorts.	At least two cohorts trained each year; protocols and abstracts developed by trainees.	Research and KM Coordinator (Health human resource management; training institutions)	Annual
3. Institutionalise facility and sub-county research structures	Nominate research focal persons; establish hospital and sub-county research committees; link CQI with operational research.	Functional focal persons in all hospitals and sub-counties; CQI-to-research pipeline.	Director, Health Planning and Administration (medical superintendents; sub-county medical officers of health; quality improvement)	0–12 months
4. Establish a health research and data repository	Design the repository; catalogue reports, abstracts, protocols, publications, dataset metadata and policy briefs; define access levels.	County research and data repository launched and updated quarterly.	Research and KM Coordinator (health records and information; ICT)	0–12 months
5. Strengthen evidence-to-policy and CQI translation	Hold quarterly data review and research translation meetings; produce policy briefs; integrate findings into annual work plans and budgets.	Policy briefs; CQI charters; annual evidence-to-action report.	Director, Health Planning and Administration (CHMT; programme coordinators; monitoring and evaluation)	Quarterly and annual
6. Increase visibility, publication and resource mobilisation	Institutionalise the county scientific conference; support manuscript writing; develop a grants calendar; partner with universities.	At least one protocol, abstract or manuscript submitted per hospital each; annual scientific conference.	Research and KM Coordinator (medical superintendents; academic partners)	Annual
7. Promote smart advocacy and digital health innovation	Develop dashboards, infographics, GIS maps and executive briefs; pilot AI-supported analytics and telemedicine use cases.	Decision dashboards; advocacy briefs; digital health evaluations.	HMIS Lead (ICT; Research and KM Unit; communication)	Annual

Strategic objective	Key actions	Outputs	Accountable office (supporting offices)	Timeline
8. Deliver priority (Tier 1) research	Develop a short research plan for each Tier 1 theme (key questions, designs, lead institutions, timeline, budget); secure ethics approvals; commission or co-implement priority studies with national, academic and development partners.	Six costed Tier 1 research plans; priority studies under way in each Tier 1 theme by month 24; findings summarised in policy briefs.	Research and KM Coordinator (coordinators of Tier 1 programmes; academic and research partners)	Plans 0–6 months; studies 6–60 months
9. Secure sustainable research financing	Cost the agenda; establish a county research budget line with a target share of the health budget; develop a joint resource mobilisation plan with national and development partners.	Costed agenda; resource mobilisation plan; research budget line in the annual work plan.	Chief Officer, Health Human Resource Management and Administration (Director, Health Planning and Administration; County Treasury; partners)	0–6 months, then annual
10. Strengthen ethics, data governance and community engagement	Adopt a county policy on data ownership, sharing, authorship and benefit sharing; agree coordination with the national research regulatory body and accredited ethics committees; require conflict-of-interest declarations; establish community and patient input into priorities and dissemination.	Approved policy and SOPs; data-sharing agreements for partner-led studies; community advisory mechanism.	Research and KM Coordinator (Research Ethics and Compliance Committee; county legal office; community health services)	0–6 months

Appointments required to operationalise the agenda. The research governance structure (Section 6.3) takes effect only when its members are formally appointed. The Chief Officer, Health Human Resource Management and Administration, will:

1. designate the Research and Knowledge Management Unit, its head and staff (months 0–3);
2. appoint the County Health Research Committee and approve its terms of reference (months 0–3);
3. appoint the County Health Research Ethics and Compliance Committee (months 0–3), which then applies for accreditation by the national research regulatory body (months 6–12);
4. appoint sub-county and hospital research committees and facility research focal persons, on the recommendation of sub-county and hospital management teams (months 3–6);
5. constitute the County Health Research Advisory Forum (months 3–6); and

6. ensure that every appointed body holds its first meeting, adopts its terms of reference and files minutes with the Unit within one month of appointment.

8.3 Periodic Reprioritisation

The ranked list produced through the CHNRI-style method (Section 2.6) feeds directly into Strategic Objectives 1 and 8. The Research and Knowledge Management Unit will re-run the exercise every two years, and at the mid-term review in 2028, as new evidence becomes available, including findings from the KM Priorities Mapping Survey, the Training Needs Assessment, the annual evidence map (Section 7.7) and studies completed under this agenda.

8.4 Financing and Resource Mobilisation

The agenda will be financed from several sources: the county exchequer, through a dedicated county budget line for health research and knowledge management; Facility Improvement Financing (FIF) retained by health facilities, for facility-level research, audits and quality improvement where FIF rules allow; partner co-funding aligned to the priorities; in-kind contributions, such as staff time, facility space, laboratory services, routine data, equipment and supervised student research; national sources such as the National Research Fund; and competitive grants. African health ministers, through the Algiers Declaration (2008), committed to allocating at least 2% of national health expenditure to research for health [37]; the County will set its own target with reference to this benchmark.

Estimated cost. The costed work plan (Annex 8) puts the cost of implementing the agenda at KSh 22.4 million over four years (2026/27–2029/30). Of this, KSh 17.1 million is borne by the Department and KSh 5.3 million by six sub-county hospitals (Table 8.2). Costs are highest in 2026/27 (KSh 6.5 million), when the committees are set up and trained and the policy and research plans are drafted, and then settle at about KSh 5.2–5.5 million a year. The Department allocated and used KSh 2 million for health research in each of FY 2025/26 and FY 2026/27. From FY 2027/28, the research budget line will need to rise to the Department's share of the work plan, about KSh 4.2 million that year (Section 8.5.4).

Main cost drivers. Three items account for most of the cost: the annual county health scientific conference (KSh 2.45 million a year to the Department for 200 sponsored participants, printing, and tokens for the MC, keynote speakers and panellists); monthly committee sittings (KSh 546,000 a year); and accreditation of the ethics committee, which requires NACOSTI research integrity and ethics training for its members (KSh 136,500 per trainee, including transport and



per diem) and a one-off NACOSTI application fee of KSh 275,000. Training 30 health workers a year in research methods costs KSh 285,000.

Budget by tier. The work plan funds the systems that serve every tier. Research costs differ by tier. In the first six months, each of the six Tier 1 themes receives a short costed research plan, developed at a writeshop (KSh 247,500 in 2026/27), and Tier 1 studies are then funded mainly through grants, partner budgets and the National Research Fund. Tier 2 themes are pursued mainly through low-cost designs: analysis of routine data, research embedded in quality improvement, supervised student research and collaborative micro-grants. Questions under the cross-cutting enablers are embedded in Tier 1 and Tier 2 studies. Study budgets for each tier are set out in the Tier 1 research plans and the annual work plans, and reported in the annual evidence-to-action report.

Activities at no cost with high yield. 16 of the 27 activities need no expenditure and can be carried out in the boardroom, in existing meetings or on existing platforms: designating the Unit and appointing committees; developing SOPs; building the repository and research inventory on county platforms; quarterly data review and research translation; policy briefs; mentorship and writing clinics; dashboards and executive briefs; linking CQI with operational research; sharing findings with participating facilities through CME sessions; the recommendations tracker; the grants calendar; developing micro-grant proposals; and preparing the research budget line and resource mobilisation plan. These activities deliver much of the agenda's value for governance and evidence use at no additional cost.

Role of hospitals. The six well-established sub-county hospitals will each sponsor at least 20 staff to attend the scientific conference (KSh 1.32 million a year in total). Hospitals may also use Facility Improvement Financing for facility-level research, audits and quality improvement where its rules allow, and host studies and student research.

Partners, stakeholders and grants. Partners and stakeholders are expected to co-fund training, the scientific conference, digital health pilots and priority studies, and to contribute in kind through mentorship, laboratory capacity and supervision of students. The Research and Knowledge Management Unit will mobilise further resources through competitive grants, the National Research Fund and joint bids with academic partners, and through collaborative micro-grants that help staff start small priority studies (Section 6.2). Tier 1 studies will be funded mainly from such grants and partner budgets.

Table 8.2: Budget summary by strategic objective, 2026/27–2029/30 (KSh)

Strategic objective	2026/27	2027/28	2028/29	2029/30	Total	Funding source
1. Governance and coordination	1,365,000	819,000	819,000	819,000	3,822,000	County exchequer
2. Capacity building	285,000	285,000	285,000	285,000	1,140,000	County exchequer; partners
3. Facility and sub-county structures	198,000	–	–	–	198,000	County exchequer; FIF
4. Repository	–	–	–	–	–	No cost (existing platforms)
5. Evidence-to-policy translation	–	–	–	–	–	No cost (existing meetings)
6. Visibility and publication	4,017,500	4,017,500	4,017,500	4,017,500	16,070,000	County exchequer; sub-county hospitals; partners
7. Advocacy and digital innovation	–	–	–	–	–	No cost; partners for pilots
8. Tier 1 research	247,500	–	–	–	247,500	County exchequer; grants; partners
9. Sustainable financing	–	–	–	–	–	No cost
10. Ethics, data governance and community engagement	337,500	365,000	90,000	90,000	882,500	County exchequer
Total, all sources	6,450,500	5,486,500	5,211,500	5,211,500	22,360,000	
Of which: sub-county hospitals	1,320,000	1,320,000	1,320,000	1,320,000	5,280,000	Hospitals (for example FIF)
Department of Health Services	5,130,500	4,166,500	3,891,500	3,891,500	17,080,000	

Source: costed work plan (Annex 8). Figures in KSh; "–" means no expenditure.

8.5 Maximising Impact with Limited Resources

Resources for research will remain limited. This section sets out four strategies to get the most value from the agenda: innovative research approaches, low-cost and high-impact solutions, strategic partnerships, and SMART advocacy.

