



**A Network for the Coordination and Advancement of Sub-Saharan Africa-EU Science and Technology Cooperation**

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**REPORT OF AN EXPERT WORKSHOP ON NON-COMMUNICABLE DISEASES**

**4-5 November 2009**

**Yaoundé, Cameroon**

**A research prioritisation exercise to identify researchable topics of mutual interest**

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## **TABLE OF CONTENTS**

TABLE OF CONTENTS	2
1. BACKGROUND	3
2. DISCUSSION ON WORKSHOP TOPICS	6
3. GENERATION OF RESEARCH TOPICS	13
CONCLUSION	21
REFERENCES	23
ACKNOWLEDGEMENTS	24
ANNEX 1: LIST OF PARTICIPANTS	25
ANNEX 2: LIST OF FP7 CALLS OF THE COOPERATION WORK PROGRAMMES HEALTH	27
ANNEX 3: HEALTH RESEARCH FOR NON-COMMUNICABLE DISEASES IN SUB-SAHARAN AFRICA	34

## 1. BACKGROUND

### **The problem of non-communicable diseases (NCDs) in Africa**

One of the consequences of globalisation is economic transition and epidemiological transition, i.e. concomitant burdens of communicable diseases and non-communicable diseases (NCDs). The global importance of NCDs (including cardiovascular disease - heart disease and stroke - diabetes and some cancers) is shown by the fact that together they now account worldwide for up to 60% of deaths, and almost half of all 'premature' deaths (Daar et al 2007). The World Health Organisation (WHO) predicts that globally, deaths due to NCDs will increase by 17% over the next decade, with the greatest increase in the African region (27%) (WHO 2008). Yet in sub-Saharan Africa, governments, donors and research-funders have channeled most resources into infectious diseases, especially the trio of HIV, malaria and tuberculosis; and initiatives such as the European and Developing Countries Clinical Trials Partnership (EDCTP) have been focused on treatment and healthcare services for these infections rather than the needs and opportunities for prevention through public policy and changing lifestyles.

Recent favourable developments for NCDs, however, include the WHO Global Strategy for the Prevention and Control of Noncommunicable Diseases (WHO 2008) and the establishment by WHO, the World Bank, the World Economic Forum, and three international NGOs (the World Heart Federation, International Diabetes Federation and the International Union against Cancer), of a global NCDs network (NCDnet) to spread initiatives on NCDs. The network will join health-care and preventive approaches, and also enable research on interventions at primary care level (Maher 2009).

A number of events over the past decade have raised the profile of health research in Africa. The Abuja Declaration and Plan of Action from the African Summit on Roll Back Malaria in 2000 catalysed concern for both interventions and research for health. The New Partnership for Africa's Development NEPAD (2009), created in 2001 under the auspices of the Organisation of African Unity, and recognises the contribution of health in supporting economic development in Africa. The Joint Africa-EU-Africa Strategy, adopted at the Lisbon EU-Africa Summit in 2007, comprises eight thematic partnerships, including one for Science, Information Society and Space. In addition to partnership 8, partnership 4 also covers health, but in the context of MDG targets. The Global Ministerial Forum on Research for Health in Bamako, Mali in 2008 affirmed the importance for Africa of health

research. These recent developments in health research in Africa are favourable in supporting NCDs research<sup>1</sup>.

### **CAAST-Net and the European Union's Seventh Framework Programme (FP7)**

CAAST-Net is a coordination action funded by the Capacities Programme of the European Commission's Seventh Framework Programme for Research (grant agreement 212625). CAAST-Net is an INCONET supported under the Capacities Specific Programme of the European Union's Seventh Framework Programme (FP7). CAAST-Net's goal is increased African participation in the Framework Programme through enhanced cooperation in Science and Technology between Europe and Africa.

CAAST-Net undertakes activities of research prioritisation through experts' workshops held in African countries which aim to identify researchable topics areas of mutual interest to both European and African researchers.

Workshops take place in consultation with the participation of the relevant EC directorates, in order to maximise opportunities for cooperation and exchange. Accordingly, on 19<sup>th</sup> September, 2008, CAAST-Net and Directorate K representatives held a meeting in Brussels at which the international cooperation dimension of the health work programme was explained in general terms, as well as the specific interest of Directorate K in cooperation with Africa.

Directorate K indicated their support for research concerning non-communicable diseases (NCDs) given these are accorded a low priority despite the huge number of affected people. Africa's increased burden of NCDs will be driven by sharp increases in the prevalence of diseases such as cancer, obesity, diabetes, and cardiovascular disease (CVD). General priorities highlighted by Directorate K in the context of cooperation with Africa include:

- Non-communicable diseases
- Public health

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1 Kalua, F.A., Awotedu, A., Kamwanja, L.A. and J.D.K. Saka (eds). 2009. Science, Technology and Innovation for Public Health in Africa. Monograph, NEPAD Office of Science and Technology, Pretoria, Republic of South Africa.

### **Health Thematic Workshop**

A two-day health workshop was held at the offices of the “Institut de Recherche pour le Développement” in Yaoundé, Cameroon on 4 and 5 November 2009. Nineteen experts in NCDs and public health from Europe and Africa participated in the meeting. The expertise of the participants reflected the focus of the health workshop on diabetes, cancer and cardiovascular disease.

