

# NAVRONGO

## HEALTH RESEARCH CENTRE

PURSUING EXCELLENCE IN RESEARCH AND INNOVATION



# A Platform for Research

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# EDITORIAL



**T**he story of the Navrongo Health Research Centre (NHRC) illustrates a mustard seed that has thrived by reason of purposeful planting and tending.

It was an uphill task when the NHRC began in an area without electricity and potable water. However, the benefits provided the impetus to rise to the challenge.

The establishment began in 1988 as a field station for the Vitamin A Supplementation Trial (VAST), facilitated by the London School of Hygiene and Tropical Medicine (LSHTM) and the Kwame Nkrumah University of Science of Technology (KNUST).

After the Vitamin A Trial in 1992, the Ministry of Health upgraded the field station to a health research centre, which is still running well over 30 years.

The three centres of the Research and Development

Division of the Ghana Health Service are firmly rooted in the NHRC because the products of Navrongo established the Kintampo Health Research Centre (KHRC) and the Dodowa Health Research Centre (DHRC).

The trailblazers from NHRC are among the top 15 scientists in Ghana and have led research institutions at the University of Ghana (UG), University for Development Studies (UDS) and the University of Health and Allied Sciences (UHAS), to name a few. NHRC has been a key player in malaria control, and duly recognised by the National Malaria Elimination Programme (NMEP) and international partners, as a pioneer in the fight to eliminate malaria in Ghana.

Among the many achievements of the NHRC, is the community health and planning services (CHPS) concept, putting nurses right within the community, and bringing primary health care to dispersed settlements where people are reluctant to attend health centres because of the distance. The Navrongo CHPS model was copied across Africa as an ingenious solution to save lives at the community level.

By dint of hard work, the NHRC has created a research environment for which Ghana has been recognised as a global centre.

The Centre trained indigenes to take up positions, develop their research career and solve the difficulty in getting professionals to relocate there.

Above all, the NHRC has demonstrated what could be achieved with more resources for research and development.



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# A PLATFORM FOR RESEARCH

By Eunice Menka

**T**he Navrongo Health Research Centre (NHRC) began modestly in 1988 as a field site to investigate the impact of repeated large doses of Vitamin A supplementation on child survival, in the Kassena-Nankana district of Upper East region. This project, known as the Ghana VAST, paid off and added to child health interventions.

Today, the NHRC is a leading research institution in Africa, recognised globally as a centre of excellence. The Centre is credited for the development of the Community-based Health Planning and Services (CHPS) concept.

The story of NHRC started with the selection of Navrongo, a remote town to undertake the Vitamin A

Supplementation Trials (VAST. The project was funded by the British Overseas Development Agency (ODA), through the London School of Hygiene and Tropical Medicine (LSHTM).

Since gaining the status of a research centre under the Ministry of Health in 1992, the NHRC has spread its wings, conducting research into major health problems, including malaria vaccines, non-communicable diseases and sickle cell disease.

As a pioneer health research centre of the Ghana Health Service, it is strategically developing more African Scientists and building structures and systems to deliver demographic and health research in and outside Ghana.

The outbreak of the COVID-19 pandemic in 2020 was an opportunity for the Centre to show leadership by successfully carrying out clinical trials on COVID-19 vaccines that are now in use.

**Strategic approach to research**  
The strength of the NHRC lies in its ability to blend clinical trials, social and demographic research. Some of the current projects being undertaken are the study on serological survey from of measles antibodies in infants of 4 months and 9 months of age, born in Ghana.

Another project is the Epidemiological Surveillance of Streptococcus Pneumonia among children, post-implementation of the 13 Valent Conjugate Vaccine in the Kassena-



Nankana districts of Ghana. This project aims at determining the antibiotic susceptibility profile of the isolated streptococcus pneumonia.

The Malaria Vaccine Project Evaluation is underway to estimate the effect of the routine delivery of RTS,S/ASo1 on all-cause mortality in children aged 5 to 39 months. It will estimate the gender-specific effect of RTS,S/ASo1 on all-cause child mortality.

The Centre has conducted a malaria reservoir study to monitor the impact of malaria control interventions on the reservoir of plasmodium falciparum in the Bongo district.

The Centre has been involved in an international multisite clinical trial to evaluate efficacy, immunogenicity and safety of the Sputnik Light Vector vaccine in adults, in the SARS-CoV-2 infection prophylactic treatment.

Another key project is the Phase III multi-stage parallel-group study, to assess the efficacy, safety, and immunogenicity of two SARS-CoV-2 Adjuvanted Recombinant Protein Vaccine (monovalent and bivalent) for prevention of COVID-19 in adults.

**Strategic Investments**

The NHRC's human and infrastructural development strategy since 2012 has yielded a high-calibre clinical trials centre.

There are new structures which include a central biomedical research laboratory, administration block, a clinical trials archive and an education block, with a library and common room for junior staff and students.

The Centre takes the welfare of staff seriously, as can be seen in a new welfare building which houses a clinic, a common room, a commercial centre and a fitness centre for staff.

Between 2014 and 2021, there was procurement of a number of capital

equipment, including an electricity generating plant and step-down transformer, for reliable power supply.

The NHRC has a state-of-the-art conference centre to help in communicating research findings globally. New servers and fibre-optic internet link have been installed to ensure the Centre remains connected to the rest of the world.

dozen diploma and first-degree studies, between 2016 and 2022.

Those who have also been supported to upgrade their skills include microscopists, who have acquired diplomas to become technologists and data entry staff.

Whilst some staff have taken study leave to pursue their programmes, others are undertaking sandwich programmes, making it possible for



*New Transformer*



*Wellness and Fitness Centre*

The era of change brought good fortune to the human resource base of the NHRC. The Centre has given direct support to over 50 staff members for various capacity building programmes. These include over 15 PhD programmes, 30 Master's degree programmes and about a

them to work and study. Trainings are staggered, allowing a small number of staff to be away at a time, to ensure that the specific needs of the various projects are not compromised and the Centre does not suffer staff shortage.





New staff welfare bus

**Partnerships and Collaborations**

The NHRC attributes its success to local and international partnerships. Locally, the NHRC has been collaborating with the Kintampo and the Dodowa Health Research Centres, Kumasi Centre for Collaborative Research (KCCR) and the Noguchi Memorial Institute for Medical Research (NMIMR).

The local community in the Upper East region, including traditional

rulers, have been very supportive through their participation in the research activities of the Centre.

Newly-constructed maintenance workshop

Other collaborators and partners of the Centre include Sanofi Aventis Recherche & Développement, University of Oxford, London School of Hygiene and Tropical Medicine.

Pfizer Incorporated, Georgetown University, the Arnold Institute for Global Health in the Ichan School of Medicine Mt. Sinai, the University of North Carolina, the University of California San Francisco, the University of Michigan, Hull University and the University of North Carolina, are among the list of partners.



Newly-constructed maintenance workshop





# Swift Response to COVID-19

By Clement Minyila

**T**he Navrongo Health Research Centre (NHRC) responded quickly when the World Health Organization (WHO) declared the COVID-19 outbreak as a global health emergency, in January 2020. The response was soon after the first regional meeting of stakeholders in the Upper East on the outbreak of the disease.

There was pressure to devise realistic ways to tackle the threat when Ghana reported its first two cases on 12th March 2020, a day after the WHO declared COVID-19 as a pandemic.

The Centre had to suspend some of its operations to respond to this national duty, as personnel braced up to help Ghana win the fight.

## The NHRC Response

After successfully mapping out the municipality and monitoring the response to the disease, the Centre

provided two fuelled pick-up trucks with accompanying drivers, to support the education drive and contact tracing for suspected cases in the Kassena-Nankana area.

The NHRC provided funds to set up a holding centre for suspected coronavirus cases, and procure logistics, including personal

protection equipment (PPE), for case management and treatment at the War Memorial Hospital in Navrongo.

The Centre held weekly meetings with the management of the hospital to review and update the preparedness for the pandemic. It partnered the Regional Health Directorate to

train the district COVID-19 teams.

The Centre provided technical advice on disease control and surveillance to the Health Team and the Rapid Response Team of the Kassena-Nankana Municipality.

In April 2020 a team from the Kumasi Centre for Collaborative Research (KCCR), a leading COVID-

*“...In response, the NHRC retooled the clinical laboratory as a facility for COVID-19 testing.”*

19 testing centre, visited Navrongo to train staff to conduct COVID-19 tests.

At the height of the pandemic, there was the need for more testing centres throughout the country. In response, the NHRC retooled the clinical laboratory as a facility for COVID-19 testing.

Following the retooling of the laboratory, new diagnostic machines for coronavirus were procured. The new machines included a new Real-Time PCR machine, which is the main tool used worldwide to diagnose COVID-19 infection. The equipment arrived just in time for the lockdown.

A biosafety containment level II cabinet was installed, to ensure the safety of laboratory staff handling the virus. As a matter of a national priority, the Centre pooled

samples per day from all the sites. Testing was conducted on time and results released to the appropriate quarters for further action.

Another critical role played by the NHRC in the fight against Coronavirus, was conducting COVID-19 vaccine trials. The Centre conducted two major vaccine trials to support the treatment of the disease.

The trials included a Phase III, randomized, double-blind, placebo-controlled international

19, in adults of 18 years and above. The Sputnik Light vaccine has since been approved for use as a safe and effective stand-alone one-shot vaccine, and a booster, against covid-19. Data available from the study indicated that the vaccine has over 80% efficacy against infection whilst efficacy against hospitalisation and severe disease is higher.

### **Mixed bag of lessons**

The COVID-19 pandemic has presented a mixed bag of lessons and experiences for policy makers,

***“In respect of national capacity for testing across the country, the pandemic has improved the ability of laboratories to test for diseases, using complex equipment.”***



resources and expertise to support the national fight against the pandemic.

After capacity-building for COVID-19 testing, the system was validated for the Centre to commence testing.

### **Key achievements**

The Centre received samples from the Upper East, North East and Upper West regions of the country. At the peak of the pandemic, the facility received more than 400

clinical trial in parallel assignment to evaluate efficacy, immunogenicity and safety of the Sputnik Light vaccine in adults, in the SARS-CoV-2 infection prophylactic treatment.

Another trial of importance is the Phase III, multi-stage, modified double-blind, multi-armed study to assess the efficacy, safety, and immunogenicity of two SARS-CoV-2 adjuvanted recombinant protein vaccine (monovalent and bivalent) for preventing COVID-

the health sector and the general public. In respect of national capacity for testing across the country, the pandemic has improved the ability of laboratories to test for diseases, using complex equipment.

For example, most laboratories can now test for COVID using the Gene Xpert machine. There is, however, the need to improve the country's capacity to handle similar outbreaks and pandemics in the future.



# Lassa fever vaccine trial on humans

The fight against the dreaded Lassa fever has gone up a notch with clinical studies of a vaccine on humans.