8.5.1 Innovative approaches

- **Embedded implementation research:** research questions are built into routine services and programme reviews, so that studies inform the decisions they are meant to support.
- **From quality improvement to research:** quality improvement projects with promising results are documented with sound methods and published as studies.
- **Routine data designs:** interrupted time series, before-and-after and other quasi-experimental designs evaluate programmes using HMIS (KHIS and EMR) data, without costly new data collection.
- **Digital and data science tools:** dashboards, geospatial mapping and, where appropriate, AI-supported analytics turn routine data into early warnings and evidence, within the Digital Health Act 2023 and Data Protection Act 2019.
- **Community-based participatory research:** CHPs, community health committees and patients help set questions, collect data and interpret findings.
- **Rapid evidence reviews:** short evidence summaries are produced within weeks when leadership faces an urgent decision.
- **Innovation challenge:** an annual challenge invites staff and students to propose and pilot practical solutions to priority gaps, with small seed grants.
- **Partner supported programs and activities to incorporate a research component**

8.5.2 Low-cost, high-impact solutions

Many priority questions can be answered cheaply by making better use of what the county already has (Table 8.3).

Table 8.3: Low-cost, high-impact solutions

Solution	What it involves	Why it is high impact
Secondary analysis of routine data	Analysing existing KHIS, EMR, register and survey data	Answers many operational questions at almost no data collection cost
Mortality and morbidity audits as research	Analysing maternal and perinatal death reviews and ICU and surgical audits systematically over time	Identifies avoidable causes and tracks the effect of interventions
Student research aligned to the agenda	Directing postgraduate and undergraduate students to priority questions, with co-supervision by county staff	Adds research capacity at little cost and builds a pipeline of local researchers
Multi-facility shared protocols	One protocol and data tool used across several facilities	Larger samples, lower cost per facility and comparable results
Free digital tools	KoboCollect, R, Zotero, Rayyan, the Open Science Framework and the county repository	Removes software costs and supports transparent, reproducible work
Adding questions to existing activities	Including research questions in supportive supervision, data quality audits and scheduled surveys	Avoids separate field exercises
Journal clubs and writing clinics	Regular in-house sessions to appraise evidence and turn work into abstracts and manuscripts	Builds skills and outputs at minimal cost

8.5.3 Strategic partnerships and collaborations

Partnerships will be guided by alignment with this agenda, co-ownership, capacity strengthening for county staff, written data-sharing, authorship and benefit-sharing agreements, and declaration of conflicts of interest (Table 8.4).

Table 8.4: Strategic partnerships

Partner type	Examples	What they bring	What the county offers
Research and academic institutions	KEMRI, universities and other research and training institutions (Annex 9)	Methods, mentorship, laboratory and analytical capacity, grant writing	Research questions, sites, data, implementation partners and policy uptake
National government and agencies	MoH Division of Research and Innovation, Kenya National Public Health Institute, the national research regulatory body, National Research Fund	Policy direction, regulation, national data, research funding	County evidence and a testing ground for national policy
Development and implementing partners	Bilateral and multilateral partners, NGOs	Funding, technical assistance, programme data	Aligned priorities, co-ownership and sustainability planning
Inter-county collaboration	Neighbouring counties, for example through the South Eastern Kenya Economic Bloc	Shared protocols, larger samples, joint funding bids	Leadership on shared problems such as drought and NCDs
Private sector and industry	Diagnostics, pharmaceutical and technology firms	Products, technology and co-funding	Real-world evaluation sites, subject to conflict-of-interest safeguards
Communities and civil society	Community health committees, patient groups, CBOs, faith-based organisations	Local knowledge, participation and accountability	Feedback of results and a voice in priorities

The Department has more than 90 memoranda of understanding with academic, research, development and implementing partners. Priority partners for each Tier 1 theme will be drawn from these agreements and confirmed in the Tier 1 research plans (Strategic Objective 8).

8.5.4 SMART advocacy

SMART advocacy uses evidence to secure specific decisions from specific decision-makers, through objectives that are Specific, Measurable, Achievable, Relevant and Time-bound. It replaces general calls for support with targeted requests timed to the county planning and budget cycle. The approach has seven steps:

1. **Define the objective:** agree the change wanted, for example a dedicated research budget line.
2. **Know the decision-maker:** identify who can make the decision (the CECM, the Chief Officer, the County Treasury or the County Assembly Health Committee) and what they care about.
3. **Make a clear request:** state precisely what is requested, how much and by when.
4. **Package the evidence:** present evidence in short, accessible formats such as policy briefs, infographics, dashboards and stories of impact.
5. **Mobilise allies:** engage champions, including health workers, partners, community leaders and the media.
6. **Time it to the cycle:** engage during the Annual Development Plan, budget and CIDP review windows, when decisions are made.
7. **Monitor and document:** track progress against the objective and record wins and lessons.

Example SMART objective: "By 30 June 2027, the County Assembly approves a health research and knowledge management budget line of at least KSh 4.2 million in the FY 2027/28 county budget, the Department's share of the costed work plan for that year (Annex 8), building on the KSh 2 million allocated and used in each of FY 2025/26 and FY 2026/27."

Table 8.5 proposes three SMART advocacy objectives for the first two years of the agenda. The objectives, amounts, champions and dates are for validation by the CHMT.

Table 8.5: Proposed SMART advocacy objectives, 2026–2028

SMART objective	Decision-maker	Champions	Evidence and products	Timing
By 30 June 2027, the County Assembly approves a health research and knowledge management budget line of at least KSh 4.2 million in the FY 2027/28 county budget, the Department's share of the costed work plan for that year (Annex 8), building on the KSh 2 million allocated and used in each of FY 2025/26 and FY 2026/27.	County Treasury; County Assembly Health and Budget committees	CECM, Health Services; Chief Officer, Health Human Resource Management and Administration; Chair, Assembly Health Committee	Costed work plan (Annex 8); one-page brief on the 2% benchmark and on decisions informed by county research	County Fiscal Strategy Paper (February 2027); budget estimates (April 2027); approval (June 2027)
By 31 March 2027, the Chief Officer, Health Human Resource Management and Administration, appoints the County Health Research Committee and the Research Ethics and Compliance Committee and approves their terms of reference.	Chief Officer, Health Human Resource Management and Administration	Director, Health Planning and Administration; Head, Research and KM Unit	Draft appointment letters and terms of reference (Chapter 6); list of nominees	Within three months of the agenda's approval
By 30 June 2028, the CHMT adopts at least three decisions based on Tier 1 studies or analyses of routine data, each recorded in the FY 2028/29 annual work plan.	CHMT; sub-county health management teams	Head, Research and KM Unit; programme coordinators; facility in-charges	Policy briefs; evidence-to-action report; county scientific conference	Annual work plans 2027/28 and 2028/29; mid-term review (2028)

9. Monitoring, Evaluation, Learning and Reporting

9.1 Monitoring Arrangements

The Research and Knowledge Management Unit will maintain a quarterly dashboard of research, innovation and evidence-use indicators, drawing on the research inventory (Section 7.7) and the repository. The CHMT will review the dashboard and use it to identify capacity gaps, opportunities for policy uptake and priority areas for resource mobilisation. The dashboard includes a recommendations tracker that records each recommendation from completed studies, the office responsible, the agreed action and its status.

9.2 Indicator Framework

Table 9.1 sets out the indicators, their means of verification and the frequency of reporting. Baselines will be established from the research inventory in the first year. Mid-term (2028) targets will be set once baselines are established; the proposed end-term (2030) targets are for validation.

Table 9.1: Monitoring indicators for the Health Research Agenda

Domain	Indicator	Means of verification	Frequency	Baseline (2026)	Mid-term target (2028)	End-term target (2030)
Governance	Number of research requests received, reviewed and authorised	Research inventory	Quarterly	To be set in 2026/27	To be set with the baseline	–
Governance	Proportion of authorised studies aligned with agenda priorities	Research inventory	Annual	To be set in 2026/27	To be set with the baseline	80%
Governance	Median time from complete application to county authorisation (days)	Research inventory	Quarterly	To be set in 2026/27	To be set with the baseline	≤14 days
Governance	Research committees and Advisory Forum appointed and functional (appointment letters issued; share of scheduled meetings held)	Appointment letters; minutes	Quarterly	None appointed	All appointed and functional	All appointed by month 6; ≥75% of meetings held

Domain	Indicator	Means of verification	Frequency	Baseline (2026)	Mid-term target (2028)	End-term target (2030)
Governance	Accreditation of the County Health Research Ethics and Compliance Committee as an ISERC	Accreditation certificate	Annual	Not accredited	Application submitted	Accredited by 2028
Capacity	Number of health workers trained in research methods, and number mentored	Training records	Annual	To be set in 2026/27	To be set with the baseline	≥2 cohorts per year
Capacity	Number of studies with a county staff member as principal or co-investigator	Research inventory	Annual	To be set in 2026/27	To be set with the baseline	≥50% of studies
Research outputs	Number of studies ongoing and completed, by theme and tier	Research inventory	Quarterly	18 mapped (Table 7.2)	To be set with the baseline	–
Research outputs	Number of technical reports, abstracts, publications and policy briefs produced	Repository	Annual	2 published (Table 7.2)	To be set with the baseline	To be set with the baseline
Research outputs	Number of completed studies deposited in the repository with dataset metadata	Repository	Quarterly	0	To be set with the baseline	All completed studies
Evidence use	Number of CQI projects, programme decisions, policies or budget decisions informed by research	Evidence-to-action report	Annual	To be set in 2026/27	To be set with the baseline	To be set with the baseline
Evidence use	Proportion of completed studies whose findings were presented to staff of the participating facility (for example, at a CME session) within three months of completion	Research inventory; CME records	Quarterly	To be set in 2026/27	To be set with the baseline	100%
Evidence use	Proportion of study recommendations with an agreed action that has been implemented	Recommendations tracker (digital dashboard)	Quarterly	To be set in 2026/27	To be set with the baseline	≥75%

