



SCIENCE GRANTING COUNCILS INITIATIVE IN SUB-SAHARAN AFRICA STRENGTHENING PARTNERSHIPS AMONG AFRICA'S SCIENCE GRANTING COUNCILS AND THE PRIVATE SECTOR

A BASELINE ASSESSMENT OF PUBLIC – PRIVATE PARTNERSHIPS IN RESEARCH AND SCIENTIFIC
COOPERATION IN SENEGAL

By

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Association of African Universities (AAU)

February, 2018



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Executive Summary

The Association of African Universities (AAU) conducted a baseline survey in Senegal on the state of partnerships between Senegal's Science Granting Councils (SGCs) and the private sector between 6 – 10 November 2017. The survey covered three key institutions, namely Direction Générale de la Recherche et d'Innovation (DGRI) of the Ministry of Higher Education and Research; Institut Sénégalais de Recherches Agricoles (ISRA); and Université Cheikh Anta Diop de Dakar (UCAD).

The (DGRI) is the state's SGC which disburses funds to inventors and identified public and private research institutions in Senegal. However, DGRI's current dispensation limits it to mere project funding and is therefore not responsible for project monitoring or dissemination of results.

On the state of private-public partnership (PPP), DGRI regrets having a near zero direct linkage with the private sector and holds the opinion that higher education institutions (HEIs) should develop their own agreements with the private sector without passing these through the Ministry of Education. On the other hand, Université Cheikh Anta Diop de Dakar (UCAD) has more than 200 international cooperation agreements all duly entered into through MOUs.

On knowledge transfer, researchers identified of inter-university collaboration on various academic disciplines for the purposes of staff exchange and theses supervision. These types of collaboration could be formal or informal, depending on whether the recipient institutions approached the Department or the researcher directly. A parastatal organisation in Senegal, Institut Sénégalais de Recherches Agricoles (ISRA) dedicated to agricultural research signs MOUs with all its partners.

DGRI's strengths into entering into PPP include its laid down procedures to administer funds and the existence of Science and Technical Committee to review projects for funding. UCAD and ISRA, giving their human resources and infrastructure seek to take advantage of partnerships for scientific research. However, some of the constraints include the lack of a Science, Technology and Innovation policy in Senegal to guide the national science agenda; limited funding from the State which are tailored to specific research themes; no policy guiding financing partnerships and research leading to inadequate research outcomes and information outlets; and lack of official recognition of individual research efforts.

To improve collaboration and knowledge transfers in Senegal, the survey recommended, among others, the passage of Senegal's STI policy to facilitate DGRI networking with other sectors and partners. Universities should intensify their monitoring roles on research and have proper structures in place/develop IPR policies that benefits both the universities and the researcher. The researchers recommended that HEIs in Senegal should establish an effective Commission of Research to organise departmental research and also focus on lab infrastructure to maintain quality staff in their institutions.

1. Introduction and objectives of the baseline

The Association of African Universities (AAU) commissioned a two-member team to undertake a baseline survey in Senegal on the state of partnerships in Senegal, with the following terms of reference:

- Determine the factors that constrain or promote public-private partnerships (PPP), scientific collaboration and knowledge transfer in Senegal
- Gather information on the Science Granting Council's (SGC) capacity needs and skills gaps for collaboration with other organizations, especially the SGC; and supporting research - productive sectors linkages
- Review the legal and policy frameworks and environment under which SGCs operate (institutional and national) in so far as support to PPP and CP is concerned

2. Methodology and limitations of the survey

The AAU team (Annex 1) visited Senegal on 6 – 10 November, 2017 and had deliberative sessions with 4 key institutions. By their understanding of the concept of a science granting council¹, the team classified the institutions as follows:

Table 1: Institutions in Senegal visited by the AAU Team

<u>Name of Institution</u>	<u>Classification</u>
Direction Générale de la Recherche et d'Innovation (DGRI), Ministry of Higher Education and Research	SGC (national)
Institut Sénégalais de Recherches Agricoles (ISRA)	SGC (parastatal)
Institut de Recherche pour le Développement (IRD)	SGC (international)
Université Cheikh Anta Diop de Dakar	University

¹Science Granting Councils, as defined by Johann Mouton, Jacques Gaillard and Milandré van Lill, are essential actors in national systems of innovation. In well-defined and clearly articulated systems of innovation, they perform a number of crucial functions that contribute to the effective and efficient functioning of such systems, amongst others: disbursing funds for research and development (R&D); building research capacity through appropriate scholarships and bursaries; setting and monitoring research agendas and priorities; advising on science, technology and innovation (STI) policies; managing bilateral and multilateral science and technology (S&T) agreements; and assessing the communication, uptake and impact of publicly funded research. Ideally, SGCs act as fair and disinterested agents of government while, at the same time, representing the interests of the scientific community nationally, regionally and internationally. They are crucial 'intermediaries' in the flow of international funding and technical support to R&D-performing institutions in a country.

The list of persons interviewed and their contact details is presented as [Annex 2](#). These eminent persons spoke in their capacity as either institutional heads or representatives of their institutions and/or as scientific researchers.

Despite efforts by the team to visit the Chamber of Commerce in Dakar for their perspective on the subject matter, both bureaucratic processes and time constraints did not allow any meeting to take place.

3. State of SGC collaboration in Senegal

The survey identified several forms of collaboration undertaken by the institutions visited in Senegal which are listed below under their various captions.

DGRI Collaborations

The *Direction Générale de la Recherche et d'Innovation* (DGRI) is the funding national body under the umbrella of the Ministry of Higher Education. It operates as the state's SGC mandated to collaborate with all sectors of the economy to achieve the science, technology and innovation agenda of Senegal. State funds received are disbursed to:

- Researchers
- Inventors
- Groups/teams
- Public and private Senegalese research institutions in identified priority areas

To DGRI, knowledge transfer is the overarching goal of every collaboration and this can be manifested in various forms, such as universities building human capacities for themselves as lecturers and researchers, and developing these human resources as skilled manpower to run other sectors (public, private and non-governmental organisations). DGRI therefore engages its partners in staff exchange programmes, collaboration on specific tasks and sharing of research infrastructure (e.g. research labs).

DGRI is of the belief that to develop capacity in higher educational institutions, government must prioritise physical infrastructure, particularly building and equipment. Hence a lot of funding has gone into infrastructural development (refer to "*Les Reformes: Bilan & Perspective*" published by the Ministry of Higher Education and Research in November 2016).

DGRI notes the existence of a dedicated scholarship, *Projet d'Appui à la Promotion des Enseignantes-chercheuses du Sénégal* (PAPES), earmarked for female lecturers, professors, scientists and PhD students for their career progression and scientific endeavours.

While all approved projects are funded by DGRI, collaborations with project researchers are through a Committee set up at the Ministerial level. The composition of this Committee varies but includes representatives from Government and the higher education sector. DGRI is therefore not responsible for project monitoring or dissemination of results. It has the human resources but its current dispensation limits it to mere funding of projects.

The DGRI has a near zero direct linkage with the private sector, which it agrees should not be the case. It holds the opinion that universities and other HEIs need to develop their own agreements with the private sector without necessarily passing these through the Ministry of Education or its directorates. The Director-General cited examples of companies that are directly supporting technical and vocational education and training, with technology giant, Samsung, supporting ICTs in universities while mobile telecommunication company, Orange is also supporting ICTs for students' innovation and research.

ISRA Collaborations

Institut Sénégalais de Recherches Agricoles (ISRA), is a parastatal organisation in Senegal dedicated to agricultural research. It has been in existence since 1974 and its researchers have same qualification as those from the mainstream universities - they go through the same CAMES evaluation guidelines. ISRA draws about 55% of its income is from the Government of Senegal (for salaries and funding of some projects) while the rest come from donors and through its fund-raising activities.