The project at the Navrongo Health Research Centre (NHRC) comes after the testing of the vaccine on animals were found to be safe.

Dr Nana Akosua Ansah, Head of the Clinical Science Department of the

Speaking to journalists from the African Media and Malaria Research Network (AMMREN), Dr. Ansah said issues around ethical clearance from the Food and Drugs Authority (FDA), are being dealt with.

She gave the assurance that good clinical practices are being adhered to, in addition to lining up highly-skilled staff and specialists to screen

Lassa fever is a zoonotic disease associated with acute and potentially fatal illness caused by Lassa virus.

The viral haemorrhagic fever has symptoms similar to the Ebola virus disease.

The World Health Organisation (WHO) has listed Lassa fever as one of the epidemic threats needing urgent research and development.

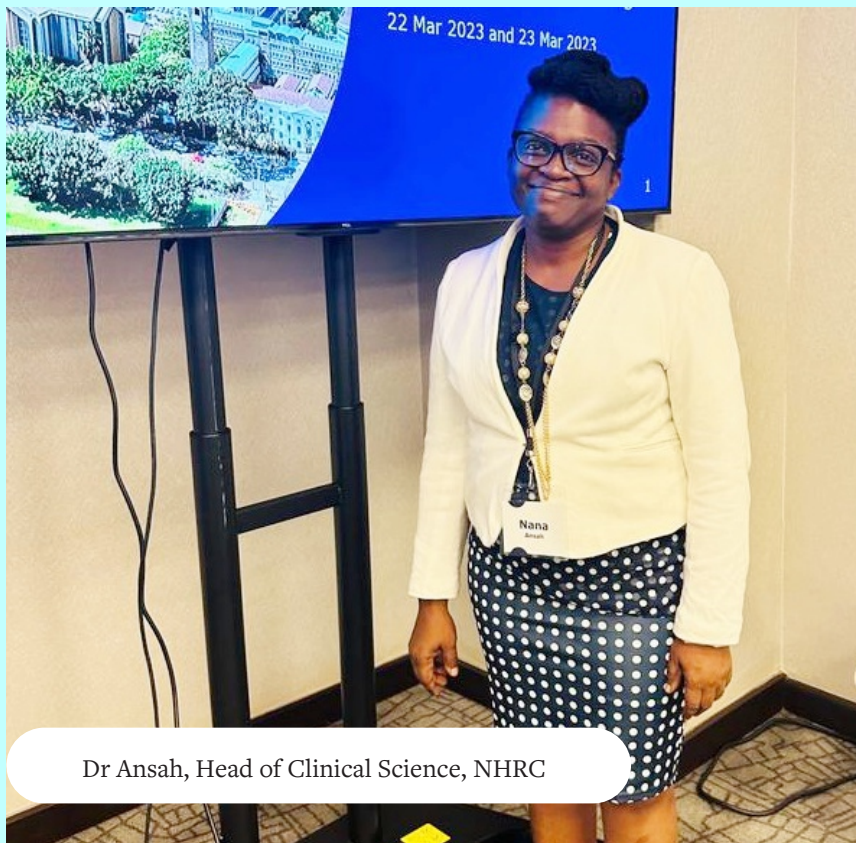
It is therefore timely that the NHRC is taking action with a clinical trial on the Lassa fever vaccine to gather sufficient and reliable data on it.

According to the WHO, the disease became known around 1969 when two missionary nurses became ill and died in the town of Lassa, Nigeria.

“Since then, Lassa fever has been shown to be prevalent in many West African countries, such as Benin, Ghana, Guinea, Liberia, Mali, Nigeria, and Sierra Leone. In these countries, both sporadic cases and prolonged outbreaks of the disease are observed,” the WHO adds.

The Lassa virus is transmitted to humans via contact with food or household items contaminated with rodent urine or faeces.

Person-to-person infections and laboratory transmission can also occur, particularly in hospitals lacking adequate infection prevention and control measures.



Dr Ansah, Head of Clinical Science, NHRC

NHRC, explained that as a safety study, the Lassa fever vaccine trial would recruit only 108 people.

The first eight months would entail vaccination and follow up, and nine months dedicated to general follow up.

the study participants, to take care of those who may suffer from any reaction.

She said the FDA inspected the NHRC trial site to ensure the readiness to commence.

# A LEAP out of Poverty

By Benedicta Gyimaah Folley

The Navrongo Health Research Centre (NHRC) is studying the Livelihood Empowerment Against Poverty (LEAP) programme to identify gaps that could be addressed to improve its implementation.

The government's social intervention which began in 2008 to support the extremely poor and vulnerable, has benefitted 1,827,035 individuals as of September 2022.

The LEAP integrated social services programme, being managed by the

afford daily meals for her children. Two of her children dropped out of school. She took a loan and went into farming. But that farm was wiped out by a rainstorm.

"I was at the lowest point of life when I was selected for the LEAP, which gave beneficiaries GHC 41.75 per household," she said.

That was before the value of the grant was upwardly adjusted to GHC95.19 bi-monthly payments per household.

for the evaluation of the LEAP plus Integrated Social Services (LEAP+ISS) pilot at the Centre, said the programme was being implemented by a consortium that includes researchers from the Institute of Statistical, Social and Economic Research (ISSER) at the University of Ghana and the Carolina Population Institute at the University of North Carolina (UNC), Chapel Hill.

He said, for the consortium to better contextualise the processes and mechanisms impacting the LEAP



LEAP beneficiary receiving payment. Credit: Ministry of Gender, Children and Social Protection

Ministry of Gender and Social Protection, provides cash payments to extremely poor households that have at least one member who is elderly or living with a disability, orphaned or vulnerable children, pregnant women or children under five years

LEAP has been a lifesaver for people like 45-year-old Memuna Akologo, widow of five children living in Navrongo, capital of the Kassena-Nankana District in the Upper East Region of Ghana.

Since 2020 when she lost her husband to COVID-19, things have been difficult for her to the extent that she could barely

For Memuna, the money from LEAP and assistance from relatives and friends eased her financial burden, enabling her to start something new to help raise her children.

Her story is just one of the touching narratives in her community, reflecting the impact of LEAP, and how it has been assessed by beneficiaries.

LEAP beneficiary receiving payment. Credit: Ministry of Gender, Children and Social Protection

#### Informed opinion

Dr Raymond Aborigo, lead investigator

programme, the Centre adopted an embedded mixed-method approach to obtain multiple perspectives on the different dimensions of impact that cannot be obtained from one method alone.

The approach, he explained, used both quantitative and qualitative approaches to data collection to address distinct aspects of the complex LEAP programme, by quantitatively measuring outcomes and qualitatively assessing pathways of influence and operational processes.

"The NHRC designed the qualitative



component in collaboration with the UNC but the field work was implemented by the NHRC.”

“Our field staff visited our sampled communities in the Tolon and Kumbungu Districts in the Northern Region, Afigya Kwabre South District and Asokore Mampong Municipal Assembly in the Ashanti Region, as well as the Adentan and the La-Nkwantanang Municipal Assemblies in the Greater Accra Region.

We used the qualitative case study approach to conduct in-depth interviews with LEAP beneficiaries and programme leaders, and focus group discussions with frontline social sector workers, to help us characterise the intervention on the ground.” Dr Aborigo explained.

Touching on the findings of the study, he said the impact of LEAP on beneficiary households was limited by the size of the cash transfers.

The amount, he indicated, was not enough to achieve impact beyond survival and food security. He added that delays in receiving the transfer also limited impact, leaving beneficiaries unable to plan how to invest their share of the transfer.

Dr Aborigo noted that although beneficiaries generally appreciated being covered by the national health insurance scheme (NHIS) and the fees for the annual renewal of cards, the card holders appeared to receive lower quality of care.

He said support from LEAP was targeted at very poor households with the hope of lifting them out of poverty and empowering them to take care of their basic needs, since beneficiaries use the cash to improve their nutrition, pay school fees, buy clothing for their children and meet other social obligations such as funeral contributions.

“The impact of LEAP is focused on food security and acute stress relief, but not sustainable change or economic empowerment. The integrated social services (ISS) initiative improved access to social services at little or no cost to LEAP beneficiaries,” he pointed out.

He said the LEAP programme had a huge potential to reduce poverty because the programme targeted the very poor and linked them to social services that they either receive for free or at minimal cost. “The transfer amount must be increased

and the scope widened to accommodate more vulnerable people. Also, beneficiaries must be equipped with vocational and investment skills and the list of social services within the ISS programme expanded and linkages strengthened. This will significantly reduce poverty in the country,” said Dr Aborigo.

“Throughout the data collection, respondents complained about the size of the transfer amount and the lack of periodic adjustments to reflect prevailing economic conditions, with some participants suggesting that whenever salaries of workers rise, the transfer amount must be adjusted upwards for more impact.”

Dr Aborigo said inflation affected the real

**“The impact of LEAP is focused on food security and acute stress relief, but not sustainable change or economic empowerment. The integrated social services (ISS) initiative improved access to social services at little or no cost to LEAP beneficiaries,”**

value of the cash, which meant that overtime, what beneficiaries could do with their money, would be of lower value.

According to him, as part of the ISS approach, NHIS moves into communities to register beneficiary households and renew their cards and clarified that NHIS had become one of the key partners for the ISS programme at the district level.

“In terms of honouring the proposed waiver of payment, the NHIS supported the LEAP programme because “field staff move into communities to register the beneficiary households and renew their cards. They pay GH¢8 for the replacement of a lost card, but this applies to

only the Northern and Ashanti regions.”

“Although beneficiaries are not supposed to pay for replacement of cards, this was only implemented in the Greater Accra Region. This was because the electronic system had not been re-programmed to reflect the waiver and therefore, NHIS staff elsewhere feared to skip the payment whenever it pops up on their screens,” he lamented.

The research revealed little engagement between beneficiaries and social welfare services, although there was goodwill towards integration and linkages across sectors involved in the ISS programme.

“Despite the goodwill, social welfare services lacked resources to facilitate linkages since bureaucracy within and across sectors limited effective coordination between the partners. Therefore, more resources are needed not only for the increment of the transfer size but to resource the Department of Social Welfare to better coordinate the linkages between social services in the districts.”

“The government must acknowledge the key role of the Community Focal Persons who are the link between the partner agencies and the beneficiaries in the communities and explore ways to regularise their role within the national youth employment programme. This will ensure their effectiveness and sustainability,” Dr Aborigo suggested.

ISSER and the University of North Carolina (UNC), partnered NHRC in 2015 to evaluate the impact of LEAP 1000, a pilot cash transfer programme. Since then, the three institutions have worked on several research projects including the recent baseline evaluation of the LEAP and ISS programme.

The NHRC, ISSER and the UNC Population Center belong to a multi-country collaborative network of cash transfer research initiative called “The Transfer Project”. The network is a thought leader on cash transfers in Africa which goes beyond measuring typical economic outcomes to find out if and how cash transfers impact other aspects of people's lives.