Domain	Indicator	Means of verification	Frequency	Baseline (2026)	Mid-term target (2028)	End-term target (2030)
Partnerships and funding	Number of active research partnerships and grant applications; resources mobilised (KSh)	Partnership register; finance records	Annual	To be set in 2026/27	To be set with the baseline	To be set with the baseline
Visibility	Number of conference presentations; county scientific conference held	Conference records	Annual	To be set in 2026/27	To be set with the baseline	Conference held every year
Prioritisation quality	Average expert agreement in the CHNRI-style scoring; proportion of top-ranked questions subsequently resourced	Scoring reports	Every two years	To be set in 2026/27	To be set with the baseline	≥60% of Tier 1 questions resourced
Equity and community engagement	Proportion of studies with community or patient involvement in design or dissemination	Research inventory	Annual	To be set in 2026/27	To be set with the baseline	≥50%
Equity and community engagement	Proportion of studies reporting results by sex, age and sub-county	Research inventory	Annual	To be set in 2026/27	To be set with the baseline	≥75%
Ethics and data governance	Proportion of inventoried studies with documented ethics approval and national research licence	Research inventory	Quarterly	To be set in 2026/27	To be set with the baseline	100%
Ethics and data governance	Proportion of partner-led studies with signed data-sharing agreements; conflict-of-interest declarations on file	Research inventory	Annual	To be set in 2026/27	To be set with the baseline	100%
Financing sustainability	Research and KM budget as a share of the county health budget; share of research funding from county versus external sources	County budget; finance records	Annual	KSh 2 million a year (2025/26 and 2026/27)	To be set with the baseline	To be set with the baseline

9.3 Reporting, Review and Learning

- **Quarterly:** the Unit reports to the Director, Health Planning and Administration, using the dashboard.
- **Annually:** the Unit prepares an evidence-to-action report for the CHMT and departmental leadership, presents an updated evidence map at the county scientific conference, and conducts a horizon scan of emerging issues (Section 11.2).
- **Mid-term review (2028):** an assessment of progress against the strategic objectives and indicators, with a repeat of the CHNRI-style prioritisation.
- **End-term review (2030):** an evaluation of the agenda's implementation and effects, which will inform the next agenda.

Lessons from the reviews will be documented and shared through the repository, the scientific conference and learning exchanges with other counties.

10. Risk Mapping and Mitigation

Table 10.1 sets out the main risks to the implementation of the agenda, their provisional rating and the measures to mitigate them.

Table 10.1: Risks and mitigation measures

Risk	Likelihood	Impact	Mitigation	Lead
Partner priorities dominate the agenda	High	High	Apply the Section 2.6 prioritisation to all new partner proposals; require signed MOUs and alignment checks; involve county co-investigators.	Director, Health Planning and Administration;
The agenda remains unfunded, or partner funding falls	High	High	Cost the agenda; create a county research budget line; pursue pooled and national funding and other stakeholders; prioritise low-cost designs (Section 8.5.2).	Planning and finance; Chief Officer
Research committees and the ethics committee are not appointed or do not function	Medium	High	Appointments within three months of approval (Section 8.2); terms of reference, orientation and secretariat support from the Unit; quarterly review by the CHMT.	Chief Officer, Health Human Resource Management and Administration; Research and KM Unit
Weak internal research capacity	Medium	High	Mentorship cohorts; university partnerships; shared protocol templates; writing clinics.	Research and KM Coordinator; HR
Data quality gaps in KHIS and eCHIS limit answerability	High	High	Data quality assessments; denominator review; cause-of-death coding audits; repository standards; HMIS support to studies.	HMIS and ICT; Research and KM Unit
Ethics, privacy or data-sharing breaches, including release of unpublished partner data	Low	High	IRB clearance, County data policy; written permission before listing or publishing partner data; Data Protection Act compliance.	Data protection officer
Political transition and staff turnover	Medium	Medium	Anchor the agenda in county policy and the CIDP; document SOPs; handover protocols and mentorship.	CECM; Director, Health Planning and Administration

Risk	Likelihood	Impact	Mitigation	Lead
Duplication or conflict with national research bodies	Low	Medium	Alignment with national frameworks (Section 4.2); coordination agreements with the national research regulatory body, ethics committees.	Research and KM Unit; Advisory Forum
Findings are produced but not used	Medium	High	Embed research in programme reviews and CQI; policy briefs; quarterly translation meetings; track use as an indicator (Chapter 9).	CHMT; programme leads

Ratings are provisional and should be reviewed annually by the CHMT.

11. Future Outlook: Emerging Research Frontiers

The health landscape will change during the life of this agenda, and the county should anticipate these shifts rather than react to them. This chapter identifies the main drivers of change and the research questions they are likely to raise, so that the agenda stays relevant beyond its first prioritisation round.

11.1 Drivers of Change and Research Implications

Table 11.1: Drivers of change and research questions to anticipate

Driver	Expected shift for Makueni	Research questions to anticipate
Epidemiological transition and multimorbidity	Continued rise in hypertension, diabetes, cancers, chronic kidney disease and mental health conditions, often alongside HIV and TB	What integrated care models work for patients with several chronic conditions? What is the long-term cost of NCD care to households and to the county?
Demographic change	A growing older population; a large youth population; growth of towns along the Nairobi–Mombasa highway and railway corridor	What services do older people need at PHC level? How are adolescent health, mental health and substance use changing? What health risks come with urbanisation and road traffic growth?
Climate change	More frequent drought, heat stress, water scarcity and food insecurity; possible shifts in vector-borne and water-borne diseases; damage to health infrastructure	How do drought cycles affect malnutrition and disease patterns? Which early-warning indicators predict climate-linked health shocks? How climate-resilient are county facilities?
Unsafe food production and chemical exposures	Growing and poorly regulated use of pesticides and other agrochemicals in horticulture and food production; aflatoxin contamination of maize after drought-stressed harvests and poor storage; fluoride and heavy metals in water and irrigated crops. These raise long-term risks of liver and other cancers, poisoning and poor child growth.	What is the burden of aflatoxin exposure, and which storage practices reduce it? Which pesticides are used, how safely, and what residues reach consumers? How much do aflatoxin and hepatitis B contribute to liver cancer in Makueni?
Human–wildlife contact and snakebite	Expanding farming and settlement near Tsavo West National Park and the Chyulu Hills, and more time in fields and bush during drought, increase exposure to snakes and other wildlife.	How common are snakebites, and what are their outcomes? Is antivenom available where bites occur, and how quickly do patients reach it?

Driver	Expected shift for Makueni	Research questions to anticipate
Emerging infections and AMR	Risk of outbreaks of zoonotic and epidemic-prone diseases; rising antimicrobial resistance	How prepared are facilities for outbreak detection and response? How is resistance changing for common infections?
Geopolitical and financing shocks	Reductions in external financing for health since 2025; disruption of commodity supply chains; price shocks	How have reduced donor funds affected HIV, TB and other programmes? Which services are most at risk, and what domestic financing options work?
Health system reforms	Implementation of the Social Health Insurance Act, the Primary Health Care Act, the Facility Improvement Financing Act and the Digital Health Act	What are the effects of the reforms on access, quality, financial protection and facility revenue?
Technology and artificial intelligence	Growing use of digital tools, telemedicine, AI-supported diagnosis and analytics; new point-of-care and genomic diagnostics	Which digital and AI tools are safe, effective and affordable in county facilities? How should data be governed and protected?

Trends and estimates behind the drivers. Available data point the same way as Table 11.1:

- Population growth and ageing:** the county's population grew from 771,545 in 1999 to 884,527 in 2009 and 987,653 in 2019, about 1.1–1.4% a year [53,90]. A KNBS projection for mid-2023 was 1,042,300, of whom about 32% were under 15 and about 8% (some 82,000 people) were aged 60 or over [90]; the 2026 KHIS planning figure is 1,152,802 [52]. If recent growth continues, the county will have about 1.2 million people by 2030, and the number aged 60 or over could approach 100,000 (estimate).
- Non-communicable diseases:** nationally, 24.5% of adults have hypertension, but only 15.6% of them know it [89], and NCDs now account for an estimated 43% of deaths in Kenya. In Makueni about 38% of adults have high blood pressure, and hypertension and diabetes are among the leading causes of admission and death (Section 3.4). As the population ages, these numbers will rise.
- Climate:** analysis of 1991–2020 records shows a statistically significant rise in minimum and maximum temperatures in every sub-county, and a downward but not significant trend in rainfall [91]. Drought is the county's most frequent hazard, and over 70% of the population relies on rain-fed agriculture [92]. In July 2026 the National Drought Management Authority placed Makueni in the "Normal" drought phase but on a worsening trend, with the risk of child malnutrition below the long-term average but worsening [93].



County KHIS trends in NCD and mental health visits will be added through the annual horizon scan (Section 11.2).

