Capacity building in Burkina Faso

Dr Sodiomon Bienvenu Sirima reveals how his institution has thrived by focusing on the development of research personnel and infrastructure, leading to new horizons of home-grown malaria research.

What is your research background and how did it lead you to becoming involved with the Centre National de Recherche et de Formation sur le Paludisme (National Centre for Research and Training on Malaria – CNRFP)?

I received a Master's in Medical Sociology and a medical doctorate degree from the University of Ouagadougou, Burkina Faso; and then a PhD in Epidemiology from the Sapienza University of Rome, Italy. Following this, I served as a medical doctor for a district hospital in Burkina Faso for two years. My interest in malaria research led me to join CNRFP – the preeminent malaria research institution of Burkina Faso’s Ministry of Health. I was head of the Centre’s Research and Training Department from 1995-2009, and have held the position of Executive Director since January 2010.

Do you collaborate with other West African countries to share resources and knowledge, and therefore to help fight malaria on a larger scale?

We are involved in several multicentric studies and collaborate through consortia which represent an array of countries from across the region, including Senegal, The Gambia, Mali, Guinea, Guinea-Bissau, Nigeria and Ghana. We work together to strengthen capacity and share experience and resources.

What other organisations do you work with to control malaria in Burkina Faso?

In Burkina Faso, we work with the National Malaria Program as well as national universities in Ouagadougou and Bobo-Dioulasso. In addition, we work with international institutions and organisations such as the European and Developing Countries Clinical Trials Partnership (EDCTP), European Vaccine Initiative, London School of Hygiene and Tropical Medicine and many others. Contact is also maintained with our original Italian Development Cooperation partners, who helped to initiate CNRFP in the 1980s.

How involved are you in working with local populations to ensure their...
combination therapy led to its implementation of fixed-dose artesunate-amodiaquine in countries. In addition, our investigation to adopt a strategy for malaria endemic guided the World Health Organization (WHO) conducted studies into the use of insecticide-innovative tools and approaches to reduce malaria burden of the disease and do not experience the same benefits from malaria control tools.

**CNRFP has thrived since its initiation in the early 1980s, despite political and social turmoil, and withdrawal of its Italian support programme.** What major challenges have you faced as an institution and how have you overcome them?

When the Centre began as an Italian programme, the core expertise was, of course, Italian. The major challenges when this support was removed were reinforcing our infrastructure (labs, offices, equipment, personnel, etc.), building a local team and ensuring it was competitive at the international level. From there we endeavoured to achieve effective scientific outcomes and maintain staff and competitiveness at the high level.

I can honestly say that after working hard for almost a decade, we finally have a strong research team thanks to international funding. It is because of this continual support that CNRFP has not been hugely impacted by political and social issues.

**What aspect of the Centre's work from the last 30 years are you most proud of?**

The institution’s strengths come largely from its personnel, who are highly trained and work to international standards. CNRFP is now open to both international public and private partners.

At the scientific level, our aim is to develop innovative tools and approaches to reduce the malaria burden. For example, we have conducted studies into the use of insecticide-treated bed nets since the 1990s, which guided the World Health Organization (WHO) to adopt a strategy for malaria endemic countries. In addition, our investigation of fixed-dose artesunate-amodiaquine combination therapy led to its implementation in many African national programmes.

**MALARIA IS A** truly global health concern, but it is most prevalent in sub-Saharan Africa and this is where its effects are felt most. According to the World Health Organization (WHO), in 2010 90 per cent of all malaria deaths occurred in the African region. While there is much that international organisations such as WHO can do to amend this situation, it is also important that efforts to combat malaria come from local African initiatives, as they can provide unique perspectives on this devastating parasitic infection.

At the Centre National de Recherche et de Formation sur le Paludisme (National Centre for Research and Training on Malaria – CNRFP) in Burkina Faso, a team of health specialists are overseeing the development and integration of the country’s malaria control programme. The Centre conducts operational and basic research to develop new tools for malaria control in the region. Training healthcare providers and scientists in malaria control, creating state-of-the-art research facilities, building capacity and providing career opportunities are all key aspects of CNRFP’s work.