If the informed opinion of the experts and research findings are taken on board, beneficiaries like Memuna Akologo can really take a leap out of poverty.

# A GUIDE TO GENOMIC RESEARCH

By Godfred A. Polkuu

In the quest to offer tailored treatment, researchers analyse genetic data to identify disorders, and diagnose rare diseases accurately, to predict the response to different treatments. This is premised on the knowledge that about 80% of all rare diseases are genetic in origin.

To that purpose the Navrongo Health Research Centre (NHRC) has done a community engagement in Biobanks and

Dr. Raymond Aborigo, Head of Social Science and Public Health at the NHRC, said it would enable researchers to share data with communities and individuals.

He said preliminary analysis indicated that community members preferred aggregate genomic data to be shared at gatherings such as durbars.

“Some folks prefer their genomic results shared with them privately or in the

“What is usually shared are risk factors for cardiovascular diseases rather than the genomic results, because analysis of genomic data takes a protracted period to complete, and the CEBioGen project seeks to provide guidance to researchers to share those results anytime they become available,” he said.

Dr. Aborigo, who also heads the Research Coordination Unit of the NHRC, disclosed that interviews with the genomic researchers suggest it would be a huge challenge to share individual genomic results with participants.

“This is difficult because of the uncertainty around the level of risk of the individual to develop the condition, and even if they want to share the individual genetic results, the system currently does not have trained genetic counsellors to counsel participants appropriately.”

“There are knowledge gaps identified in community engagement strategies, because they focused more on community entry for study initiation and recruitment,” said Dr. Aborigo.

He said research institutions in Africa are getting more involved in complex research which current community engagement strategies are not robust enough to handle.

“For instance, we lack guidance on community engagement strategies that support broad sharing of data and samples and the return of both individual genetic findings and aggregate genomic results to communities and groups.

“Our study was therefore designed to address that knowledge gap, and to build the capacity of community engagement



*Dr. Raymond Aborigo, Head of Social Science and Public Health at the NHRC*

Genomics (CEBioGen), to address the knowledge gaps in the strategies for community engagement.

Explaining the significance of the project,

presence of a trusted relative, by a medical doctor who would tell them how to manage their conditions or prevent them from developing the disease despite having risk factors.”



*“The unique feature of this consortium is that it is led by African scientists for African people...”*

practitioners who can support the implementation of genomic and biobanking projects on the African continent,” Dr. Aborigo said.

He touched on the Human Heredity and Health in Africa (H3Africa) programme, and explained that it was an initiative of 51 African projects, with population-based genomic studies for non-communicable disorders such as heart and renal diseases and communicable diseases such as tuberculosis.

“The unique feature of this consortium is that it is led by African scientists for African people. The main aim is to facilitate research into diseases on the African continent while developing infrastructure, resources, training and ethical guidelines to support a sustainable African research enterprise,” he said.

Asked why Ghana, Nigeria, South Africa, Tanzania and Kenya were selected for the CEBioGen study, Dr. Aborigo said the study was designed to use the H3Africa AWI-Gen project infrastructure and research programme as a case study.

“This meant that we could only implement the study in countries that were

involved in the AWI-GEN study, which were Ghana, Nigeria, South Africa, Tanzania and Kenya.”

Dr. Aborigo added that the CEBioGen project involved two projects but NHRC participated in only one.

“The aspect of the project which involved NHRC, identified innovative methods of community engagement that could support the return of aggregate genomic results to groups and communities across three research settings in Africa, namely, Navrongo in Ghana, Agincourt in South Africa and Nairobi in Kenya.

Speaking on advantages of a resource centre for ethics and community engagement for genomic research, Dr Aborigo said it would provide a platform for sustained capacity building of community engagement professionals locally and internationally.

He said such professionals would support the increasing genomic research carried out across Africa.

“It will attract funding to expand our current research to improve on our

models and develop new tools for community engagement especially as it pertains to genomic and other complex research within the region.”

Dr Aborigo disclosed that the CEBioGen study showed that communities preferred engagement processes that respected the traditional hierarchy before contacting the individuals, adding that community durbars were seen as effective tools for engaging communities for successful implementation of genomic and other biomedical studies.

“They are also acceptable mediums for sharing aggregate genomic research findings to communities and groups. At the individual level, the risk of being stigmatised by community members, makes them prefer that their genomic data be shared with them either privately or in the presence of a trusted relative.”

“The study had different models and tools for engaging communities, depending on the nature of the research and the target populations. Some innovative ideas include the use of animation, documentaries, infographics, and comic books for dissemination of complex results,” Dr Aborigo said.

*“There are knowledge gaps identified in community engagement strategies, because they focused more on community entry for study initiation and recruitment,” - Dr. Aborigo.*





# A STUDY ON Malaria VACCINE UPTAKE

*By Doreen Ampofo*

The first successful malaria vaccine, RTS,S/AS01E has been studied closely at various stages of its development to ascertain the adverse events, evaluate its safety, effectiveness and impact on young children in Sub-Saharan Africa.

The Navrongo Health Research Centre (NHRC) and counterparts in Kenya and Malawi ran these epidemiological studies to address the lack of data, which was the reality before the introduction of the malaria vaccine.

Most of the affected countries had no baseline incidence data on rare diseases that may be reported as adverse events following vaccination. The diseases include meningitis, cerebral malaria, and other effects that may lead to hospitalisation, or death.

The lack of baseline data made it difficult to understand diseases that may be detected in persons who take the vaccine.

The epidemiological study also aimed at estimating malaria parasite prevalence in humans, and recording the use of malaria control measures in the coverage area.

The research work was grouped into EPI-MAL-002, EPI-MAL-003 and EPI-MAL-005 respectively.

The aspect on adverse events leading to hospitalisation or death, and of meningitis in infants and young children, was termed EPI-MAL-002. It was carried out prior to the implementation of the RTS,S candidate vaccine to help estimate the incidence of diseases specified as adverse events, and diseases of special interest.

The EPI-MAL-003 study focused on safety, effectiveness and impact of the RTS,S vaccine in young children in Sub-Saharan Africa.

EPI-MAL-005 ran parallel with the 002 and 003 studies, enrolling from the same HDSS populations.

The primary objective of this study is “to produce longitudinal estimates of parasite prevalence in humans, and record malaria control measure usage in areas where EPI-MAL-002 and EPI-MAL-003 studies are taking place.

The epidemiological study estimated the incidence of diseases specified as adverse events of special interest (AESI) and assessed the malaria burden as well as the incidence of other childhood illnesses before the introduction of the RTS,S vaccine, among children in sub-Saharan Africa.

Comparison of this data with those obtained after the vaccine introduction, will allow health authorities to estimate the effect and the safety of RTS,S in the future.

It will also provide epidemiological data on diseases such as anaemia, gastroenteritis, respiratory infections, and sepsis in regions where this information is limited or missing. Head of the Clinical Science Department at the NHRC, Dr. Nana Akosua Ansah, explained that the study which began in 2016, was a pre-licensure study intended primarily as a surveillance study to collect background incidence rates of protocol-defined events of special interest.

She said approximately 45,000 children





## *EPI-MAL researchers receive pharmacovigilance training*

in the three selected countries were recruited within the collaborating study sites, and enrolled in active surveillance.

“Out of the 2,843 children recruited in Navrongo, 1880 of them were between six and twelve weeks old, while 963 children were between five and seven months old. The centre recruited children under 5 years in the Navrongo and Builsa health and demographic surveillance areas, representing Kassena-Nankana Municipal area and the West. The intervention was controlled by Builsa North and South districts.”

Dr. Anshah pointed out that the children were actively followed up through home visits, outpatient visits and hospitalisation at all health care facilities in the study

650,000 children.

### EPI-MAL-002

Various events, activities and findings have taken place under the various EPI-MAL studies.

For instance, in the EPI-MAL-002, over the last five years, two adverse events of special interests, were diagnosed in participants between the 5-17-month-old group. One of them was a case of intussusception, where there was an obstruction of the intestine of the baby.

The other was a case of encephalomyelitis occurring outside the at-risk period of 6 weeks. Both led to hospitalization, but neither was fatal.

“It also showed that the vaccine can reduce morbidity and mortality from malaria if deployed, and help free up resources for other health problems.

Mothers of eligible children are encouraged to patronise it when it is rolled out throughout Ghana.”

### EPI-MAL-003

The EPI-MAL-003 study seeks to evaluate the safety, effectiveness, and impact of the RTSS/AS01E vaccine in young children in Sub-Saharan Africa.

The vaccine is administered in a four-dose regimen: three shots in three months, beginning at five months of age, and a fourth booster shot at roughly 18-months old.

In all, 47 districts were selected to pilot the implementation of the vaccine in Ghana, including Navrongo.

So far, about 3842 children have received at least one dose of the RTSS vaccine in Navrongo, and 963 children between the ages of five to 17 months have also received the pentavalent vaccine.

An additional 2009 between the same age brackets were captured during the catch-up. In all 2972 children have received all doses.

The pentavalent vaccine protects a child from five life-threatening diseases – Diphtheria, Pertussis, Tetanus, Hepatitis



*“It also showed that the vaccine can reduce morbidity and mortality from malaria if deployed, and help free up resources for other health problems.*

areas.

The World Health Organisation (WHO), in 2019 piloted the RTS,S vaccine for children from six months up to 2 years of age, in Ghana and other malaria-endemic countries such as Kenya and Malawi.

Three years after the pilot programme, more than 1.7 million doses of the world’s first malaria vaccine were administered in the three countries, benefitting more than

In the 5 to 17 months age group, 392 study participants (5.5%) experienced 802 other events. These were other than meningitis, malaria, or AESI that led to their hospitalisation. The other most frequently reported events were anaemia, gastroenteritis, and lower respiratory tract infection.

Dr. Anshah stated that findings from the EPI-MAL-002 showed that the RTSS was safe with no increased risks of death or meningitis among recipients.

B, and Hib.

The NHRC is assessing findings, particularly on the adverse effects. However initial results indicate that the RTSS vaccine is effective against malaria. According to Dr. Ansah, data after two years of routine vaccination showed that vaccine delivery is feasible.



Dr Ansah, Head of Clinical Science, NHRC

“High uptake indicated strong community demand. Health and economic data showed that the vaccine has the potential for considerable public health impact, averting one death for every 200 fully-vaccinated children.”

Additionally, results from a recent Phase-3 trial conducted in areas with high seasonal malaria transmission, show that using RTS,S in combination with seasonal malaria chemoprevention (SMC), could dramatically drive down the incidence of malaria in high seasonal settings.

The combination reduced malaria deaths and hospitalisation by 70 percent over SMC alone.

The deployment of RTS,S vaccine which started in 2019, is expected to end in 2024.