11.2 Keeping the Agenda Future-Ready

- **Annual horizon scanning:** the Research and Knowledge Management Unit conducts an annual scan of emerging threats, technologies and policy changes, and reports it to the CHMT.
- **Flexible window:** a share of the research portfolio (suggested 10–15%) is reserved for emerging and unanticipated priorities.
- **Rapid evidence capacity:** the Unit maintains the capacity to produce rapid evidence summaries within weeks when an outbreak, climate shock or policy change requires a quick decision.
- **National linkage:** the Unit links with the Kenya National Public Health Institute, the Ministry of Health and KEMRI for early warning and joint research on emerging issues.
- **Mid-term reprioritisation:** the mid-term review in 2028 re-runs the prioritisation in light of new evidence and emerging trends.

12. Recommendations for the Next Health Research Agenda

This is the county's first health research agenda. Its successor, which will take effect after 2030, should build on what this agenda achieves and on what its development has taught. This chapter recommends what the next agenda should consider (Section 12.1), the preparatory actions to start now (Section 12.2), and the areas it is likely to focus on (Section 12.3).

12.1 What the Next Agenda Should Consider

- **Start from the end-term evaluation.** The 2030 evaluation (Section 9.3) should show which priorities were funded, which studies were completed and which findings changed policy, programmes or budgets. Priorities that remain unanswered, and the reasons, are the starting point for the next agenda.
- **A complete, living evidence base.** The scoping review should be completed and updated every year from the research inventory, so that the next agenda begins with a current evidence map rather than a new stock-take. Automated searching and screening tools can speed this work, with human verification of every inclusion and a sample of exclusions.
- **Better burden data.** One official population figure, audited denominators and cause-of-death coding, analysed maternal and perinatal death reviews, a population-based cancer registry and disease burden by sub-county, sex and age would allow priorities to be ranked on firmer ground.
- **Wider participation.** All units and programmes, a stratified sample of frontline workers at every level of care, community health promoters, patients, young people, communities, private and faith-based providers, academic partners and the County Assembly should help shape the priorities.
- **Sharper prioritisation.** The next agenda should rank specific research questions, not only themes, using independent scoring against criteria whose weights are agreed in advance, and report expert agreement and how robust the ranking is.
- **Alignment and timing.** It should be developed alongside the next County Integrated Development Plan, the national health policy that succeeds the Kenya Health Policy 2014–2030 and the global agenda that follows the Sustainable Development Goals, and be ready in time for the Annual Development Plan and budget cycle.
- **Costed from the outset.** Each priority should come with a costed research plan, a funding source (county budget line, FIF, partner commitments or grants) and a lead institution.

- **Mature governance.** By then the County Health Research Committee and an accredited ethics committee should be in place, with county policies on data sharing, authorship and the responsible use of AI in research.
- **Evidence use as a test.** The record of how research was used (Chapter 9) should inform the rating of potential impact, so that the next agenda favours questions whose answers the county is ready to act on.

12.2 Preparatory Actions

Preparation for the next agenda starts now. The actions in Table 12.1 would strengthen the reprioritisation at the mid-term review in 2028 (Section 8.3) and lay the groundwork for the agenda after 2030.

Table 12.1: Preparatory actions for the next health research agenda

Area	Proposed action	Timing
Evidence base	Complete and publish the scoping review with its PRISMA-ScR flow, and update the evidence map each year from the living research inventory (Section 7.7).	Before final approval; then annually
Programme managers' input	Extend the gap analysis to every unit, validate submitted figures, and repeat it each year ahead of the Annual Development Plan. Require a data source and year for every gap, and ask units to rank their gaps rather than rate them all high.	Before final approval; then annually
Frontline input	Repeat the practitioner survey with a sample stratified by cadre, facility level and sub-county, including clinical officers, health centre and dispensary staff and CHPs. Use drop-down lists for cadre and workstation, enforce the three-choice limit, and ask respondents to tag each problem as new, recurring or long-standing.	Mid-term review, 2028
Community voice	Add community, patient, youth and private-sector consultation, for example through focus group discussions and community scorecards, and include community representatives on the scoring panel.	Mid-term review, 2028
Burden data	Adopt one official population figure; audit denominators and cause-of-death coding; draw on MPDSR reviews, registries and civil registration; report burden by sub-county, sex and age; and add DALY estimates where available.	2026–2028
Prioritisation method	Score specific research questions, not only themes, through full CHNRI-style independent scoring. Agree criterion weights before scoring, report average expert agreement,	Mid-term review, 2028

Area	Proposed action	Timing
	and test whether the ranking changes under different weights.	
Costing	Cost each Tier 1 research plan and the agenda as a whole, and link the priorities to the Annual Development Plan and the next CIDP.	2026/27 budget cycle
Evidence use	Track which studies informed policy, programme or budget decisions (Chapter 9), and use the results when rating potential impact in later rounds.	Annually
Policy alignment	Review alignment as national strategies that end in 2027 are renewed and as the next CIDP is prepared (Chapter 4).	2027–2028
Emerging issues	Feed the annual horizon scan (Section 11.2), covering climate, ageing, artificial intelligence and changes in external financing, into reprioritisation, and keep a flexible share of the portfolio for new priorities.	Annually

12.3 Likely Focus of the Next Agenda

Where this agenda mainly documents the burden of disease and fills basic evidence gaps, the next agenda is likely to move towards testing, implementing and scaling solutions, and towards integrated questions that cut across programmes. Based on current trends in the county's burden of disease, the emerging frontiers in Chapter 11 and national reforms, it is likely to focus on the following areas:

- **Scaling up what works.** Implementation, cost and sustainability of interventions tested under this agenda, such as the PPH bundle, NCD clinics in Primary Care Networks and Networks of Care, when extended county-wide.
- **Ageing, NCDs and multimorbidity.** Hypertension, diabetes, kidney disease, dementia and palliative care in an older population, and integrated care for people with several conditions.
- **Cancer and environmental exposures.** Early detection and survival, and the contribution of aflatoxin, pesticides and other chemicals, and fluoride, to liver, oesophageal and other cancers.
- **Climate and health.** Effects of drought, heat and water scarcity on nutrition, infectious disease and health services, and climate-resilient facilities.
- **One Health, food safety and AMR.** Zoonoses, snakebite, food safety surveillance and antimicrobial use in people and animals.

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- **Financing and sustainability.** Effects of the Social Health Authority, FIF and primary health care financing on access and financial protection, and of reduced donor funding on HIV, TB and other programmes.
 - **Digital health, data science and AI.** Linked routine data for research, evaluation of AI tools in clinical care and management, and data governance.
 - **Mental health, substance use and injuries.** Integration into primary care, and emergency, trauma and rehabilitation services.
 - **Health workforce and community health.** Productivity, retention and task sharing, and the effect of community health promoters supported by eCHIS.
 - **Equity.** Disability, gender-based violence, adolescents and differences between sub-counties, through community-engaged research.

These focus areas are indicative. The next agenda will confirm them through its own evidence review and prioritisation.

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Health directors (Dr. James Kanyange and David Kiuluku), unit and programme heads	Research gap analysis; validation	Department of Health Services
Sub-county medical officers of health	Validation	Sub-county health management teams
Medical superintendents and facility in-charges	Validation	Sub-county hospitals
Frontline health practitioners (51 respondents)	Practitioner research gaps survey	County health facilities
Collins Etemesi	Senior ICT Officer	Ministry of Health

Annex 2: Disease-Level Evidence Gap Analysis

The thematic areas in Chapter 5 are broad enough to guide governance and resource allocation, but too broad to specify a study protocol. The table below breaks the themes most relevant to disease burden into 20 specific conditions, each assessed for current status, key drivers, previous research (distinguishing published, national and internal county sources), the specific evidence gap for Makueni, and suggested study designs. Unpublished county data are cited as [28] (programme and audit data) and [52] (KHIS).

Table A2.1: Disease-level evidence gap analysis

No.	Priority area	Status (national and Makueni)	Key drivers and predictors	Previous research	Research gaps for Makueni	Suggested study designs and outputs
1	Maternal mortality	National MMR 362 per 100,000 live births (KDHS 2014) and 355 (2019 Census). Makueni facility MMR 87.2 per 100,000 deliveries in 2025/26, up from 51.4 in 2023/24 [52]; the county reports fewer PPH deaths since 2024 [28].	First, second and third delays; PPH; pre-eclampsia; sepsis; anaemia (28.4% of new ANC clients); adolescent pregnancy	Facility audits; MPDSR analyses; effects of free maternity care [28]; AMPLI-PPH bundle implementation (Table 7.2)	County-wide cause-of-death audit; PPH bundle effectiveness; quality gaps from ANC to postnatal care; drivers of the recent rise	MPDSR analytics; stepped-wedge PPH evaluation; referral time-motion studies
2	Neonatal and perinatal mortality and morbidity	National neonatal mortality 21 per 1,000 live births (KDHS 2022). Makueni facility neonatal death rate 12.4 per 1,000 live births in 2025/26, up from 10.2 in 2021/22 and above the national facility rate of 9.3; low birth weight, birth asphyxia and prematurity are the leading causes of under-five inpatient death [52].	Low birth weight, prematurity, delayed resuscitation, hypothermia, infection control gaps	National cause-pattern data; neonatal sepsis studies; KMC adoption [28]	Perinatal death audit; quality of resuscitation; oxygen and newborn unit readiness; KMC coverage; AMR ecology	Perinatal death reviews; newborn unit readiness assessment; KMC coverage study