ISRA works in 5 major domains: Animal Production and Health; Vegetables and Post-Harvest Activities; Veterinary Research and Vaccine Development; Fisheries and Aquaculture; and Forestry and Scientific Research. It has strong bilateral collaborations with the universities in Senegal, as well as local agricultural associations. International bilateral collaborations on ISRA's focus areas are also extended to associations in Francophone West Africa, and in countries like Mauritania, Liberia, Equatorial Guinea and The Gambia, ISRA has established scientific centres to work in collaboration with institutions in these countries.

Some of ISRA's partnering institutions, besides the HEIs and research institutions in Senegal, are those that are either international in nature or work collaboratively with the private sector. These include:

- Fonds National de Recherches Agricoles et Agro-alimentaires (FNRAA)
- Académie Nationale des Sciences et Techniques du Sénégal (ANSTS)
- Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)
- Agence Nationale de Conseil Agricole et Rural (ANCAR)
- Institut de recherche pour le développement (IRD)
- Conseil Ouest et Centre Africain pour la recherche et le développement agricoles (CORAF)

ISRA signs MOUs with all its partners. With a team of 150 strong researchers, ISRA collaborates with the National Agricultural Research Centres of the universities and other research institutions on joint research. It is a net transferor of knowledge and has established presence in all the public universities and some private ones. Its researchers offer teaching at Master's and PhD levels as well as supervise student theses in these institutions. It also avails its laboratories to the universities.

The collaboration between ISRA and the private sector is basically on agribusiness (the development of phyto-technical products such as potatoes and maize) while with the public sector, the government taps into the institution's resources to implement its priority projects in agriculture.

IRD Collaborations

The Institut de recherche pour le développement (IRD – French Institute for sustainable development) was created in France in 1947 (headquarters in Paris then Marseilles) and established in Senegal in 1949. It has a current staff strength of 110, including about 45 researchers. IRD has very strong partnerships with universities, in the agricultural sector, and with NGOs in Senegal. Its researchers have partnerships with university laboratories for work on Agronomy, Social Sciences, Public Health, Geology, Oceanography, etc. and they also supervise PhD students. The Institute host 5 of 7 UCAD PhD Schools in a joint Campus in Dakar, where it has also made a significant impact as a net transferor of knowledge.

IRD signs formal MOUs with its partners though the contents vary vis-a-vis the specific engagements or terms of reference. For instance, there is an MOU with UCAD that is renewed every 5 years. The last review was in 2015 (an MOU was also signed with UGB). IRD has also a strong partnership with ISRA for all its agronomic research.

Additionally, IRD sign an MOU with the Ministry of Higher Education, Research and Innovation: researchers' assignments in Senegal must be approved by the Ministry before they can commence.

UCAD Collaborations

Université Cheikh Anta Diop de Dakar (UCAD) was officially established as University of Dakar in 1957 until renamed in 1987. It has six faculties, a polytechnic high school and five other specialised schools and centres. UCAD houses 7 doctoral schools, and had the following statistics in 2015-2016 academic year.

- 1,466 Teachers-Researchers
- 1,236 Administration Staff
- 77,436 Students Including 4101 PhD Students
- 16 Prestigious Research and Training Institutes
- 09 Institutes and Research Centres
- 117 Research Laboratories

UCAD sets up cooperation agreements based on the capacity needs of its various faculties and units and currently has more than 200 international cooperation agreements all duly entered into through MOUs. The purposes of these collaborations are varied and include research cooperation, and academic staff and students' mobility. A copy of a 2017 MOU between UCAD and Coastal Carolina University, USA is presented as [Annex 2](#). In the 2015-2016 academic year, UCAD received more than 4 million dollars directly from international development partners.