EPI-MAL-005

Epidemiology study (EPI-MAL-005) is planned to run alongside EPI-MAL-002 and EPI-MAL-003, and conducted at centres in Sub-Saharan Africa participating in EPI-MAL-002 and EPI-MAL-003 studies.

The EPI-MAL-005 is an annual survey to determine malaria intensity and also collect data on other malaria prevention factors. It is carried out during the peak malaria transmission season, at the end of the rainy season in Navrongo, and looks

out for all the species of plasmodium parasites that cause malaria in humans.

According to Dr. Ansah, the intensity would help to determine the vaccine impact on vaccinated and unvaccinated people.

The NHRC joined the fourth EPI-MAL-

005 survey, called Epoch 4, in 2018 and completed the last survey, Epoch 8, in 2021.

The centre has conducted five annual surveys so far. The study recruited 600



subjects who were between 6 months to 10 years of age per survey and per study site, 4200 subjects per survey.

In Navrongo, the first two surveys were done only in the two Kassena-Nankana districts and 600 participants were recruited each year. The next three included the two Builsa districts. This means 1200 were recruited annually.

No vaccines were administered in this study, however, all medications that may influence the presence of malaria

parasites within 14 days before each survey were recorded.

The axillary body temperature of all subjects at the time of the survey was also recorded with blood samples collected for evaluation of malaria.

Dr. Ansah noted that the study has been largely successful, and residents of Navrongo have embraced it.

“Already malaria control measures such as mosquito nets, insecticide sprays, indoor residual spraying (IRS), seasonal malaria chemoprevention, and currently the introduction of the RTSS vaccine have been rolled out in the area. The study recommended advocacy in all malaria control measures such as bed nets, indoor residual spraying and seasonal malaria chemotherapy,” Dr. Ansah explained.

Despite the success of these three studies in the fight against malaria, the last two years have seen more attention diverted to the COVID-19 pandemic.

Dr. Ansah said there is no scientific evidence on its impact on the fight against malaria.

“However, it could be deduced that a lot of funds that could have been invested in these studies and other activities to fight malaria, have been used to fight the COVID pandemic.

Fortunately, Ghana is recording fewer COVID -19 cases now, meaning the government’s focus could go back to malaria.”

Ghana records perennial cases of malaria, the most pronounced seasonal variations being in the northern part of the country. There are two major outbreak patterns, characterised by a 7- month transmission season in the larger part of northern Ghana, and a 4-month transmission in the upper part of the north. The highest number of cases are recorded between July and November.

In the southern part of the country, the transmission season is nine months or more, with a small peak from May to June and a larger peak from October to November. With two percent of global malaria cases and three percent of deaths, Ghana is among the 15 countries in the world with the highest malaria burden.



# NUTRITION FOR HEALTHIER CHILDREN

By Zadok Kwame Gyesi

The Sustainable Development Goal (SDG) to end hunger and malnutrition by 2030, remains a daunting task, because there is not enough food for more than 820 million people living mostly in developing countries, including Ghana.

Out of the estimated five million farmers in Ghana, about 70 percent are smallholder farmers, who rely mostly on traditional methods of farming.

These farmers use stored seeds from previous harvests, which are susceptible to pests and diseases.

Additional problems include poor soil quality, lack of investment capital and

project known as Improved Nutrition Pre-conception, Pregnancy and Post-delivery (INPreP).

The aim was to improve nutrition among pregnant women and children under five years old, as well as adolescent girls in the Navrongo enclave in the Upper East region, by identifying double-duty context-specific nutrition interventions and assisting communities to prioritise how to improve their nutrition, using locally-available staple food crops.

The INPreP project is a multidisciplinary, global nutrition group that draws researchers from Burkina Faso, Ghana, South Africa

formative data gathering, the project assisted beneficiary communities to select the best approaches to improve their nutrition.

“The research team, together with extension officers, developed the nutrition ball game by which the communities selected the interventions they wanted, through consensus. The ball game helped overcome the top-down approach in solving the menace of malnutrition, by finding out the community’s challenges with optimal nutrition, and to better understand what they need to promote optimal nutrition.”



INPreP donates to babies' home

inputs, as well as poor standard agronomic practices, culminating in low crop yields and heavy losses.

The situation actuated experts to advocate for enhanced crop varieties and good agronomic practices to help increase yield and improve the quality of micronutrients such as iron, zinc and carotenoids in the produce.

Against this background, the Navrongo Health Research centre (NHRC) joined other health researchers in Burkina Faso and South Africa, for example, to introduce a

and the National Institute of Health Research, Southampton, UK.

First thousand days

The collaborative research focused on the first 1000 days after birth, assessing the knowledge of communities on what they consider as optimal nutrition, and the interventions needed by communities to improve their nutrition levels, using staple food crops and simple agronomic techniques.

Dr. Engelbert Nonterah, senior epidemiologist at the NHRC, explained that after some

“The project created an ownership of whatever was done. Through the ball game, the communities selected micro-nutrient supplementation and livelihood empowerment activities.”

Based on the interventions the communities preferred, the research team came up with what is termed, “A Food Systems Approach to Research.”

The purpose of the Food Systems Approach to Research, Dr. Nonterah explained, was to help address micro-nutrient deficiency in the implementing communities.



# PHOTO GALLERY



*A compound during the dry season*



*A crocodile at the Paga pond*



*A durbar of chiefs*



*A field worker on his way to a community*



*A Research Officer supervising the conduct of interviews in the field*



*A typical room decoration of the Nankana people of Upper East*



*Community Durbar*



*AMMREN group photo with the Chief (Navropio)*

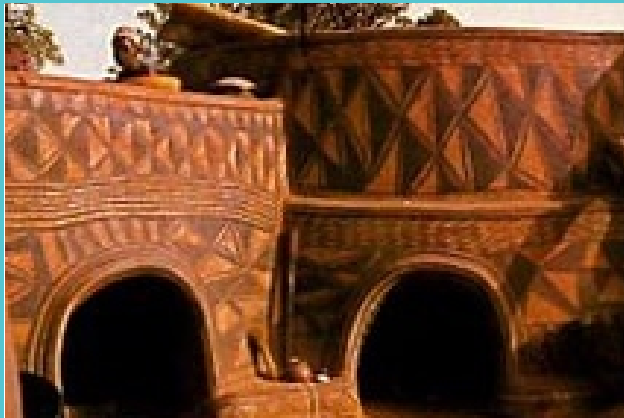




*Front view of the War Memorial Hospital in Navrongo*



*Frontage of a typical chief's palace*



*House Design*



*Laboratory*



*Prof Binka and Dr. Kofi Issa, former Director of Health Service - UER with stakeholders*

The NHRC partnered the Agronomy Department of the University of Ghana to implement the project while the University of Southampton provided an agronomist for the project.

Dr. Nonterah said with the help of the agronomists on the research team, they selected the staple food crops of the communities, and identified iron, zinc and carotenoids as key micro-nutrients that needed to be supplemented.

He said iron deficiency and anaemia are very high among females across the country, particularly in the Upper East region. Therefore, the research team chose crops rich in iron.

The researcher also explained the importance of zinc for all cellular body functions. "Zinc is essential in pregnancy for the formation of the baby. Many studies have shown that expectant mothers with low zinc levels end up giving birth to undersized babies, whose brains are not well developed. The team added carotenoids, another micro-nutrient found in green leafy vegetables and fruits."

"Carotenoids contribute to brain development of babies. It has been found that pregnant women who eat leafy vegetables give birth to babies with sharp brains. Breastfeeding mothers need more of carotenoids in order for their babies to grow well."

#### Planting methods

The research team together with the community members selected three staple crops namely, anaifu, cowpea and "tener."

Dr. Nonterah said the team selected legumes that were rich in iron, adding that the common bean was developed by the Crop Research Institute of Ghana, as a new variety.

"Eight communities were selected for the project and agricultural extension officers were sent to each community to help them with the right agronomic practices for the selected crops. In each community, the project selected 10-12 farm volunteers, men and women, to pilot the cultivation of the selected crops."

Dr. Nonterah said prior to the cultivation of the crops, soil samples were taken from each field for testing in order to determine the levels of some key elements including

nitrogen, phosphorus, and potassium). He said the selected crops were treated with iron, zinc and carotenoids, before planting.

#### Observations

After the agronomists had done their part, the medical team also went in to do "Cluster Randomised Trial" and the grouping of the eight communities into two, one under control and the other under the intervention.

Dr. Nonterah said the intervention communities were fed with crops treated with iron and zinc, while the control communities were fed with crops planted the normal way without any micro-nutrient supplementation.

"Some pregnant women in the intervention communities were selected to experiment the project to determine whether it could help enhance their micro-nutrient levels, particularly in the case of iron, zinc and carotenoids. Blood samples of the selected pregnant women were taken for laboratory analysis before they were fed with the crops treated with the micro-nutrients."

"After six weeks, blood samples of the same selected pregnant women were taken again to do further laboratory analysis. Before they were introduced to the treated crops, their iron levels were 11.5 and after eating the selected crops, their iron levels increased to 12.9"

"For zinc, their levels before they were introduced to the crops, was about 25.6. After six weeks they were introduced to the selected crops, with their zinc levels increasing to 39. The results from the project proved that there was a direct benefit of micro-nutrient supplementation on the health of people."

#### Nutrition

Nutrition plays a key role in the overall development of a person. Malnutrition could affect the economic gains of any country, hence the need to tackle it with all seriousness.

"Nutrition affects the brain more than anything. Malnutrition affects the development of brains. A well-nourished person has a bigger brain," he explained.

"Let's feed our children and pregnant mothers well so that we can have a more productive Ghana one day. It is only good nutrition that makes people become

intelligent."

He said malnutrition transcends generations, adding that a malnourished adolescent would give birth to children with low brain sizes.

"The intergenerational effects of malnutrition are dire, hence the need for the country to pay more attention to ensuring that it feeds its adolescent population, particularly the girls, well."

Dr. Nonterah is of the view that the future of the country depends on the health of its adolescent girls, explaining that when healthy adolescent girls give birth, they give birth to children with bigger brains who could think well to bring solutions to the many problems confronting the country, because "malnutrition kills brains."

#### Practices

Dr. Nonterah cautioned Ghanaians on how to treat vegetables and other food stuff to get all the micro-nutrients in them.

"People who dry vegetables for a long period of time as a way of preservation, end up losing some of micro-nutrients like iron and zinc. The best form to eat vegetables is to eat them fresh."

He expressed concern about the method of cooking which also contribute to the loss of some critical micronutrients, particularly in vegetables.

He deplored cultural practices that forbid pregnant women from eating foods with essential micro-nutrients, such as eggs.

#### Livelihood empowerment

As far as the livelihood empowerment aspect of the project is concerned, the selected farmers have acquired techniques for optimal nutrition from staple crops.

Dr Nonterah said the project would help the agricultural extension officers to scale up the interventions for selected farmers in the Navrongo enclave.