No .	Priority area	Status (national and Makueni)	Key drivers and predictors	Previous research	Research gaps for Makueni	Suggested study designs and outputs
3	HIV/AIDS	National adult prevalence 4.9% (KENPHIA 2018) [29]; Makueni adult prevalence about 3.2% and about 24,176 PLHIV [6]. HIV is the fourth leading cause of adult inpatient death (54 deaths, 2025/26) [52].	Disparities among youth and women; late diagnosis; stigma; TB co-infection; reduced external funding	KENPHIA 2018 [29]; PMTCT cascade and viral load suppression data [28]	Ward-level epidemic mapping; viral load failure; DSD evaluation; PMTCT gaps; effects of funding cuts	Modelling of local estimates; case-control study of viral load failure; DSD integration pilots
4	Tuberculosis	National incidence estimated at 134–256 per 100,000; slow recovery after COVID-19. Respiratory TB is the seventh leading cause of adult inpatient death (32 deaths, 2025/26) [52].	HIV co-infection, diabetes, malnutrition, delayed diagnosis	National TB reports; GeneXpert and TPT coverage data [28]	Yield of targeted case finding; paediatric TB diagnosis; loss to follow-up	Cluster evaluation of ACF; TPT cohort analysis; hotspot mapping
5	Pneumonia	Leading infectious killer of children under five nationally; fourth in under-five outpatient morbidity (12,319 cases) and third leading cause of adult inpatient death (57 deaths) in Makueni in 2025/26 [52]; seasonal surges.	Incomplete immunisation, malnutrition, indoor air pollution, delayed care seeking	PCV impact studies; referral barrier data [28]	Coverage of hypoxaemia detection and oxygen; aetiology after PCV introduction; adult pneumonia mortality	Facility oxygen and pulse oximetry audit; community referral tracking
6	Neonatal sepsis	High AMR burden nationally, with higher mortality from resistant infections; sepsis caused 10 under-five inpatient deaths in 2025/26 [52]. Gum	Prematurity, prolonged rupture of membranes, invasive devices, harmful	Neonatal sepsis cohorts; stewardship data [28]	Local pathogen and AMR mapping; effectiveness of IPC bundles	Sepsis registry; local antibiogram; IPC bundle evaluation

No .	Priority area	Status (national and Makueni)	Key drivers and predictors	Previous research	Research gaps for Makueni	Suggested study designs and outputs
		cutting has been linked to over 30 child deaths in the county in 2023–2024 [28].	traditional practices			
7	Bone, skin and soft tissue infections	MRSA significant nationally; skin diseases are third and fourth in outpatient morbidity and bacterial cellulitis sixth in adult admissions in Makueni [52].	Diabetes, trauma, late presentation, limited microbiology capacity	National MRSA prevalence studies; surgical surveillance (not Makueni-specific)	Local aetiology and AMR mapping; surgical prophylaxis compliance	Point prevalence survey; surgical prophylaxis QI bundle
8	Urinary tract infections and AMR	Third most common outpatient condition among people aged five and over (76,338 cases, 2025/26) [52]. A multi-county study including a Makueni facility found 66% of bacterial isolates multidrug-resistant [30].	Empirical prescribing without culture; limited laboratory capacity; over-the-counter antibiotics; incomplete courses; catheter use	Kiiru et al. 2023 [30]; national AMR surveillance pilot [31]; county AMR point prevalence study (Table 7.2, unpublished)	County-representative resistance surveillance; laboratory turnaround time and capacity; outcomes of empirical versus culture-guided therapy	Sentinel AMR surveillance sites; point prevalence survey; laboratory capacity assessment; county antibiogram
9	Post-surgical complications	Surgical site infection rates vary; limited surveillance in Makueni.	Emergency surgery, caesarean section, obesity, diabetes	Data on SSI after caesarean section and orthopaedic surgery [28]	SSI surveillance with post-discharge follow-up; IPC audits	SSI registry; IPC audits; improvements in prophylaxis timing
10	Cardiovascular disease and diabetes	Kenya STEPS 2015: raised blood pressure 23.8%, diabetes about 2.4% among adults 18–69 [32]. Makueni household surveys 2024: hypertension 38%, diabetes about 7%, high CVD risk about 26% [7,34]	Obesity, high salt intake, physical inactivity, unhealthy diets, low awareness, poor linkage from screening to care	STEPS 2015 [32]; treatment adherence studies; Amgen NCD baseline survey [34]; county cardiometabolic survey [7]	Screening yield; care cascades in PCNs; task-sharing models; causes of in-hospital death and accuracy of cause-of-death coding	PHC CVD registry; DSD for hypertension; audit of in-hospital deaths

No .	Priority area	Status (national and Makueni)	Key drivers and predictors	Previous research	Research gaps for Makueni	Suggested study designs and outputs
		(unpublished). Hypertension is the second outpatient condition and the leading recorded cause of adult inpatient death; diabetes cases rose 15% between 2022/23 and 2025/26 [52].				
11	Mental health and substance use	Rapid assessment 2023: over 49% of residents reported alcohol or substance use; 11.8% alcohol-dependent, 6.7% tobacco-dependent, 4.3% cannabis-dependent [28]. Departmental data show elevated suicidal ideation, plans and attempts among adults, 2020–2022 [28].	Poverty, gender-based violence, chronic disease, substance use	Mutiso et al. 2018, 2020 [17,18]; national taskforce report; small PHC pilots [28]	Coverage of PHC screening; suicide epidemiology; tele-mental health models	PHC screening trials; stigma-reduction trial
12	Cancer	Rising incidence of cervical, breast, prostate and oesophageal cancer. KNBS vital statistics rank cancer among the leading causes of death nationally [33]. Makueni hospital cancer registry 2024: breast 555 (552 women, 3 men), prostate 479, cervix 210 [28]. County–KEMRI work reports concerning HPV trends [13].	HPV, tobacco, alcohol, late screening and presentation	County–KEMRI HPV and cervical cancer studies [13]; national screening strategies	HPV screening coverage; screen-and-treat completion; diagnosis delay; palliative care gaps	Screening cascade dashboards; diagnosis delay studies

No .	Priority area	Status (national and Makueni)	Key drivers and predictors	Previous research	Research gaps for Makueni	Suggested study designs and outputs
13	Health financing	Transition to the Social Health Authority; out-of-pocket spending remains high.	Fiscal space, procurement efficiency, claims processes	ThinkWell and KEMRI-Wellcome studies [14,15]; Kazungu et al. 2023 [20]; Nyawira et al. 2021 [21]	Incidence of catastrophic out-of-pocket spending; effects of SHA on facility revenue	Household expenditure survey; evaluation of purchasing reforms
14	Health system strengthening	Workforce gaps; commodity stock-outs.	HRH retention, supply chain performance, governance	Wanjohi 2019 on NCD medicine availability [27]; HRH trend data [28]	HRH optimisation; supply chain resilience	Facility readiness index; supply chain QI collaborative
15	Gum cutting (infant oral mutilation)	Linked to over 30 child deaths in the county in 2023–2024 [28]; no population baseline of prevalence exists for Makueni.	Cultural beliefs about teething; low awareness of harm	Ethnographic accounts from other counties (not Makueni-specific)	Prevalence and practice mapping; links to neonatal sepsis and deaths	Household knowledge, attitudes and practice survey; qualitative community study
16	Nutrition	SMART 2023: GAM 6.2% and stunting 17.6% among children 6–59 months [4,16]; anaemia is the leading cause of adult admission [52].	Food insecurity, poverty, seasonal drought, poor dietary diversity, low awareness	Makueni SMART Survey 2023 [4,16]; KDHS nutrition indicators [3]	Sub-county and seasonal estimates of wasting and stunting; drivers of anaemia; effectiveness of interventions	Repeat SMART surveys; seasonal nutrition surveillance; linkage with food security data
17	Injuries	Injuries are the second most common condition among children under five (39,157 outpatient cases, 2025/26), and head injury is among the top ten adult admissions [52].	Falls, burns, road traffic, animal and snake bites, poisoning, violence; limited pre-hospital care	None identified in the county	Causes, settings and outcomes of childhood injuries; road traffic injury burden; ambulance response and trauma outcomes	Analysis of KHIS and facility injury registers; injury surveillance at sentinel sites; ambulance audit
18	Kidney disease	Acute kidney failure is the sixth leading cause of adult	Hypertension, diabetes, late referral,	None identified in the county	Burden and cost of dialysis; predictors of	Renal registry; cost analysis;

No .	Priority area	Status (national and Makueni)	Key drivers and predictors	Previous research	Research gaps for Makueni	Suggested study designs and outputs
		inpatient death (42 deaths, 2025/26) [52]; dialysis demand is growing with hypertension and diabetes.	nephrotoxic medicines, dehydration		late referral; outcomes of acute kidney injury	cohort of dialysis patients
19	Food safety and chemical exposures (aflatoxin, pesticides, heavy metals, fluoride)	Aflatoxin is a Group 1 human carcinogen and a major cause of liver cancer, especially with hepatitis B infection [75]. An outbreak of acute aflatoxicosis in eastern Kenya in 2004, including Makueni, caused 125 deaths [74]. In Makueni, aflatoxin was found in 85% of maize-based foods eaten by lactating mothers [72], and 24–68% of stored maize samples, by area, exceeded 10 µg/kg [71]. Fluoride and salinity in water and crops pose further risks [24,25].	Drought-stressed harvests; poor drying and storage (gunny bags); reliance on maize; unsafe and unregulated use of pesticides and other agrochemicals; limited food safety surveillance	Malusha et al. 2015 [70]; Kamano et al. 2022 [71]; Ogallo et al. 2023 [72]; Gevera et al. 2022 [24,25]; no Makueni study of pesticide residues or exposure identified	Population exposure to aflatoxin (biomarkers in women and children); contribution of aflatoxin and hepatitis B to liver cancer; pesticide use, handling and residues in locally sold produce; heavy metals in irrigated produce	Biomarker survey; market food sampling; liver cancer case-control study using registry data; farmer knowledge and practice survey
20	Snakebite envenoming	A WHO-listed neglected tropical disease. A hospital-based study at Makueni found an incidence of 5.4 per 100,000 a year, with antivenom given in about 6% of cases (2007–2009) [73]. Current county data have not been analysed.	Farming and herding in bush and dry lowlands; evening and dry-season exposure; distance to care; traditional remedies; antivenom availability	Ochola et al. 2018 [73]	Current incidence, deaths and disability; antivenom availability and cold chain at Level 2–4 facilities; time to treatment; first aid and traditional practices	KHIS and facility register analysis; facility antivenom readiness survey; community survey of bites and care seeking

Annex 3: CHNRI-Style Scoring Form

This form will be used from the first reprioritisation round, when independent scoring is introduced (Sections 2.6.2 and 8.3). Each panellist completes the form independently, scoring each research focus area 0, 1 or 2 against each criterion (Table 2.6). Totals are calculated by the Research and Knowledge Management Unit.