Within Senegal, UCAD has collaborative agreements with institutions like IRD and ISRA through the Ministry of Higher Education and Innovation. Its collaboration with the private sector is also weak and in so many ways, indirect. The more formalised ones are limited to certain academic disciplines, such as Biology, Chemistry, Engineering, ICT and Agriculture. The form of partnership vary. It can be internships for Masters and PhD students which may not be entered into through a formalised MOU, or a one-off intervention or donation. It could also be a formal partnership through an MOU (e.g. the School of Engineering has an MOU with private sector).

Research Collaborations

On the one side, while the university enters into numerous institutional collaborations through MOUs, on the other hand, many individual research scientists collaborated more on personal basis - many scientists resort to personal assistance from their alma maters in advanced countries for joint scientific research, use of laboratories, and PhD students' mobility. In the Physics Department of UCAD, for example, there are about 40 permanent staff many of whom go on exchange missions, normally to undertake a short-term research in a laboratory in France or a country in Europe where many of them undertook their Master's and PhD programmes.

Researchers identify another form of inter-university collaboration with UCAD as the net transfer of knowledge. The Physics Department of UCAD collaborates with other Physics Departments (e.g. Bambe and Thiers) of universities in the country for staff exchange and supervision of theses and dissertations. This leads to capacity building of the recipient institution. However, this type of collaboration may or may not be formal, depending on whether the recipient institutions approached the Department or the researcher directly.

3.1 State of PPP collaboration

All interviewed institutions strive for PPP collaborations.

The Ministry of Higher Education and Research and Innovation initiates national projects and calls on development partner such as ACBF, EU, RFI, AFD, ISRA, Virtual Universities to select aspects they can fund. Additionally, the Ministry places annual Call for Proposals on selected thematic areas which are funded through DGRI.

UCAD, on the other hand enters into partnerships to take advantage of the technology and scientific outputs of these partners while respecting their intellectual property rights.

IRD enters into partnerships for concrete results that can influence public policy while ISRA has worked effectively with other collaborators and can boast of the development of over 30 vaccines.

4. Factors constraining and enabling collaboration and knowledge transfer between SGCs

Strengths of the SGCs

To DGRI, the availability of funds by the State ensures that activities are undertaken yearly. Other strengths identified by DGRI are the establishment of procedures to administer the funds and the existence of a Scientific and Technical Committee to review and approve projects for funding.

IRD and ISRA have the human resources and the infrastructure to conduct scientific research for effective dissemination. Outcomes of scientific research outcomes are on their respective websites.

Constraints Identified

DGRI

The organogram of the Ministry of Higher Education and Research has the Ministry at the apex and beneath this are the Directorates, including DGRI (see [Annex 4](#)). The linkages between the Directorates of the Ministry and the universities are weak, and while the research institutes are independent of the Ministry, the private sector has no motivation in working with the institutions. These are because there are no direct overtures from the universities to the private sector for partnerships. Examples are that prototypes from universities are not showcased nor are their websites displaying enough content of their research outputs.

Senegal currently does not have a policy on Science, Technology and Innovation which constraints it to pursue a more purposeful collaboration with other sectors of the economy. Confronted with the need for a national research policy for socio-economic development, the Research and Scientific Planning (RSPD) Directorate of the Ministry of Higher Education, Research and Innovation with the support of the AECID, UNESCO and the World Bank has developed a draft STI policy from Senegal. A technical committee was set up in December 2016 and has formed working groups around priority areas.

The limited funding from the State is tailored to specific thematic areas, which means that DGRI cannot fund numerous projects it would have wished to do so.

There is currently no policy guiding financing partnerships and research. DGRI has financed a lot of research projects but has little to show in terms of outcomes. These outcomes are given to thematic groups and scientific committees despite DGRI financing all of them. In essence, monitoring of research is the main problem at DGRI.