"The project created a pathway for sustainability in the communities, and volunteer farmers would transfer the knowledge gained to other farmers. Government must invest more in health research. As a nation we have not prioritised research because we do not have seed money for our research organisations."



# Data-driven Decisions

By Benedicta Gyimaah Folley

The Health and Demographic Surveillance System (HDSS) at the Navrongo Health Research Centre (NHRC) has served as a tool for data-driven decisions to be made on the planning, evaluation and development purposes.

This is in line with the United Nations recommendation of full integration of population factors into development strategies, ensuring demography plays an important role in the socio-economic development process.

Ghana is among countries committed to the monitoring and annual reporting on progress towards achieving the targets set by the Sustainable Development Goals (SDGs). The framework was to put data and evidence at the centre of global efforts to reduce poverty and promote economic and social development.

Demographic data therefore became a key tool in this regard.

The Navrongo Health and Demographic Surveillance Systems (NHDSS), monitors the Kassena-Nankana East and West districts and facilitates the evaluation of the morbidity and mortality impact of health and social interventions.

Statistician and Head of Demographic Surveillance Systems at the NHRC, Samuel Oladokun, has highlighted the importance of the platform in assessing the impact of community health and family planning services in a rural, traditional area of northern Ghana.

The project, which began three decades ago as an experiment at the Centre, clarified societal constraints to reproductive change and how African cultural characteristics could be a resource for family planning programmes.

The Navrongo project became the first African experimental trial of the demographic impact of family planning, whose findings are now a national policy in Ghana and being replicated in many other countries in Africa.



*Fieldworkers visit homes every six months*

Mr. Oladokun said currently there are 168,000 people in 32,743 households in the two districts under surveillance.

Events that are monitored routinely include pregnancies, births, morbidity, deaths, migration, marriages and vaccination coverage.

Data updates are done every six months by trained fieldworkers. Features of the NHDSS include the community key informant system where trained volunteers routinely report key events, such as births and deaths as they occur in their locality and the verbal autopsy (VA) system for determining the probable cause of death at the community level.

Data from the NHDSS is shared with funders and collaborators and partners in the International Network for the Demographic Evaluation of Populations and their Health (INDEPTH).

The NHDSS has since provided platforms for evaluating several interventions of national and international significance.

Mr. Oladokun said the operations of the NHDSS cover all persons and households in the Kassena-Nankana East and West districts.

That, he said, involved regular visits to the households to update health and socio-demographic information.

“Trained fieldworkers visit homes every six months to interview heads of households, using a compound registration book (CRB), which contains basic information of all individuals in a household. Where a new event is recorded, the CRB is filled to provide detailed information about that particular event,” he explained.

The system maintains one unique identification (ID) number for each registered individual and those who migrate from one part of the surveillance area to another.

The migrated ones are referenced with the initial ID number assigned to them in their original location.

Mr. Oladokun said in referencing what had been measured and how the HDSS databases had been constructed, different data are measured at different time periods under the NHDSS.

He said longitudinal health and demographic data has been collected over the past two decades in addition to information on non-communicable diseases and cases of maternal and child health.

**“...adding that other biological measures that had been documented in the area include carriage, outbreaks and surveillance of meningococcal meningitis.”**



He said data on malaria epidemiology, including malariometric features of the area, have been extensively characterised, adding that other biological measures that had been documented in the area include carriage, outbreaks and surveillance of meningococcal meningitis.

Mr. Oladokun said respiratory infections, including pneumonia, as well as diarrhoeal diseases and rotavirus infections are the diseases the children are dying from.

He pointed out that studies on neglected tropical diseases, micronutrient deficiencies, and safety, immunogenicity and pharmacokinetics of drugs and vaccines, were also investigated.

“Immunology, genomics and genetics biomarkers are studied,” he stated.

Key findings

Some key findings from the Centre's experiment showed that placing nurses within communities and assisting them with locally-based trained volunteers, helped to check fertility, increased utilisation of family planning services, and increased childhood immunisation coverage and better health outcomes, according to Mr. Oladokun.

He, however, decried the high malarial deaths among children under five.

Mr Oladokun said the refusal by the populace to give information to field workers, is a key challenge, and urged residents to provide the needed information to help in data gathering processes.

He pointed out that information provided during field work is treated with confidentiality, so there is no need for anyone to fear that information provided would be used for other purposes aside what it had been collected for.

The NHRC was established in 1992 and is one of three research centres of the Ghana Health Service under the Ministry of Health.



*Presbyterian Primary Health Care  
(Hospital) - Talensi-Nabdam, Upper East*

# It takes a Village

By Eunice Menka

"It takes a village to raise a child," says an old African proverb implying that the entire community plays a role in the upbringing of a child.

This has been the inspiration for the Navrongo Health Research Centre (NHRC) to study an intervention that encourages pregnant women and their support networks to seek modern maternal care.

The social science study, known simply as "It takes a village," began in June 2021, in the catchment area of five clinics forming part of the Presbyterian Primary Health Care (PPHC).

Presbyterian Primary Health Care (Hospital) - Talensi-Nabdam, Upper East  
These facilities are the Bolga PPHC in the

Bolgatanga municipality, Namolgo PPHC in the Talensi district, and the Garu PPHC in the Garu district. The rest are the Woriyanga and Sumaduri PPHC in the Tempani district.

According to the lead investigator of the study and Head of the Social Science and Public Health Department at the NHRC, Dr. Raymond Aborigo, the enrolment and baseline survey for the study was completed in December 2021 with a total of 280 women enrolled for the intervention and controlled arms of the study. The end line survey began in February 2022.

"Our study is designed to test whether education at durbars on the importance of timely and frequent prenatal care,

combined with phone messages to reinforce the education and household visits to develop birth preparedness plans with pregnant women, their partners and mothers-in-law, increase the use of maternal health services and improves maternal health outcomes," Dr. Aborigo explained.

The study uses the village setting and community involvement to encourage women to pursue maternal care and modern interventions. It is designed as a randomised intervention involving community education, phone calls and home visits to reinforce key messages.

Dr. Aborigo said, as part of the study, pregnant women are reminded about their dates of prenatal attendance and encouraged to attend.

They are educated on the importance of having birth preparedness plans, and the need to deliver in health facilities.

“The key messages given to the participants are centered on the importance of accessing modern maternal care, initiating antenatal care early in pregnancy, and how to identify danger signs and complications associated with their condition. There is a monitoring of the pregnancy to check on them and preparation of birth plans

He added that the study takes into account deeply entrenched cultural beliefs and focuses on barriers that many Ghanaian women, especially those living in impoverished rural areas, face in obtaining timely and frequent antenatal care.

According to Dr. Aborigo, the study aims at increasing women's awareness of having a birth plan that may help them plan ahead to give birth at a health facility instead of giving birth at home,

reducing preventable maternal deaths, and tracking progress against the Sustainable Development Goals (SDGs).

In October 2021, the WHO said the new global target is under an Ending Preventable Maternal Mortality (EPMM) initiative to improve access to a continuum of care needed before, during and after pregnancy and childbirth.

The initiative includes a broad coalition of partners working in maternal and



*Renovated staff quarters'*

together with husbands and mothers-in-law.”

The World Health Organization (WHO) recommends a minimum of eight antenatal care (ANC) contacts.

In Ghana, attendance of at least one ANC visit is nearly universal, however the recommended number of visits is not reached.

“Women bear the pregnancy, but in Ghana and many other patriarchal societies, decisions to seek health services are often made by other stakeholders. For instance, it is often the mother-in-law who makes decisions about the merits of ANC and the husband who makes the financial decision,” said Dr. Aborigo.

He said women typically start ANC late in pregnancy and many still do not deliver in health facilities.

where complications during childbirth often lead to negative outcomes.

Key partners involved in the study are the University of California at Berkeley and the University of Ghana. The study participants are pregnant women aged 18 years or older who are in their first or second trimester.

On the reactions of husbands and mothers-in-law to their involvement in preparing birth plans, Dr. Aborigo said “so far, we have enjoyed the cooperation of the significant others in the communities. We intend to further explore this as part of the evaluation of the project.”

“As yet, there are no preliminary findings, conclusions and recommendations. Until the study is completed, we would not know the outcomes of the intervention,” he explained.

The WHO, in partnership with the UNFPA, launched five critical targets to help countries get back on track in

newborn health on urgent actions with five clearly defined global and national targets for 2025.

The argument is that, new coverage targets and milestones are needed to be achieved by 2025, if the SDGs are to be met.

Under the EPMM initiative, it is expected that globally, 90% of pregnant women would attend four or more antenatal care visits, with this increasing to eight visits by 2030.

According to the WHO, most maternal deaths are concentrated in a relatively small number of countries, with two-thirds occurring in sub-Saharan Africa.

The global body is therefore urging all stakeholders to take action and increase commitment and investment, with interventions tailored to local context and challenges.



# IN PURSUIT OF A COMMON GOAL

By Eunice Menka

The Navrongo Health Research Centre (NHRC) and the Navrongo War Memorial hospital are situated at the same site, the NHRC located right behind the hospital.

The two institutions have made the most of their proximity and similar

project, known as the Ghana VAST, was a success and added to child health interventions.

By 1992, the Ministry of Health (MOH) had adopted the facility and upgraded it to a research centre status, with the mandate to investigate national and international health

independence of Ghana, and dedicated to the men from the area recruited into the army to fight in the first world war from 1914-1918.

The hospital has a catchment population of about 190,000. It serves as a referral facility for the Builsa North Municipal district, the Builsa South district and the Kassena-Nankana West district. The War Memorial hospital is also known as the Kassena-Nankana Municipal Hospital.

Despite the huge age gap between the hospital and the NHRC, the two institutions have been able to find a lot of common ground to work together in a mutually-beneficial way.

As a major stakeholder, the NHRC has often supported the hospital to improve health care delivery to the people of the Kassena-Nankana Municipality and adjoining communities.

Some major support includes the adoption of the paediatric ward of the hospital around 2003 and the

goals. They have worked closely over the years on the shared vision of ensuring quality health care and providing research-based evidence for optimum health outcomes for the people of the Upper East region.

The Centre appears hidden behind the hospital whose structure makes it impossible for passers-by, clients and visitors to see beyond.

However, the serenity provided by the cover is just ideal for the NHRC to carry out health research activities which impact policies and interventions within Ghana and beyond.

The NHRC started in 1988 as a field site to investigate the impact of repeated large doses of Vitamin A supplementation on child survival in Kassena-Nankana district. The

problems and to enhance the development of evidence-based policies, by generating relevant and empirical knowledge, and information on priority health areas.

The War Memorial hospital predates the NHRC. It was built before the



Front view of the hospital



Inside the Children's Ward



*The Emergency Ward*

provision of basic infant and paediatric medical care equipment to improve care.

As part of the Centre's social responsibility, it built and furnished the Emergency Ward in 2017 to support

The Centre donated medical items to support the Intensive Care Unit (ICU) of the Emergency Ward.