Table A3.1: Scoring form

No.	Research focus area	Theme	Burden	Equity	Feasibility	Evidence gap	Policy relevance	Urgency	Impact	Total (of 14)
1										
2										
3										

Panellist declaration. Name: Institution: Date:

I declare that I have no financial or other interest in the research focus areas scored above, other than the following:

Signature:

Annex 4: Research Approval and County Authorisation Process

Table A4.1: Steps in the research approval and authorisation process

Step	Action	Responsible	Output
1	Develop the proposal, aligned with this agenda, and identify a county co-investigator where feasible	Researcher; Research and KM Unit (technical support on request)	Protocol
2	Scientific and ethics review	ISERC accredited by the national research regulatory body	Ethics approval
3	Research licence	National research regulatory body	Research licence; notification of the County Governor and County Commissioner
4	Additional regulatory approval (clinical trials and other regulated studies)	National medicines regulatory authority; other regulators as applicable	Regulatory authorisation
5	County registration and authorisation	Research and Knowledge Management Unit	Entry in the research inventory; county authorisation letter
6	Data-sharing agreement and facility or data access permission	Research and KM Unit; facility in-charge; data custodian	Signed agreement; access permission
7	Implementation, with progress reports	Researcher; research focal person	Quarterly status update in the inventory
8	Final report to the national research regulatory body and the county	Researcher	Final report
9	Dissemination and deposit	Researcher; Research and KM Unit	Presentation to the Department and communities; deposit in the county repository

Annex 5: Bibliography of Notable Publications and Research Documents Relevant to Makueni Health, 2015–2026

The list below is not exhaustive. It provides a starting bibliography of publicly verifiable publications and reports, together with county and internal documents mentioned in the agenda. Internal and unpublished items must be verified and catalogued in the county repository.

Table A5.1: Bibliography

Author or institution	Year	Title or description	Focus area	Status	Ref.
Mutiso et al.	2018	A step-wise community engagement and capacity building model prior to implementation of mental health services in a low- and middle-income country: a case study of Makueni County, Kenya	Mental health; community engagement	Published, peer-reviewed	[17]
Mutiso et al.	2020	Using the WHO-AIMS to inform development of mental health systems: the case study of Makueni County, Kenya	Mental health systems	Published, peer-reviewed	[18]
Kisangau et al.	2018	Prevalence of hepatitis B virus infection and uptake of hepatitis B vaccine among healthcare workers, Makueni County, Kenya 2017	Occupational health; hepatitis B	Published, peer-reviewed	[19]
Kamau	2024	The spirit of human rights: universal health coverage in Makueni County, Kenya	UHC; rights-based health policy	Published, peer-reviewed	[15]
Kazungu et al.	2023	Assessing the choice of National Health Insurance Fund contracted outpatient facilities in Kenya: Makueni and Nyeri	Health financing; strategic purchasing	Published, peer-reviewed	[20]
Nyawira et al.	2021	Health sector stakeholder perceptions on health facility financing and devolution in Kenya, with Makueni representation	Health financing; devolution	Published, peer-reviewed	[21]
Mwaisaka et al.	2025	Enhancing accountability in maternal and newborn health through Network of Care implementation research in Makueni	MNH accountability; referrals	Published, peer-reviewed	[22]
Farina et al.	2025	Evaluation of a community dementia screening programme in Makueni County, Kenya	Dementia; ageing; community health	Published, peer-reviewed	[23]
Gevera et al.	2022	Public knowledge and perception of drinking water quality and its health implications: an example from the	WASH; environmental health	Published, peer-reviewed	[24]

Author or institution	Year	Title or description	Focus area	Status	Ref.
		Makueni County, South-Eastern Kenya			
Gevera et al.	2022	Potential fluoride exposure from selected food crops grown in Makueni County	Environmental health; food systems	Published, peer-reviewed	[25]
Nthiwa et al.	2015	Trypanosoma infection rates in Glossina species in Mito Andei Division, Makueni County	Vector-borne disease; One Health	Published, peer-reviewed	[26]
Malusha, Karama, Makokha	2015	Comparative analysis of aflatoxin contamination of maize in two different physiographic zones and maize seasons in Makueni County, Kenya	Food safety; aflatoxin	Published, peer-reviewed	[70]
Kamano et al.	2022	Storage conditions and postharvest practices lead to aflatoxin contamination in maize in two counties (Makueni and Baringo) in Kenya	Food safety; aflatoxin	Published, peer-reviewed	[71]
Ogallo et al.	2023	Dietary aflatoxin exposure of lactating mothers of children 0–6 months in Makueni County, Kenya	Food safety; maternal nutrition	Published, peer-reviewed	[72]
Ochola et al.	2018	Epidemiology of snake bites in selected areas of Kenya	Injuries; snakebite	Published, peer-reviewed	[73]
Wanjohi	2019	Effect of devolution of health services on availability of medicines for NCDs: a case study of Makueni County Referral Hospital	NCD commodities; devolution	Thesis	[27]
Kiiru et al.; HATUA Consortium	2023	Bacterial etiology of urinary tract infections in patients treated at Kenyan health facilities and their resistance towards commonly used antibiotics	AMR; urinary tract infections (multi-county, including a Makueni facility)	Published, peer-reviewed	[30]
Bartonjo, Ngata, Revathi, Aiken	2022	Strengthening surveillance systems for antimicrobial resistance in urinary tract infections in Kenya	AMR surveillance (national)	Conference abstract	[31]
Makueni County; Ministry of Health	2023	Makueni County Integrated SMART Survey Report 2023	Nutrition	Published report	[4,16]
KNBS and ICF	2023	2022 Kenya Demographic and Health Survey: Makueni County Fact Sheet	Population health indicators	Published report	[3]

Author or institution	Year	Title or description	Focus area	Status	Ref.
Government of Makueni County	2023	Makueni County Integrated Development Plan 2023–2027	County planning; health priorities	Policy and planning document	[1]
Ministry of Health; KNBS; WHO	2015	Kenya STEPwise Survey for Non-Communicable Diseases Risk Factors 2015 Report	NCD risk factors (national)	Published report	[32]
NASCOP	2022	Kenya Population-based HIV Impact Assessment (KENPHIA) 2018: Final Report	HIV (national)	Published report	[29]
KNBS	2019–2023	Economic Survey and Vital Statistics Reports (cause-of-death rankings)	Mortality (national)	Published reports	[33]
Mwanzia	2023	Strengthening inventory management and stock visibility of HIV supply at the last mile in Makueni County	HIV supply chain	Conference presentation	[6]
Jacaranda Health; Makueni County	2024–2026	PROMPTS and Kenya Quality Ecosystem project documents and reports	Digital MNH; quality ecosystem	Project and partner documents	[11,12]
KEMRI; Makueni County	2025–2026	High-risk HPV and cervical abnormalities dissemination materials	Cervical cancer	Pre-publication	[13]
Amgen NCD Programme	2024	Baseline Household and Health Facility Survey on NCD Risk Factors, Makueni and Nyeri Counties	NCDs (household and facility)	Draft findings, unpublished	[34]
Makueni County; ARUA CoE NCD; partners	2025	NCD, caregiver burden and cardiometabolic disease evidence	NCDs; CVD risk	Internal and project report	[7]
Makueni County; Financing Alliance for Health	2025–	CHP socioeconomic empowerment and CHUSLA-PBF implementation research	Community health systems; financing	Ongoing, internal	To validate
Makueni County; Vitamin Angels	2025–	Multiple micronutrient supplementation implementation research	Maternal nutrition	Ongoing, internal	To validate
Makueni County; partners	2025–	AMPLI-PPH bundle of care implementation studies	PPH; maternal health	Ongoing, internal	To validate
Makueni County; partners	Undated	AMR point prevalence and IPC studies presented at national platforms	AMR; IPC	Internal, unpublished	To validate