Researchers, because of academic promotion and other reasons, do not disseminate their results to DGRI but to *Conseil Africain et Malgache pour l'Enseignement Supérieur (CAMES)*, a higher education coordinating body of French-speaking countries of Africa and Madagascar accorded governmental assent in each of the 16 French-speaking states of Africa and the Indian Ocean. Information sharing of research outcomes is therefore virtually non-existent.

ISRA

ISRA, like DGRI, is not able to directly disseminate research results because these are handled by the National Extension Services which is not under the aegis of ISRA.

IRD

To IRD, academics produce theoretical results which are not very useful research outputs.

It also notes that since between 60 – 70% of students are in the humanities, it makes it difficult to build interesting projects for the Chamber of Commerce.

Universities

Delay in administrative procedures and sometimes non-compliance with deadlines is a key constraint.

Researchers

Lack of official recognition from their individual research efforts by their universities is very a demotivation to them. An example was cited of a researcher in one of the Science departments who has developed a patent with foreign collaborators but this is unknown to the university because of the lack of structures to and institutional framework to follow.

There is no effective Research Coordinating Unit that will serve as a one-stop centre for scientific researchers and eventually help them in patent application and dissemination of research outcomes.

The researchers point out that at the university, there is no intra- and interfaculty collaboration for synergies to be built among the researchers and among the various departments.

Relatedly, there is no good interface for communication in real time within the university. This is in view of the fact that there may be partnerships unknown to many lecturers because there is no platform for such engagements. In other scenarios, information passed on may either not be regular or may be outdated. This assertion was confirmed by the officer responsible for International Relations, who indicated that he endeavours to put out all collaborations on the UCAD website.

Researchers note that the African lecturer is generally not lazy but is constrained. Beyond the lack of infrastructure, there is an additional burden of teaching large classes that stifles time for research. The Physics Department of UCAD, for instance, has only 40 lecturers to handle about 7,000 students in the current 2017/2018 academic year.

The researchers did not identify any institution-wide policy on intellectual property rights (IPR); there was an acknowledgement of some form of research ethics policies. If an IPR policy ever exists, this is not either known to the researchers, or is not operational.

5. Recommendations

From the point of view of researchers, UCAD, and for that matter other HEIs in Senegal, the Government should establish an effective Commission of Research to organise departmental research, create a database of research topics, research groups, laboratory equipment, etc. and have each Department develop a Strategic Plan that fits into the university's and national Development Plan.

Additionally, researchers suggested that there is a need to work on the communication structure within the university through an effective Management Information System (MIS)

To maintain quality staff, the UCAD Council should focus on infrastructure for the labs as a matter of urgency, as well as recruit more academic staff to free teaching burden on existing staff so that they can undertake more meaningful research.

DGRI calls for a facilitation of the review and passing of the STI policy to guide its programme and project implementation, and networking with other sectors and partners. It also needs the mandate to monitor projects so that disbursement would go with evidence of concrete results achieve under each project.

The university should intensify its monitoring role on research and have proper structures in place/ develop IPR policies that benefit both the universities and the researchers.

The overall effect is increased visibility of the university, the researcher and the research outcome(s), leading to the attraction of more funds through enhanced partnerships and more intake of international students.