Periodically, the Centre provides medical supplies and critical logistics to support the operations of these



*Administrator of NHRC, Mrs. Andriana Sumbuh presenting the keys of the facility to Mr. Bentie Abubakari, Administrator of the hospital*

quality care delivery in the area.

Before then, the War Memorial Hospital did not have an emergency ward to take care of accidents and related cases.

wards. Medics from the Centre are attached to the wards for the necessary consultations for optimum care.

Support for the Children's Ward is crucial because it is the focus of



*Dr. Abraham Oduro, former Director of the NHRC, presenting items to Dr. Edwin Saanwie, Medical Superintendent of the hospital*

paediatric vaccinations and the first point of referral for children participating in the Centre's clinical trials. It is therefore partly the responsibility of the Centre to ensure that participants who take part in its research activities have optimum medical care at the ward.

The Centre has been concerned with issues related to pregnant women and renovated the Waiting Room for caregivers who accompany pregnant mothers to the hospital for delivery.

The facility was handed over to the hospital in 2020 by the Administrator of the Centre, Mrs. Andriana Sumbuh, on behalf of the Director of the Centre. This was done after conducting authorities of the War Memorial hospital round the facility, and the

keys to the facility were presented to Mr. Bentie Abubakari, Deputy Chief Health Service Administrator of the hospital, in a brief handing-over ceremony.

All the support from the Centre has helped to improve health care delivery in various sections of the hospital, while the NHRC also benefitted from the hospital's support, in terms of engagement of the hospital staff such as nurses, anaesthetists and clinicians, to work on research projects.

Participants of the Centre's clinical trials who fall ill, are referred to the hospital as the first port of call.

The hospital allows international students on internship at the Centre to access its facilities for practical training.

Evidently, the ingredients of proximity, unity and support are blending well for the Centre and the hospital to team up in pursuit of good health outcomes in the Upper East region and Ghana, enabling the Centre to contribute to national and international health interventions and policies.



# HATS OFF TO KASSENA-NANKANA

BY GODFRED A. POLKUU

The Navrongo Health Research Centre (NHRC) has commended communities in the catchment area for their participation in clinical trials over the years.

The chiefs and elders in the Kassena-Nankana Municipality of the Upper East Region, as well as various Regional and District Directors of the Ghana Health Service (GHS), are among stakeholders who have been eulogised for supporting the Centre during important trials.

The unflinching support enjoyed by the NHRC is attributable to the community's understanding of the positive outcomes of the studies.

The Paramount Chief of the Navrongo Traditional Area, Pe Denis Aneakwo Balinia Adda Asagpaare II, applauded the



The Paramount Chief of the Navrongo Traditional Area, Pe Denis Aneakwo Balinia Adda Asagpaare II

very fortunate to have it here," he said.

Touching on some ground-breaking clinical trials at the NHRC, Dr. Nana Akosua Ansah, Head of the Clinical Science Department, recollected how the Centre started with the Vitamin 'A' supplementation trial, which resulted in the introduction of Vitamin 'A' into the Expanded Programme on Immunization (EPI) for infants.

"The next impactful trial was on insecticide treated nets (ITN) which led to the widespread use of bed nets in malaria-endemic areas."

"We cannot do clinical trials here without a cooperative population supporting the trials that we have undertaken."

This support contrasts with the apprehen-



Head of clinical trials, Dr. Nana Akosua Ansah

education is done in the language of the people. All those who matter, including opinion leaders and chiefs in the communities, are briefed on any study to be undertaken," Dr. Ansah explained.

"Our staff always ensure that the protocols are followed in carrying out vaccine trials. The NHRC and the local communities have become one big family, and majority of the staff of the Centre live among the people."

Dr. Ansah said the Centre has helped improve the health outcomes of the communities with an added benefit of improving the economic livelihoods of the people, since a lot of the staff and field workers are employed by the Centre.

She said the NHRC sought to invent a malaria vaccine, and conducted epidemiological studies into the prevalence of malaria. However, the particular



Dr. Patrick Odum Ansah, Director of the NHRC

NHRC and acknowledged that its work has impacted the people. He expressed his appreciation during a courtesy call on him by journalists from the African Media and Malaria Research Network (AMMREN). He explained that due to the work of the Centre, the people in the area have basic knowledge on health conditions such as malaria and how to respond to them.

"The Centre has come to help not only the people of Navrongo, but the whole country. We, the people of Navrongo, are

sion among some communities regarding vaccine trials.

Dr Ansah, recalled the resolve of the Kassena-Nankana community to take part in the Ebola vaccine trials, at a time when the people in Hohoe in Volta Region, were incredulous and kicked against the trials.

"Anytime the NHRC carries out a study, scientists from the Centre visit the communities to sensitise them before people are enrolled for the study. The

candidate vaccine did not work as intended, and was not introduced.

"But then, afterwards, we had the rotavirus trial in Ghana, Kenya and Malawi. In Ghana, it was done here in Navrongo. That trial resulted in the introduction of the rotavirus vaccine into our EPI system. Rotavirus is a virus that causes diarrhoea and other intestinal symptoms. It's very contagious and is the most common cause of diarrhoea in infants and young children worldwide."

“Almost right after that, we had the meningitis vaccine trial in the paediatric arm, and it was done only in Navrongo here. That resulted in the MenAfriVac vaccine being introduced into the EPI for infants worldwide,” Dr. Ansah added.

The head of clinical science said there were trials linked to the RTS,S Malaria vaccine to assess its efficacy and safety when used in greater numbers of children. She added that due to the recent COVID-19 pandemic, two COVID-19 vaccines were taken through trials, with several others yet to undergo trial.

Director of the NHRC, Dr. Patrick Odum Ansah, gave a brief history of the Centre and explained how it was established in 1988 as a Field Station.

He said after the trial of vitamin 'A' supplement in children, which lasted for about five years, there was a stakeholder engagement to deliberate on what the Field Station should be used for.

The Director said Professor Fred Newton Binka, an investigator in the trial, and his associates, decided that the facility should be left as a Field Centre for the Ministry of Health (MoH) to help evaluate health problems in the Savanna belt of Ghana.

“In 1992, the Centre was named Navrongo Health Research Centre.”

Dr Ansah explained that the first study was supposed to be done in Bawku, but when the investigators arrived, they realised that there was some vitamin 'A' supplementation in Bawku.

Navrongo was selected because the Regional Director of the Ghana Health Service (GHS) at the time, observed that the areas had not benefited from any vitamin 'A' supplementation, and was deemed to deserve the intervention.

The Director said the Centre now has a staff strength of 350, comprising 50 scientific personnel and 300 field support



*The Administration Block of the NHRC, named after Professor Fred Binka*

staff, most of whom are project staff not paid by the government.

“The Centre usually receives core staff such as doctors, nurses, pharmacists, laboratory scientists, research grade officers, including support staff such as administrators, accountants, cleaners and drivers, to deliver on its mandate.”

“ Most of the research work done in the NHRC were with grants and funding from external partners. Each grant has its

own, we have to make do with the little we get from partners, and from government.” He pointed out that poor infrastructure and erratic power supply are some of the challenges the Centre faced, adding that the erratic power supply affected refrigerators, chemistry and haematology analysers, among others.

Some equipment in the laboratory Dr Ansah recalled that three years ago, the Centre lost equipment valued about GH¢200,000.00, adding that even



*Some equipment in the laboratory*

specification of people we need. If the core staff are not able to satisfy all that, the project makes way for us to recruit, train and replace people who can fill these peculiar positions.”

He said the NHRC, like other institutions in Ghana, has faced several challenges.

“We don't have enough funding of our

though the equipment were insured and were catered for, they still lost equipment valued about GH¢ 50,000.00, as the insurance policy did not cover all the damaged equipment.

He appealed to government and partners to intervene in the power situation to save their equipment.



# NHRC Tackles Silent Killers

BY MAVIS OFFEI ACHEAMPONG

It is tragic enough that more people die from cardiovascular diseases (CVDs) than any other cause. Even worse, more than three-quarters of heart disease and stroke-related deaths occur in low-and-middle-income countries, including Ghana.

Cardiovascular disease and depression share common risk factors such as genetics, aging, personality traits, chronic stress, poor nutrition, alcohol abuse, tobacco use and lack of physical exercise.

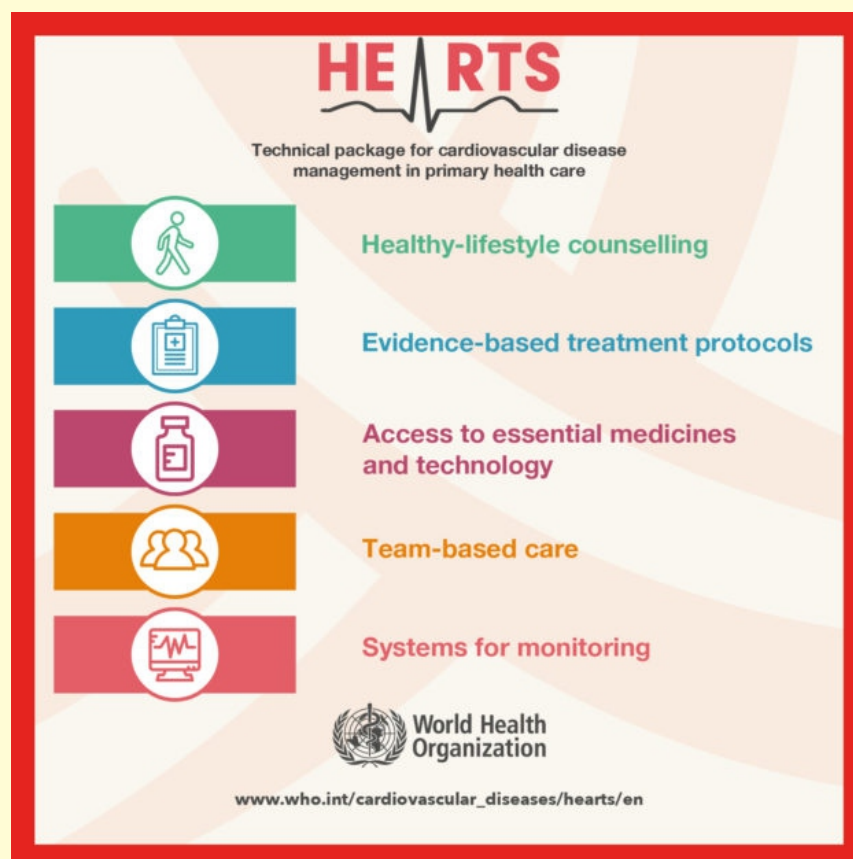
The strongest factor is the economic problem, which affects most persons in rural and urban communities in Ghana.

As a strategic approach to improve cardiovascular health, the World Health Organisation (WHO) designed the HEARTS technical package to strengthen its management in primary health care settings.