Author or institution	Year	Title or description	Focus area	Status	Ref.
Makueni County Department of Health Services	2023	Rapid assessment of drugs and substance use	Substance use	Internal, unpublished	[28]
Gitimu et al.	2015	Determinants of use of skilled birth attendant at delivery in Makueni, Kenya: a cross sectional study	Maternal health	Published, peer-reviewed	[76]
Iluka et al.	2024	Institutional factors affecting timely referral and safe transport of neonates in Makueni County Referral Hospital	Newborn health; referral	Published	[82]
Musyimi et al.	2024	Dementia screening in rural Kenya: the prevalence and impact of screening positive for dementia	Ageing; mental health	Published, peer-reviewed	[84]
Wirtz et al.	2020	Availability and prices of medicines for non-communicable diseases at health facilities and retail drug outlets in Kenya: a cross-sectional survey in eight counties	Health products; NCDs	Published, peer-reviewed	[85]
Mbithi	2017	Assessment of the impact of groundwater fluoride on human health in Makindu District, Makueni County (MSc thesis)	Environmental health; WASH	Thesis	[80]
Chuchu et al.	2023	Effect of phone text message reminders on compliance with rabies post-exposure prophylaxis following dog bites in rural Kenya	Zoonoses; One Health	Published, peer-reviewed	[81]
Wambua MM et al.	2023	Determinants of immunization coverage among children aged between 12–23 months in Makueni County	Immunisation	Published, peer-reviewed	[78]
Wambua RT et al.	2023	Determinants of male involvement in partner's cervical cancer screening in Makueni County	Cervical cancer	Published, peer-reviewed	[77]
Kithuka	2016	Predictors of community health workers retention in service in Makueni County (PhD thesis)	Community health; workforce	Thesis	[79]
Wamue-Ngare et al.	2024	Estimating the economic impact of gender-based violence on women survivors in Makueni and Naivasha	Gender-based violence	Published, peer-reviewed	[83]

Table A5.2 records the searches run for the scoping review (Section 2.3), including the first round; the last row lists the sources still to be searched by the review team.

Table A5.2: Scoping review search log

Source	Search string or approach	Date of search	Limits applied	Records (n)
PubMed (web interface)	makueni (all fields)	19 Oct 2026	Publication years 2015–2025	79 (not opened during first screening)
DOAJ (public search interface)	Makueni	19 Oct 2026	None; dates screened manually	103 (31 returned and screened)
Web search engine	"Makueni" with: maternal newborn health; child nutrition stunting; HIV; tuberculosis; hypertension diabetes non-communicable disease; cervical cancer screening; mental health; universal health coverage MakueniCare; community health volunteers; malaria; immunisation vaccination coverage; family planning adolescent pregnancy; brucellosis OR rabies OR zoonoses; drinking water fluoride; health workers devolution; COVID-19; gender-based violence survivors; County Referral Hospital patients; antimicrobial resistance; older persons OR dementia OR disability; and "Kibwezi OR Makindu OR Mbooni health study"	19 Oct 2026	None; dates screened manually	194
Earlier searches; county and partner records	Web and DOAJ searches while drafting; documents supplied by the Department	8 and 16 Oct 2026	2015–June 2025	35 retained
Europe PMC	Makueni, 2015–2025	19 Oct 2026	–	Not searched (automated access refused)
Scopus; Web of Science; Cochrane Library; AJOL; WHO Global Index Medicus; trial registries; institutional repositories; ProQuest	Strings in Section 2.3.5, adapted for each source	Second round	2015–June 2025	Second round (review team)
Total identified in the first round				411

Annex 6: Health Practitioner Research Gaps Survey Questionnaire

The questionnaire was administered online on 5–6 October 2026. It had 13 items in four sections, summarised in Table A6.1.

Table A6.1: Structure of the practitioner research gaps survey

Section	Question (summarised)	What it captures	Format
A. Respondent profile	Cadre; specialty; workstation; years of practice	Who is responding, from what level of care and experience	Free text; single choice
B. Health problems	Conditions seen often or increasingly but poorly understood or managed (up to three)	Emerging and perennial clinical problems	Open-ended
	Service delivery challenges that keep recurring (prompts: patient flow, referrals, stock-outs, staffing, follow-up, record-keeping)	Recurring health system problems	Open-ended
	Patient behaviours or community practices that puzzle the respondent or affect outcomes (prompts: late presentation, defaulting, traditional remedies)	Behavioural and socio-cultural drivers	Open-ended
C. Research priorities	The one question the Department should fund research to answer	Practitioner-generated research questions	Open-ended
	Areas the agenda should prioritise (up to three of nine, plus "Other")	Thematic priority areas	Multiple choice
D. Research engagement	Previous involvement in research or quality improvement; interest in future research and in what role	Research experience and willingness to collaborate	Yes/No/Maybe; open-ended

Annex 7: Unit and Programme Heads' Research Gap Analysis Tool

Thirteen units and programmes completed the research gap analysis tool. Their gaps, data, trends and research questions are summarised in Table 2.5. Table A7.1 gives the evidence each unit proposed to synthesise first and the actions it suggested. The consolidated workbook (Makueni_Research_Gap_Analysis_Tool_2.xlsx) is held by the Research and Knowledge Management Unit.

Table A7.1: Evidence to synthesise and suggested actions, by unit

Unit or section	Evidence to synthesise first	Suggested actions
Reproductive health	MPDSR reports; EmONC training and mentorship database; facility readiness reports; maternal and neonatal outcomes; QI and referral data	Synthesise MPDSR data; assess the training-to-practice gap; assess facility readiness; map the emergency-care pathway; review implementation of MPDSR recommendations; develop and pilot a third-delay reduction package
NCD services	KHIS NCD indicators; facility NCD registers; CHP screening and referral data (eCHIS); stock-out reports; Kenya STEPS and KDHS 2022; evidence on CHP-led and task-shifted care in sub-Saharan Africa	Build a hypertension and diabetes care-cascade dashboard from eCHIS and KHIS; track CHP referrals to confirm linkage; monitor NCD medicine availability at Level 2–3 facilities monthly
Oncology services	Cancer morbidity and mortality data; distribution of cancers; loss to follow-up; referrals	Collect and analyse data on cancer morbidity, mortality and distribution
TB and lung health	Notification trends 2018–2025; national benchmarks; diagnostic capacity and GeneXpert coverage; supply chain and preventive therapy data; community indicators; funding and staffing trends	Strengthen diagnostic coverage and the sample referral network; scale up community awareness and contact management; secure sustainable financing for TB services
HIV services	Individual, caregiver and health-system determinants of viral load uptake and suppression (limited county evidence)	Targeted viral load monitoring through adherence counselling and routine tracking; build health-worker capacity; address facility-level barriers
Antimicrobial resistance	Microbiology data on resistance patterns of priority pathogens across human, animal and environmental health	Collect and collate data on priority pathogens with One Health (quadrupartite) partners
Nutrition services	Existing health and nutrition surveys	Build the capacity of CHPs and health workers to support infant and young child nutrition; collect and analyse feeding data; engage stakeholders on the findings
Health records and information	Data use by partners and donor-funded organisations	Establish the level of data use for decision-making among health workers and managers
Health informatics	Patient records; waiting and laboratory turnaround times; medication errors; adherence to guidelines; referral completion; patient satisfaction; staff experience	Compare quality across facility levels, accounting for differences in system use; identify improvements and gaps; use findings to strengthen clinical workflows

Unit or section	Evidence to synthesise first	Suggested actions
Laboratory diagnostic services	Infrastructure, equipment, staffing, commodities, test use, quality systems, referral networks, turnaround times and the effect of diagnostic delays on care	Map diagnostic gaps; strengthen Level 2–3 laboratories; improve staffing and commodities; expand point-of-care and molecular testing; strengthen referrals, maintenance and quality systems
Director of Health	Duty rosters; staff placement and distribution; absenteeism; activity registers	Audit staff deployment and hours of work
Quality improvement	What works, where and why, at what cost, and whether it can be replicated across Makeni	Move from isolated QI projects to a county-wide learning, evidence and scale-up system
Public health and disease surveillance	Progress of the community-led total sanitation process in villages not yet open defecation free	Implement community-led total sanitation across the county

Annex 8: Costed Work Plan

Table A8.1 sets out the activities under each strategic objective and their estimated cost by financial year. Activities marked "Yes" in the "No cost" column are boardroom activities that need no expenditure. The unit rates are in Table A8.2. The work plan is maintained as an Excel workbook by the Research and Knowledge Management Unit and updated each year with the annual work plan.

Table A8.1: Costed work plan by strategic objective and activity, 2026/27–2029/30 (KSh)

Objective and activity	No cost	2026/27	2027/28	2028/29	2029/30	Total
1. Strengthen research governance and coordination		1,365,000	819,000	819,000	819,000	3,822,000
Designate the Research and KM Unit, its head and staff	Yes	–	–	–	–	–
Appoint members of the County Health Research Committee and the Research Ethics and Compliance Committee; adopt terms of reference; members sign conflict-of-interest declarations	Yes	–	–	–	–	–
Hold monthly committee meetings	No	409,500	546,000	546,000	546,000	2,047,500
NACOSTI Research Integrity and Ethics Training for ethics committee members	No	955,500	273,000	273,000	273,000	1,774,500
Develop SOPs for research approvals and partner engagement	Yes	–	–	–	–	–
2. Build internal capacity for research and data management		285,000	285,000	285,000	285,000	1,140,000
Train managers and frontline staff in research methods, ethics, data analysis and scientific writing	No	285,000	285,000	285,000	285,000	1,140,000
Develop mentorship cohorts linked to the trainees	Yes	–	–	–	–	–
3. Institutionalize facility and sub-county research structures		198,000	–	–	–	198,000
Nominate research focal persons and orient them	No	198,000	–	–	–	198,000