**THE CENTRE’S HISTORY**

The Centre’s roots can be traced back to the early 1980s, when it was established as a community-based project, with support from the Italian Development Cooperation initiative, to control malaria in Burkina Faso’s capital city, Ouagadougou. The project expanded rapidly and by 1986 it had become a well-established institution called the National Centre for the Fight against Malaria (CNLP). In 1998 CNLP became CNRFP, recognising that its objectives had moved towards research and training – a mandate that was guided by Burkina Faso’s Ministry of Health. Thanks to funding from the WHO-TDR Multilateral Initiative on Malaria, the African Malaria Network Trust; The European Vaccine initiative, the National Institutes of Health, The EU Framework Programmes, the Malaria Clinical Trials Alliance and the European and Developing Countries Clinical Trials Partnership, CNRFP quickly became the leading malaria research establishment in the country.

**TAKING ACTION**

The team is engaged in multidisciplinary, collaborative research and maintains a strong relationship with the National Malaria Program, policy makers and various universities throughout Burkina Faso; as well as other national research centres, sub-regional research centres and its original Italian partners. CNRFP actively contributes to malaria control policy on a national and international scale, and its studies have set the scene for policy changes in such critical areas as insecticide-treated mosquito net use, home management of malaria, treatment in pregnant women and the recommendation from WHO on seasonal malaria chemoprevention – the intermittent administration of full courses of antimalarial medicine during high-risk seasons.

The Centre has come a long way since its humble beginnings, establishing itself as a clear focal point for regional research. “We are incredibly proud of our accomplishments over the last decade in terms of raising the standards of research within CNRFP, and particularly our legacy to the next generation,” enthuses the Centre’s Executive Director.
Dr. Sodiomon Bienvenu Sirima, MD, PhD
Executive Director, CNRFP

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The Centre has been trialling a variety of antimalarial drugs, with some promising results to date

- Artesunate-mefloquine combination for the treatment of uncomplicated malaria in African children versus artemether-lumefantrine
- Efficacy and safety of dihydroartemisinin-piperaquine versus artesunate-mefloquine in children aged 12-60 months
- Efficacy of artesunate plus chloroquine for treatment of uncomplicated malaria in Burkinabé children: a double-blind randomised, controlled trial
- Efficacy of artemisinin-based combination therapy drugs
- Seasonal malaria chemoprophylaxis

The team at CNRFP has also been conducting investigations into a long-awaited malaria vaccine:

- The efficacy, safety and immunogenicity of heterologous prime-boost immunisation with a prime-malaria vaccine (ChAd63 ME-TRAP) and MVA ME-TRAP in five-to-17 month-old infants and children
- Evaluation of immunogenicity, safety and reactogenicity of an adenovirus-type 35-based circumsporozoite malaria vaccine in Burkina Faso children aged 12-45 years old
- Multicentric examination to evaluate the efficacy, safety and immunogenicity of gmz2 candidate malaria vaccine in Gabonese, Burkinabe, Ghanaian and Ugandan children aged 12-60 months
- A merozoite surface protein-3 long synthetic peptide (MSP 3) candidate vaccine (preliminary results were promising and findings were published in the New England Journal in 2011)

Dr Sodiomon Bienvenu Sirima, who has been a staff member for over 20 years.

CENTRE STRUCTURE

CNRFP’s headquarters and its network of satellite field sites have been established in Ouagadougou, and the institution is divided into four technical departments. The biomedical sciences department conducts laboratory studies into malaria parasites and their hosts, while the public health department investigates broad research into malaria prevention in populations, as well as individual case management. There is also a socioanthropology department which examines community behaviours and how these relate to malaria control within those communities. Finally, a data management team deals with data generated by the other departments. Each group is run by staff with a wide range of expertise and backgrounds, including epidemiology, parasitology, immunology and medical entomology.

Two trial sites have been developed by the Centre: the first is located in Balonghin within the Saponé Health district where malaria is considered moderate and seasonal (this region covers 93,000 inhabitants in 79 communities). The second site is the Clinical Research Unit of Banfora which is located in the regional hospital where malaria transmission is much higher, and particularly intense during the rainy season (this region covers 600,000 inhabitants).