It has practical, step-by-step modules and an implementation guide that supports ministries of health to strengthen CVD management, using an integrated approach to the management of non-communicable diseases (NCDs).

In line with the WHO strategic approach, the social sciences and public health department of the Navrongo Health Research Centre (HNRC), intends to pilot and implement the HEARTS technical package with the introduction of NCD management within the Community-based Health Planning and Services (CHPS) programme in some health facilities in the Kassena-Nankana Districts of the Upper East Region.

The intervention being tried at frontline CHPS compounds, will link the care and management of these diseases to the CHPS compounds as a way of improving access to



these services.

According to the Head of the Social Sciences and Public Health Department of the NHRC, Dr. Raymond Aborigo, this would allow for the early detection and sustained management of these diseases at all levels of the health system.

"Through a series of research interviews with CHPS nurses, volunteers and community members, we found that the management of NCDs is a serious concern for the health workers."

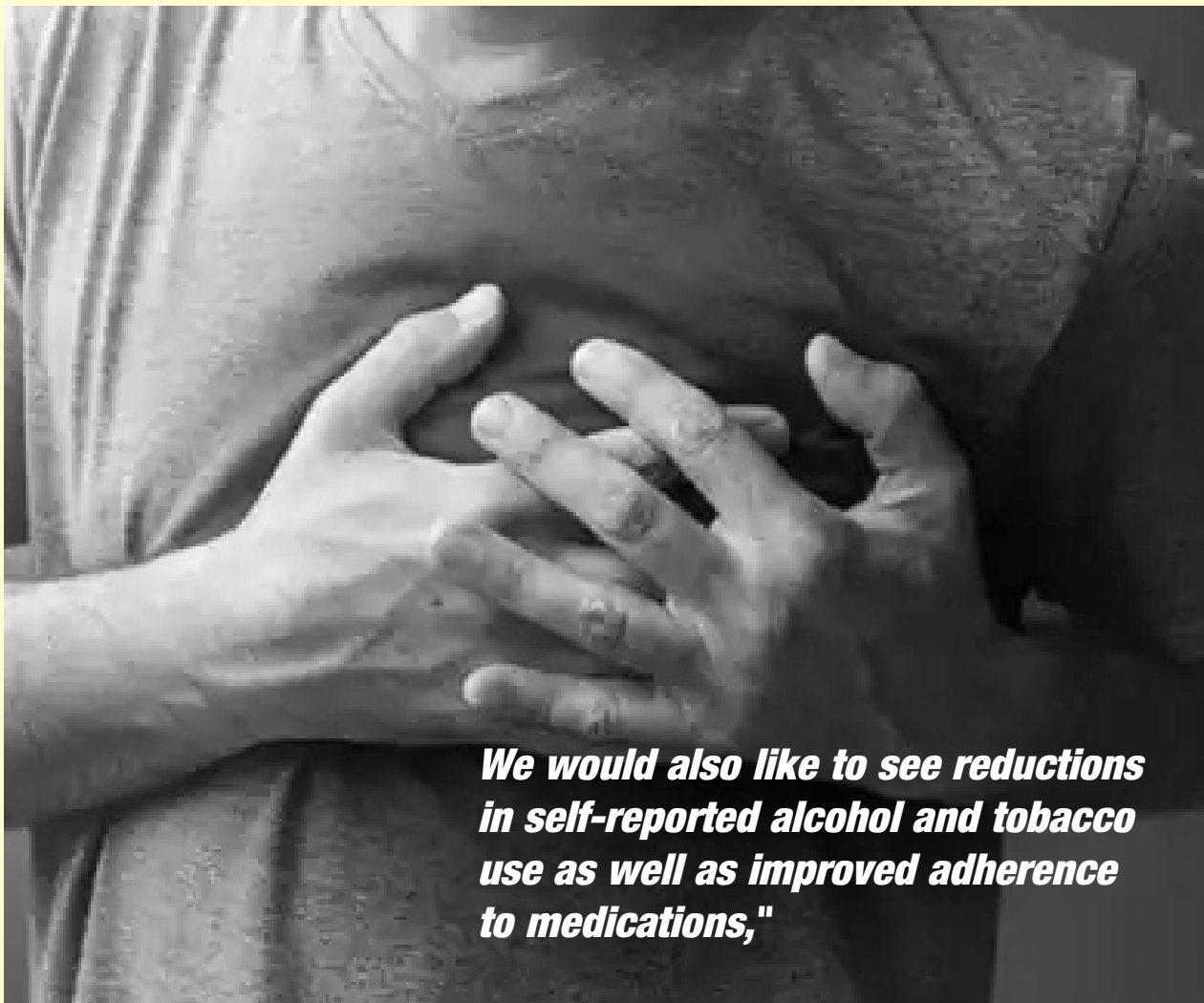
"We also learned that CHPS nurses and patients want depression and hypertension care to be integrated into one care programme, with the essential element of behavioural counseling handled by

community volunteers who are available, trusted by the community members and communicate effectively in the language of the people. The nurses also showed willingness to screen, manage and monitor the less severe forms of the conditions."

While the management of these 'silent killers' is key to the survival of patients, symptoms may not be clearly identified, even as they continue to claim lives.

The 8-week pilot intervention will screen persons aged 35 to 70, due to their high NCD risk with check-ins at 3-, 6-, 9- and 12-months post-intervention.

Programme evaluation, including outcome measurements and qualitative interviews,



***We would also like to see reductions in self-reported alcohol and tobacco use as well as improved adherence to medications,"***

will take six months, while data analysis is expected to take additional six months.

At the end of the pilot, it is expected that persons with uncontrolled hypertension and depression will show an improved systolic blood pressure, depression score and medication adherence.

"We would also like to see reductions in self-reported alcohol and tobacco use as well as improved adherence to medications," said Dr. Aborigo.

The CHPS-NCD programme will recruit adults with either uncontrolled hypertension or uncontrolled depression, who live in the four selected CHPS zones such as, the Mirigu and Navio compounds in the Kassena-Nankana West District, as well as the Wuru and Yua compounds in the Kassena-Nankana Municipal.

Ultimately, pilot phase of the programme will be scaled up to include additional

chronic conditions and patients.

"The implementation of the pilot intervention could potentially lay the foundation for a sustainable non-physician-led screening and control programme to address numerous NCDs in Ghana" Dr. Aborigo explained.

The CHPS programme, Ghana's flagship intervention for primary health care, was implemented by the population group within the social science department of the NHRC.

The department has conducted population, reproductive health, health systems and community health research, with some shaping health policies in Ghana. Alongside the CHPS -NCD pilot project, the department is currently looking at trends in maternal mortality and the implementation of maternal audit recommendations.

"We are also looking at person-centered maternity care, testing interventions to ensure early and frequent antenatal attendance, as well as birth preparedness within the household. We are also conducting studies in community engagement strategies for genomic research, studies in the mental health of young people and positive youth development, where we amplify the developmental assets of young people.

Research and pilot programmes by the Social Sciences Department have attracted a lot of funding to the NHRC and broadened its network of collaborators in reputable universities across the globe.

The department has also contributed immensely to the visibility of the NHRC through research publications and its presence at national dissemination fora.



# Malaria Reservoir Studies

By Jamila Akweley Okertchiri



**T**he Malaria Reservoir Study (MRS) started in 2012, at the Navrongo Health Research Centre (NHRC) with a pilot and subsequent seasonal survey in the Bongo District of the Upper East Region.

It assesses the impact of natural experiments and malaria interventions implemented in the study area, taking advantage of its longitudinal and time series study design and dataset.

According to a senior research officer at the NHRC, Oscar Bangre, the study is aimed at characterising the reservoir of infection by comparing prevalence through microscopy and PCR-based methods.

“The study calculates the multiplicity of infection (MOI) by merozoite surface protein (MSP<sub>2</sub>) using molecular diagnostic methods and genotyping, to determine the plasmodium species present in the population.

It also assesses changes in frequency of drug resistance alleles, among other parameters. Mr. Bangre explained that the study was initiated prior to the implementation of very important malaria control interventions, and continued during and after the rollout of these interventions.

It is thus well positioned to evaluate the

impact of the malaria control interventions and programmes as well as the responses of this reservoir of malaria infection to the malaria control programmes.

It is also to provide significant inputs to future national malaria control programmes in Ghana and beyond.

## Malaria Reservoir



*Mr. Oscar Bangre*

Malaria reservoir connotes a perpetual pool of malaria parasites harbored in asymptomatic individuals of all ages in the study population, which fuels malaria re-infection throughout the year. This pool of malaria parasites is obscure or hidden and often not targeted by most malaria control interventions or therapy. Mr. Bangre said the first approach in the

study is the use of a time-series methodology or a longitudinal surveillance to be able to demonstrate the changes in reservoir of malaria parasite.

“The technical approach, however, entails microscopic examination of malaria parasites over time and season as well as molecular diagnostic techniques. In other words, the seasonal surveys since the year 2012 employed microscopic techniques (collection of blood smears on labeled frosted glass slide for malaria parasite morphological examination and count) and molecular diagnostic techniques (which are more sensitive and specific) to determine the dynamics in malaria parasite population and diversity,” he explained.

He said MRS studies have reported association of A-B-O blood group to resistance, susceptibility, and severity of *P. falciparum* malaria infection. He said the life cycle of the malaria parasite in the human host has two phases, namely, pre-erythrocytic stage and erythrocytic stage.

“During the erythrocytic stage, the parasites are released into the blood stream where they invade the red blood cells (RBC) as part of their developmental pathway. However, the parasites are unable to inhabit sickle-cell shaped RBC. This thus confers some level of protection to sickle-cell individuals.”

“Another condition associated with severity of malaria infection is G6PD deficiency. Individuals with this deficiency are unable to tolerate Sulphur-based malaria drugs which form part of the therapeutic regime for malaria. Hence, the study does blood typing to help us understand the dynamics in malaria transmission and infections in the study area.”

The senior research scientist noted that the speciation of the plasmodium in the population is done both by microscopy and molecular diagnostic techniques. “Seasoned microscopists are able to determine the species of plasmodium in microscopy blood slides using mainly the morphology of the parasites under the microscope.

for prophylaxis, inadequate or incomplete therapeutic treatments of active infections, a high level of parasite adaptability at the genetic and metabolic levels, and a massive proliferation rate that permits selected populations to emerge relatively rapidly.

He added that with the development of sophisticated methods of molecular analysis and the ability to manipulate genes of Plasmodium in transfection systems, considerable progress has been made in understanding how the parasite has been able to subvert the chemical attacks against it, which in turn is suggesting new strategies for continuing the fight.

**Impact**

The studies have greatly impacted

rounds in the Bongo district.

Indoor residual spraying Credit :AGAMal The three rounds of AGAMal (IRS) were implemented in the study area from 2013 and 2015. The successful implementation of various intervention programmes, including the IRS by AngloGold Ashanti have helped to prevent malaria and save more than one million Ghanaian lives.