Objective and activity	No cost	2026/27	2027/28	2028/29	2029/30	Total
Establish hospital and sub-county research committees	Yes	-	-	-	-	-
Link CQI with operational research	Yes	-	-	-	-	-
4. Establish a health research and data repository		-	-	-	-	-
Design the repository and research inventory; catalogue reports, abstracts, protocols, publications, dataset metadata and policy briefs; define access levels	Yes	-	-	-	-	-
5. Strengthen evidence-to-policy and CQI translation		-	-	-	-	-
Hold quarterly data review and research translation meetings, and integrate findings into annual work plans and budgets	Yes	-	-	-	-	-
Produce policy briefs	Yes	-	-	-	-	-
Disseminate study findings to staff of the participating facility through existing CME sessions	Yes	-	-	-	-	-
Track study recommendations and actions in the digital dashboard; review quarterly at the CHMT	Yes	-	-	-	-	-
6. Increase visibility, publication and resource mobilisation		4,017,500	4,017,500	4,017,500	4,017,500	16,070,000
Institutionalize the county scientific conference: Department-sponsored participants, printing and speaker tokens	No	2,450,000	2,450,000	2,450,000	2,450,000	9,800,000
Scientific conference: participants sponsored by sub-county hospitals	No	1,320,000	1,320,000	1,320,000	1,320,000	5,280,000
Support manuscript writing	No	247,500	247,500	247,500	247,500	990,000
Develop a grants calendar and partner with universities	Yes	-	-	-	-	-
7. Promote smart advocacy and digital health innovation		-	-	-	-	-

Objective and activity	No cost	2026/27	2027/28	2028/29	2029/30	Total
Develop dashboards, infographics, GIS maps and executive briefs	Yes	-	-	-	-	-
Pilot AI-supported analytics and telemedicine use cases	Yes	-	-	-	-	-
8. Deliver priority (Tier 1) research		247,500	-	-	-	247,500
Develop a short research plan for each Tier 1 theme	No	247,500	-	-	-	247,500
Develop micro-grant proposals and commission or co-implement priority studies with partners, including ethics approvals	Yes	-	-	-	-	-
9. Secure sustainable research financing		-	-	-	-	-
Cost the agenda and include a research budget line in the ADP and annual budget; develop a joint resource mobilisation plan with partners	Yes	-	-	-	-	-
10. Strengthen ethics, data governance and community engagement		337,500	365,000	90,000	90,000	882,500
Adopt a county policy on data ownership, sharing, authorship and benefit sharing	No	247,500	-	-	-	247,500
Accreditation of the Research Ethics and Compliance Committee by NACOSTI	No	-	275,000	-	-	275,000
Establish community and patient input into priorities and dissemination	No	90,000	90,000	90,000	90,000	360,000
Total, all sources		6,450,500	5,486,500	5,211,500	5,211,500	22,360,000
Of which: sub-county hospitals (conference participants)		1,320,000	1,320,000	1,320,000	1,320,000	5,280,000
Department of Health Services		5,130,500	4,166,500	3,891,500	3,891,500	17,080,000

Table A8.2: Unit rates and assumptions used in the costed work plan

Item	Rate or assumption	Source
Committee sitting allowance	KSh 3,000 per member per sitting; refreshments KSh 500; 13 members; monthly sittings	Department
Training of health workers	30 participants and 10 trainers, 3 days; lunch KSh 1,500 (participants) and KSh 2,000 (trainers); refreshments KSh 500 per person per day; fuel 40 litres a day at KSh 250	Department
Writesshops and orientation	Same rates as training: writeshops 30 participants, 5 facilitators, 3 days; focal-person orientation 32 participants, 10 trainers, 2 days	Department
Scientific conference	200 Department-sponsored participants; 6 sub-county hospitals sponsor at least 20 each; registration KSh 5,000 and KSh 3,000 per day for 2 days; printing KSh 150,000; MC, keynote and panellist tokens KSh 100,000	Department
NACOSTI Research Integrity and Ethics Training	KSh 65,000 per person (5-day residential, VAT inclusive), transport KSh 1,500 and per diem KSh 14,000 a day; 7 ethics committee members in 2026/27, then 2 a year	NACOSTI [87]; Department
Ethics committee accreditation	One-off NACOSTI application fee KSh 275,000; accreditation valid three years	NACOSTI guidelines, 2021 [88]
Community dialogues	One per sub-county a year; 30 participants; refreshments KSh 500	Department

Annex 9: Research and Academic Partner Institutions

Table A9.1 lists the research and training institutions with which the County collaborates or plans to collaborate (Table 8.4). Each has an approved memorandum of understanding with the Department.

Table A9.1: Research and academic partner institutions

Institution	Type	Current or planned collaboration	Agreement (MOU) status
KEMRI	National research institute	HPV study with the county; technical support to this agenda	Approved
KEMRI-Wellcome Trust Research Programme	Research programme	Research and training collaboration under the MOU	Approved
KEMRI Graduate School	Graduate school	Postgraduate research and supervision	Approved
Jomo Kenyatta University of Agriculture and Technology (JKUAT)	Public university	Technical support to this agenda; peer review	Approved
Daystar University	Private university	Technical support to this agenda; peer review	Approved
Aga Khan University (AKU)	Private university	Peer review of this agenda	Approved
Kenyatta University	Public university	Research and training collaboration under the MOU	Approved
University of Nairobi	Public university	Research and training collaboration under the MOU	Approved
South Eastern Kenya University (SEKU)	Public university	Research and training collaboration under the MOU	Approved
Open University of Kenya	Public university	Research and training collaboration under the MOU	Approved
University of Kabianga	Public university	Research and training collaboration under the MOU	Approved
Lukenya University	Private university	Research and training collaboration under the MOU	Approved
Kibwezi (institution to be confirmed)	To be confirmed	Research and training collaboration under the MOU	Approved
Makueni University (name to be confirmed)	To be confirmed	Research and training collaboration under the MOU	Approved
Kenya Medical Training College (KMTC)	Training college	Student research; training	Approved

Annex 10: Validation Comment Matrix

Table A10.1 summarises the comments received at the validation meeting on 23 October 2026 , during peer review and in the final technical review, and how each was addressed in the revised agenda. Comments that were not adopted are listed with the reason.

Table A10.1: Validation comment matrix

No.	Area	Comment and source	Response and action taken, or reason not adopted	Section
1	Practicability	Validation meeting: are the priorities, timelines and targets practicable?	Confirmed as practicable; start-up actions condensed into six months (row 3).	2.7; 8.2
2	Practicability	Validation meeting: what will implementation cost, and what can be done without new money?	Costed work plan added, with no-cost (boardroom) activities identified, and a financing narrative.	8.4; Annex 8
3	Practicability	Group review: the first year can be condensed to six months.	Adopted; Table 8.1 timelines revised.	Table 8.1
4	Areas of focus	Chief Officer, Health Human Resource Management and Administration; group review: move injuries to Tier 1.	Adopted.	5.2; Table 5.2
5	Areas of focus	Chief Officer, Health Human Resource Management and Administration: injuries could replace AMR.	Not adopted; AMR retained in Tier 1 (national action plan, county focal person, existing surveys, current concern).	5.2; Table 2.7
6	Areas of focus	Nurse: move mental health to Tier 1; study factors behind mental health problems among health workers and the community.	Partly adopted; question added; first candidate for promotion in 2026/27.	5.2; Table 5.4
7	Areas of focus	Counselling Services Coordinator; plenary: include socio-cultural beliefs, norms, attitudes and perceptions.	Adopted as a cross-cutting focus.	5.6; Table 5.6
8	Areas of focus	Group review: barriers to referral to specialised clinics.	Adopted; question added.	Table 5.4
9	Implementation	Group review: name accountable and supporting offices for each objective.	Adopted.	Table 8.1
10	Implementation	Director, Health Products and Technologies: institution-specific dissemination and indicator.	Adopted; CME-based dissemination, recommendations tracker, two indicators.	6.5; 8.1; Table 9.1
11	Financing	Group review: no budget for each tier.	Partly adopted; funding by tier explained.	8.4

No.	Area	Comment and source	Response and action taken, or reason not adopted	Section
12	System strengthening	Validation meeting: governance and administration.	Commitment recorded to appoint the research committees and designate the Unit.	2.7; 6.3
13	System strengthening	Validation meeting: financing, attitude and staff working hours.	Commitments recorded: the research budget line, a positive attitude to research, and protected staff working hours for research.	2.7; 8.4; 8.5
14	Peer review	Dr. Moses Mutua (Aga Khan University): methods, flow and referencing.	Addressed; scoping review search details, methods and references strengthened.	2.3; throughout
15	Peer review	Dr. Joseph Kweri (JKUAT) and the Directors of Health (Dr. Benard Kasanga, Dr. James Kanyange, Dr. Stephen Mwatha, Dr. Anthony Mathulu, Christopher Yulu and David Kiuluku).	Comments incorporated during revision.	Throughout
16	Final review	Dr. Eric Chomba Wanjohi: editorial changes, the Chief Officer's title, validation venue, budget allocation as a CHMT role.	Adopted.	Throughout
17	Final review	Is Umanyi the knowledge management module?	Yes; text now describes Umanyi as the county's online knowledge management platform.	3.6
18	Final review	The TOWS sub-section refers back to the SWOT.	Paragraph reworded to link Tables 3.12 and 3.14.	3.6.1
19	Final review	County ADP or departmental AWP?	Both: the Unit's work plan follows the departmental AWP and, through it, the county ADP.	6.2
20	Final review	Does the CHMT include county coordinators and directors?	Yes; defined in the note to Figure 6.1.	6.3

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for a healthy, empowered and resilient Makueni*