Annexes

Annex 1: AAU Team

Mr. Ransford Bekoe and Mrs. Bunmi Odufala

Annex 2: Institutions and individuals visited in Senegal

<u>Name of Institution</u>	<u>Contact Person</u>	<u>Position in Institution</u>	<u>Email address</u>
Direction Générale de la Recherche et d'Innovation (DGRI), Ministry of Higher Education, Research and Innovation	Pr. Amadou Thierno GAYE	Directeur Général	amadouthierno.gaye@mesr.gouv.sn ; atgaye@gmail.com
Direction Générale de la Recherche et d'Innovation (DGRI), Ministry of Higher Education, Research and Innovation	Mr. Tasfir NDOYE	Directeur du Finance	ndoyetasfir@hotmail.fr
Institut Sénégalais de Recherches Agricoles (ISRA)	Dr. El Hadji TRAORE	Directeur Scientifique & Maître de Recherches	elhadji.traore@isra.sn ; elhtra@yahoo.fr ; eltraore@coraf.org
Université Cheikh Anta Diop de Dakar	Mr. Abdoulaye NIANG	Chef de Division, Coordonnateur des Bourses/Responsable Mobilité Internationale	abdoulaye.niang@ucad.edu.sn
Université Cheikh Anta Diop de Dakar	Pr. Oumar KA	Prof. of Physics, Faculty of Sciences and Technology	oumar.ka@ucad.edu.sn
Université Cheikh Anta Diop de Dakar	Dr. Serigne Bira GUEYE	Assoc. Prof, Department of Physic, Faculty of Science and Technology	sbirag@gmail.com

Annex 3:

Les activités de l'UMR URMITE - Unité de Recherche sur les Maladies Infectieuses et Tropicales Emergentes (IRD, CNRS, INSERM, Aix-Marseille Université)

Intitulé du programme principal de recherche :

Paludisme et maladies infectieuses émergentes en Afrique de l'Ouest: détection, épidémiologie et lutte

Modalité de mise en œuvre

Les recherches sur le paludisme et les maladies émergentes au Sénégal s'appuient sur six plates-formes de surveillance sanitaire et démographique ou observatoires de population et de santé (Dielmo, Ndiop, Niakhar, Mlomp, Bandafassi et Bambey/Mbour/Fatick). Ces plates-formes sont des lieux d'étude et d'évaluation de l'effet des actions entreprises pour la lutte contre le paludisme et les maladies infectieuses en termes de mortalité comme de morbidité. Il est donc impératif de poursuivre ces études épidémiologiques, entomologiques et immunologiques sur les maladies infectieuses afin d'évaluer les stratégies de lutte actuellement disponibles et de détecter rapidement tout changement notable.

Au Sénégal, plus d'un trentaine d'agents développent les différentes actions de recherche de l'Unité, qui est la plus grosse implantation secondaire des 18 unités (03 UMI, 14 UMR, 1 US) présentes au Sénégal. L'unité est également impliquée dans la formation des étudiants et techniciens des pays partenaires. Les activités de recherche et de formations sont optimisées par la mise en place d'un système QHS (Qualité-Hygiène-Sécurité) au sein de l'unité.

Principales actions de recherche

Impact des nouvelles stratégies de lutte contre le paludisme sur la morbidité à Dielmo et Ndiop

Projet piloted' élimination du paludisme au Centre du Sénégal,

Identification des agents pathogènes responsables de fièvres au Sénégal et mise en œuvre d'interventions pour lutter contre ces pathogènes,

Dynamique de transmission saisonnière de la schistosomiase à *S. haematobium* à Niakhar,

Impact des nouvelles stratégies de lutte sur la mortalité : Analyse des causes de décès et de la mortalité au Sénégal,

Intérêt de l'hygiène corporelle dans la prévention des maladies infectieuses en milieu rural au Sénégal (PROJET SAVON),

Traitement des malades fébriles non palustres au Sénégal avec la doxycycline en dose unique en comparaison avec l'amoxicilline,

Acceptabilité des auto-prélèvements vaginaux et applications à la recherche de causes infectieuses d'avortement au Sénégal,

Ampleur et conséquences de l'infection chronique par le virus de l'hépatite B (VHB) dans un pays d'Afrique de l'Ouest à forte endémicité (Sénégal),

Vaccination néonatale contre l'hépatite B en Afrique (NéoVC),

Analyse de la composition et de la dynamique du microbiote intestinal chez les enfants de 0-59 mois avec une malnutrition aiguë sévère avant et après renutrition et sur la composition du lait maternel au Sénégal,

La lutte contre la borréliose à tiques au Sénégal et en Afrique de l'ouest,

Projet Grand Magal de Touba.