Through the malaria control interventions, more than 1,177,450 people in 159,355 households across all operational areas are protected from malaria annually,” according to information from the mining firm.

Currently, the IRS intervention is being implemented in sixteen districts, including the Obuasi Municipality and Obuasi-East District, as well as all the



Indoor residual spraying Credit :AGAMal

However, a more exact and sophisticated method for malaria parasite species determination is by molecular diagnostics, using PCR.

This relies on the genetics of the parasite and gives more details regarding the structure and sub-divisions in the species,” Mr. Bangrestated.

The study also explores drug resistance by first and foremost, assessing and identifying drug-resistance alleles and markers in the chromosomes of the malaria parasites being studied.

He says through the studies, it has been established that resistance of malaria parasites arises from several factors, including overuse of anti-malarial drugs

malaria programmes and interventions in the country. Notable is its demonstration of what works best as a strategy for malaria control for the National Malaria Elimination Programme to adopt and expand as a priority among the multifaceted strategies they have.

For instance, the studies fitted very well for a “Before-During-After” assessment of the AngloGold Ashanti (AGA) Malaria Control Limited (AGAMal) indoor residual spraying (IRS) intervention in the Northern part of the country.

The results from the MRS demonstrated a significant reduction in the malaria parasite reservoir in the study and the rebound effect due to the suspension of indoor residual spraying, after the three

eleven districts in the Upper West and three districts in the Upper East regions. Since 2000, the world has made historic progress against malaria. According to the World Health Organization's (WHO) World Malaria Report 2020, 7.6 million malaria-related deaths have been averted since 2000.

In Ghana, the World Health Organisation data suggests that the proportion of deaths attributed to malaria per 100,000 population has decreased from 10.8/100,000 in 2012 to 1.1/100,000 in 2019. This progress has come about as a result of investments in education, prevention, diagnosis and treatment, research and development and building stronger health systems.



# FATHER OF CHPS

BY CARLTON COFIE

**A**s an epidemiologist, Professor Fred Binka opted for field work and impacting many lives, instead of being in the clinic and seeing a few patients.

In spite of the lack of basic amenities in Navrongo, Prof Binka was drawn to the area to work on a project recruiting 25,000 children for the vitamin A supplementation trial in Ghana.

His decision to impact many lives, materialised not only through the vitamin A supplementation trial, but also the shielding of vulnerable people with bed nets to protect them from mosquito bites and contracting malaria.

Making a good job of the tough circumstances in Navrongo, Prof Binka also developed the community health and planning services (CHPS) concept, which is saving lives in Africa.

## Prof Fred Newton Binka

According to the great scientist, there were three health centres in Navrongo, which were not being attended by the people, because everybody was far from everybody else.

“That led to the development of the CHPS concept, to put the nurses right into the community. It was borne out of the quest for primary health care services in a district with dispersed settlements.”

“I am the originator of the CHPS compound concept in Navrongo, where I trained other scientists, conducted studies, developed the community health scheme, as well as the community health school. The older commu-



*Prof Fred Newton Binka*

nity health practitioners remember my association with the project,” Prof Binka disclosed in an interview with **Eyes on Malaria**.

“The concept was developed to save the Ghanaian situation. Many countries including Ethiopia came to learn from Ghana.

In fact, the current Director-General of the WHO, Dr. Tedros Adhanom Ghebreyesus, was a minister for health in Ethiopia, who came to Ghana to learn about the CHPS concept to save lives at the community level,” said the eminent epidemiologist.

Prof Binka's emotional attachment to Navrongo is evident in his vivid recollection of the professional trajectory which took him there.

“I was seconded by the Ministry of

Health to Noguchi. From Noguchi I got a scholarship to the Hebrew University in Jerusalem, where I earned a Master's degree in Public Health (MPH).

Some of those who lectured me were from the London School of Hygiene and Tropical Medicine (LSHTM).”

“Strangely at the time, there was a research project to look at the Vitamin A supplementation and its impact on young children. That research was meant to take place in the Gambia where most of the studies of the LSHTM were undertaken in the past. As fate would have it, the late Dr Sam Ageyi, who was a student of LSHTM convinced them to bring the study to Ghana,” Professor Binka recalled with affection. The man who became the father of community health and planning services, was still working with the Noguchi Memorial Institute for

Medical Research (NMIMR), under Professor Colonel (rtd) Edwin Afari, head of epidemiology.

When the research team arrived in Ghana, they decided to establish the site at Navrongo, where they felt there was abundant indication of Vitamin A deficiency.

Prof Asare advised Binka that going to Navrongo was a big opportunity to put into practice what he learnt at the Hebrew University in Jerusalem.

The health ministry then agreed to make me relocate to Navrongo,” Prof Binka narrated.

“I got to Navrongo in the latter part of 1988 to implement the randomised trial of Vitamin A supplementation.”

“There was no electricity. Potable water was scarce. We depended on water tankers. Accommodation was tough and the weather was terrible, and my children hated the place, because of the heat.”

of the Kassena-Nankana district, with a population of 140, 000 people. We divided the district into 96 clusters, because the concept of a village was not very clear. There were mainly dispersed settlements, with about 13,000 compounds,” Prof Binka said.

“I learnt a lot from by British counterparts in the Vitamin A trial, enabling me to write and seek funding for the bed net trial. There were 13 investigators from Africa, and the number was trimmed to four.”



*Nayorigo - CHPS Compound*

The researchers were informed by Professor Richard Hayes, that if they need help in that town, they should look for Fred Binka, who had just returned from Jerusalem with a MPH.

“Initially, I was not really sure about going back to the north, having grown up in the north and had primary and middle school education there, as my father was working in the area.”

“Interestingly, Dr. Moses Adibo, Director of Medical Services at the time, rejected the idea of my being seconded to that study, and the ministry seconded another public health specialist to work with the researchers.”

“Three months into the project, the researchers insisted that if I was not seconded to work with them, they would move the project to the Gambia.

The area was desolate, but the attraction of changing the lives of the people, was irresistible.

“Navrongo was not an auspicious place with cinemas and theatres for entertainment. However, I soon recognised the value of the work we were doing there.”

“Dr. Adibo called me in 1991, and asked me what I wanted to do next, as the Vitamin A supplementation study was about to end.”

I told Dr. Adibo that since I was not the lead investigator of the Vitamin A supplementation project, I would love to embark on a large-scale trial on which I would be the principal investigator.

“In the bed net trial, we used the whole

“In those days there was no Kintampo Health Research Centre (KHRC) and the Dodowa Health Research Centre (DHRC). In fact, the people we trained in Navrongo, came to establish the KHRC and the DHRC.”

“The ministry at the time was not into full time research, except that they had a quality unit at the Health Research Unit in Accra. We had a policy to create three centres across the country – northern Savanna, Kintampo for the middle belt, and Dodowa in the south of the country. That is how we got the three centres,” he explained.

“We came from Navrongo and convinced the ministry to allow us to represent the northern Savanna. We needed money to run the centres. The sponsored Vitamin A trial was about to end, and money had to be raised for the



remuneration of a couple of people in order to make things materialise.”

### Positive impact

Prof. Binka recounted the positive impact of Navrongo on his life, which has made him what he is today, and became the source of his affection for the area.

“Having trained as a physician, I was elated to be at a research centre doing cutting-edge scientific research. I learnt the rudiments of writing proposals for the bed net trial,

Another problem was enticing women to take up appointment in Navrongo, because of the isolation. The journey from Tamale to Navrongo took more than four hours.”

Touching on the growth and transformation of the Centre, Prof Binka said, with very little support from government, the centre is still running well after 30 years.

He said the management created a research environment, for which Ghana has been recognised as a global

“The last scientific review indicated that our people were among the top 15 scientists in Ghana. We trained many of the indigenes to take up the positions in their own area, partly because it was difficult to get professionals to relocate there.”

“We got into the business of taking people from high school and training them, helping them to go to university and coming back to work. They are mainly our social scientists, clinicians and statisticians, who started as field workers, but have progressed to top-level scientific professionals.”

Prof Binka would have wished that it was easier to convince government to allocate more resources for research, for better development.

“It has been a difficult task to convince government to part with money for research. However, through our own efforts, we have been key players in malaria control. The World Health Organisation (WHO) would not eliminate malaria, without acknowledging the role of the NHRC. Our international partners confirm that wherever there was vital research, Navrongo is held in high esteem.”

There was recognition for the research work in Navrongo by the National Malaria Elimination Programme (NMEP) in 2022, when it acknowledged them as pioneers in the fight to eliminate malaria in Ghana.

In appreciation of Prof Binka's devoted leadership, the NHRC Administration Block has been named after him.

“The building was named after me 20 years after I left Navrongo. I was humbled by the acknowledgement of my contribution to building a solid foundation. I was really excited.”

The University of Health and Allied Sciences, where the great man was foundation Vice-Chancellor, has also honoured him by renaming the School of Public Health, Prof Fred N. Binka School of Public Health.



Lab Technician at work

competing, with 15 other groups in the world for funding, which was not easy. It made me mature quickly.”

“I learned how to form the vital network in the business of health research, which was completely different from sitting in a clinic. Day in, day out, I was in the middle of research work.”

“It was difficult to build my team at the time, as it was almost impossible to convince professionals to move to Navrongo, due to the lack of amenities in the area. We could not even appoint an accountant, not to mention a financial director.

centre where people can develop their research career.

“In spite of all the hard, it took the government about 15 years to absorb the minimum core staff, running the place. In my time only three of us were on government payroll, out of 250 personnel.”

“The team that assembled in what I call the Navrongo University, has impacted the whole of Ghana, including the University of Ghana (UG), University for Development Studies (UDS), University of Health and Allied Sciences (UHAS), etc.”

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## ABOUT AMMREN

The African Media and Malaria Research Network (AMMREN) is a registered non-governmental organisation made up of African journalists and scientists working together towards the control and elimination of malaria. Established in 2006, AMMREN is based in Accra, Ghana. The vision of AMMREN is a society of well-informed people working together to end malaria and other diseases in Africa.

AMMREN has over the past 17 years been actively involved in media advocacy for the elimination of malaria and other diseases on the African continent. AMMREN started with chapters in 10 African countries, namely, Burkina Faso, Gabon, Ghana, Kenya, Malawi, Mozambique, Nigeria, Senegal, Tanzania and The Gambia, with over 300 members currently on its database across Africa. The network is now open to all active journalists in mainstream media, freelancers and online journalists.

AMMREN is the only media Network that worked closely with scientists and researchers who carried out the RTS.S malaria vaccine trial in 11 sites in seven (7) African countries. Several documentaries and magazines were produced on the malaria vaccine.

AMMREN has published over 18 editions of its flagship magazine, Eyes on Malaria and circulated more than 10,000 copies globally

## MAGAZINE PRODUCTION