LOOKING FORWARDS

Ensuring transparency and accuracy in their research, and the translation of results into best policy practice, will be a crucial aim for the Centre over the coming years. They hope to establish a third research station in the Sahel region of northern Burkina Faso where malaria transmission is low, in order to gain comparative information and create novel prevention and eradication strategies. Training the next-generation of scientists will be another key area of CNRFP’s work; the group is keen to provide access routes for young researchers to develop their careers, as well as training opportunities for scientists in Africa and internationally. The team also aims to develop extensive partnerships with institutions and academia to further their reach and assist in the teaching of a wide range of malaria-related subjects, namely immunology, vector biology and molecular biology. Furthermore, CNRFP is looking to broaden its scope by examining other tropical subjects, namely immunology, vector biology and molecular biology. Two trial sites have been developed by the Centre: the first is located in Balonghin within the Saponé Health district where malaria is considered moderate and seasonal (this region covers 93,000 inhabitants in 79 communities). The second site is the Clinical Research Unit of Banfora which is located in the regional hospital where malaria transmission is much higher, and particularly intense during the rainy season (this region covers 600,000 inhabitants).

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RECENT TRIALS

The Centre has been trialling a variety of antimalarial drugs, with some promising results to date

- Artesunate-mefloquine combination for the treatment of uncomplicated malaria in African children versus artemether-lumefantrine
- Repeat administration of pyronaridine-artesunate, dihydroartemisinin-piperaquine, artemether-lumefantrine or artesunate-amodiaquine over a two-year period in children and adult patients with acute uncomplicated malaria
- Sub-lingual artesunate versus intravenous quinine in children with severe, complicated or uncomplicated malaria with gastrointestinal complications
- Comparing the safety, efficacy and pharmacokinetic profile of a new artesunate-amodiaquine co-formulation with an equivalent dose regimen of individual drugs to treat malaria. This trial led to the pharmaceutical production of the fixed formulation of artesunate-amodiaquine, used by several malaria control programme in Africa
- Efficacy of artesunate plus chloroquine for treatment of uncomplicated malaria in Burkinabé Faso children: a double-blind randomised, controlled trial
- Trailling of a novel component non-artemisinin-based combination therapy drugs
- Seasonal malaria chemoprophylaxis

The team at CNRFP has also been conducting investigations into a long-awaited malaria vaccine:

- The efficacy, safety and immunogenicity of heterologous prime-boost immunisation with candidate malaria vaccines ChAd63 ME-TRAP and MVA ME-TRAP in five-to-17 month-old infants and children
- Evaluation of immunogenicity, safety and reactogenicity of an adenovirus-type 35-based circumsporozoite malaria vaccine in Burkina Faso children aged 12-45 years old
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INTELLIGENCE

CAPACITY BUILDING AND INFRASTRUCTURE DEVELOPMENT – CENTRE NATIONAL DE RECHERCHE ET DE FORMATION SUR LE PALUDISME (CNRFP)

OBJECTIVES

To build and maintain a strong infrastructure for the Centre, and to use this infrastructure to conduct cutting-edge research and clinical trials into malaria in the region.

PARTNERS

International NGOs:
World Health Organization (WHO); European Vaccine Initiative (EVI); European & Developing Countries Clinical Trials Partnership (EDCTP); African Malaria Network (AMANET); Drug for Neglected Diseases Initiative (DNDi)

International cooperation:
National Institute of Health (NIH – US); Institut National de la Santé et de la Recherche Médicale (INSERM); Italian Development Cooperation; Statens Serum Institute (SSI)

International research centres:
Jhpiego, USA; London School of Hygiene & Tropical Medicine; Durham University; Liverpool School of Tropical Medicine; Imperial College London; University of Oxford, UK; Radboud University Nijmegen Medical Centre, The Netherlands; KEMRI Welcome Trust, Kilifi, Kenya; Université Cheikh Anta Diop Dakar, Senegal; University of Mali; Medical Research Council, The Gambia; Kintampo Health and Research Centre (KHRC), Ghana; Noguchi Memorial Institute for Medical Research (NMIMR), Ghana

Private partners:
GlaxoSmithKline; Pfizer; Sanofi; Novartis; ProtoPharma; Sigma-Tau Industrie

CONTACT

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