Partenaires au Sénégal

3 unités de l'Institut Pasteur de Dakar (Epidémiologie, Immunologie et Entomologie)

Service de Parasitologie-Mycoologie, UCAD (Pr O Gaye, Pr B Faye, Pr JL Ndiaye, Pr Th Dieng...)

Laboratoire d'Ecologie Vectorielle et Parasitaire, UCAD (Pr O Faye, Dr L Konaté)

Département de Biologie Animale, UCAD (Pr M Sembène, Pr Ng Faye, Pr M Ndiaye)

Département de Sociologie, UCAD (Pr S Faye, Dr T Ndoye)

Université Gaston Berger de Saint-Louis, Département de Mathématique (Pr A Diongue, Pr Diop)

Agence Nationale de l'Aviation Civile et de la Météologie du Sénégal, ANACIM (Dr O Ndiaye)

Centre de Suivi Ecologique du Sénégal (Dr JA Dione)

Agence Nationale de la Statistique et de la Démographie du Sénégal, ANSD (Dr CT Ndiaye)

Centre National Hospitalo-Universitaire (CNHU) de Fann du Sénégal (Pr CT Ndour, Pr M Seydi)

CNHU Le Dantec du Sénégal (Pr Mboup, Pr D Ndiaye, Pr CT Kane, Pr T Dieye)

Programme National de lutte contre le Paludisme du Sénégal (Dr M BA, coordinateur et son équipe)

Université Alioune Diop de Bambey (Pr L Gueye)

Contributions à la formation

11 étudiants en Master II, 7 doctorants et 2 postdoctorants

Participation aux enseignements de trois Master II (Entomologie médicale, Parasitologie et Génétique des populations de l'UCAD).

Principaux résultats

L'IRD a décrit l'émergence et l'évolution de la résistance à la chloroquine au Sénégal, la seule étude africaine qui a documenté l'augmentation de la mortalité palustre chez les moins de 5 ans. Toutes ces données sur la résistance à la chloroquine ont participé au changement de traitement de 1^{ère} ligne des accès simples dès Juin 2003 avec l'introduction des ACTs au Sénégal.

L'IRD a instauré le traitement préventif intermittent chez les enfants de moins de 5 ans au Sénégal en 2002 pour les protéger du paludisme pendant l'hivernage. On note 86% de réduction de la morbidité palustre. Cette stratégie a été validée par l'OMS en mars 2012 pour la protection d'enfants africains vivant dans le Sahel. Le coût financier de cette stratégie est 0,41 dollar par mois par enfant.

Entre 2007 et 2008, a été mené un essai clinique sur la méningite pour comparer la tolérance et l'immunogénicité d'un vaccin conjugué anti-méningococcique A et d'un vaccin polysaccharidique ACYW administré chez les sujets sains âgés de 2 à 29 ans » 2007-2010. Plus de 200 millions de personnes ont été vaccinées avec ce vaccin conjugué depuis la pré-qualification par l'OMS en 2010 dans la ceinture de la méningite.

MOOC sur le paludisme : présenté par des experts francophones de renommée mondiale, il est complètement gratuit et est destiné à tous les publics intéressés par cette thématique, aussi bien les étudiants, les médecins, les chercheurs que le grand public. Le but de ce cours est de répondre à toutes les interrogations que soulève le paludisme. Il s'agit de faire un véritable état des lieux de la maladie, du parasite, du moustique, des traitements existants, les moyens de lutte, les précautions à prendre avant de voyager en zone d'endémie, les avancées de la recherche et sur les vaccins.

Le Grand Magal de Touba au Sénégal, l'un des plus importants rassemblements religieux d'Afrique où converge 4 à 5 millions de fidèles vers ce lieu saint situé à 180 km au nord-est de Dakar est un lieu de promiscuité infectieuse. Grâce au registre des consultations et des actes de soins effectués dans les structures de santé de la région, nous avons pu évaluer le nombre et l'importance relative des pathologies rencontrées durant le pèlerinage de 2015.