,The discussion during the working sessions establishing the frame of Specific International Coordination Actions (SICAs) in Non-Communicable Diseases theme among the experts, the DG Health Representative and CAAST-Net partners, was based on an experts’ brainstorming ahead of the workshop .

Prior to the consultation, experts and stakeholders were asked to submit short abstracts on potential research issues, and 17 of these were received and considered within the consultation. The objective of the meeting was to recommend broad areas for research for the three NCDs (cardiovascular disease, cancer and diabetes) identified as having particular relevance for Africa-Europe collaboration, and for integrated approaches to these NCDs. The process of consultation in the workshop did not seek to be exhaustive of knowledge and research initiatives on the topics. Consideration of the specific proposals submitted in advance served to initiate discussion, resulting in the identification of broad topics to be considered and further elaborated for inclusion under the health theme in future FP7 calls. This report records the evidence and discussions of the group over the two days.

## 2. DISCUSSION OF WORKSHOP TOPICS

### 2.1 Diabetes

#### Background

The prevalence of diabetes is increasing worldwide, however in Africa the projected rate of increase is greater than elsewhere. WHO projects that the number of cases will rise from 9.1 million in 2000 to 28.3 million cases in 2030, a rise of 211%. These figures are thought to be conservative. There are estimated to be 12 million people with diabetes in Africa, and the numbers growing by 1 million every two years. The increasing problem of diabetes in many European countries has accompanied increases in obesity. Most explanations for the rising prevalence of diabetes in sub-Saharan Africa reflect lifestyle changes due to globalisation and urbanisation, with more affluent sections of society becoming more sedentary and overweight. More comprehensive and representative data in Africa are urgently needed. One participant reported that a study site in Cameroun showed a prevalence of type 1 diabetes of 0.6%, with a prevalence of impaired glucose tolerance ("near diabetes") of up to 6%.

From the pre-consultation proposals and workshop discussions on diabetes, the following issues were noted as important areas for further exploration:

- Generally, diagnosis of diabetes in Africa occurs at a late stage of the disease and often at a point when organ damage becomes apparent. As a consequence there is a higher risk, for example, of diabetes-related retinopathy and nephropathy.
- Genetic polymorphisms predisposing the population to insulin resistance.
- Changes in behaviour (diet, sedentary lifestyle) due to rapidly increasing urbanisation.
- The general classification of diabetes is as either type I or type II. However, in Africa the situation is complicated by reports of potentially important environmental factors, e.g. related to iron overload, associated with high iron content in soils.
- High African immigrant populations in Europe for whom 'Western' diabetes diagnoses and treatments may be less well validated.
- These immigrant populations tend to be urban and have been exposed to rapid changes in lifestyle and diet.

- The genetic variation in the African population is greater than in Europe and allows a broader understanding of the use of genomic studies in the diagnosis and treatment of diabetes.
- The need in Africa to develop more affordable tests and treatment regimes will have positive implications for the European and African pharmaceutical industry.
- Partnership for improving health as a universal human right.

In addition to factors favouring susceptibility to diabetes, there are additional problems related to diagnosis and treatment:

- In many areas of Africa, the number of diabetes specialists is very low, for example in Mali there are only two in the entire country. This situation requires diabetic patients to travel long distances for diagnosis, monitoring and treatment.
- Standard tests based on the glycemic index are unreliable when the frequency of testing is low as may be the case in remote regions. At the same time, the alternative diagnostic test based on HbA1c may be unreliable in a significant proportion of the population of Africa due to changes in haemoglobin structure resulting from an adaptation to malaria. Experts discussed the effectiveness, affordability and use of the HbA1c test relative to the glycemic index test.
- Certain criteria used in the West to predict a predisposition to diabetes such as waist circumference, body mass index (BMI), and birth weight are not necessarily appropriate, or have different interpretations in an African context. As an example, the slope of the regression of waist circumference against diabetes differs between rural and urban populations in Africa. The point was made by experts that for many NCD diagnostic criteria the cut-off points differ between European and African populations, but also within Africa because of the wide genetic diversity.

## **2.2 Cancer**

### *Background*

In 2020, more than 10 million people worldwide could die of cancer. In Africa, the most common cancers are due to infectious agents, lifestyle and genetics factors. To implement key strategies, emphasis has to be placed on promoting integrated health research and improving national capacities, improving research activities in innovation, reinforcing human capacities, and addressing aggravating factors such as tobacco, alcohol and lifestyle issues. Interdisciplinarity and comprehensiveness (from prevention to research, and

from training to research equipment and infrastructure) are key elements to be considered.

While WHO's leadership has helped to increase attention to cancer worldwide, there has been significant progress in raising the profile of cancer in Africa, including the systematic description of what is currently known (Ly and Khyat, 2006). In addition to cancers which are common in both Europe and Africa, e.g. cancers of the breast, colon, lung and prostate, there are significant impacts in Africa of cancers strongly associated with viral infection, e.g. cancer of cervix, and Kaposi sarcoma.

CARISA (2008) reported the 'landscape' of cancer research of South Africa. Cancer research support includes data management, diagnostics (biomarkers, genomic profiling, and imaging techniques), prevention, treatment, and palliation and social aspects. But their main areas proposed for research included molecular carcinogenesis, genetic and molecular epidemiology, and therapeutic development.

However, while there is much interest in the links between genetics and cancer, Africa has the most diverse gene pool in the world, limiting the feasibility of epidemiological studies. Moreover, as yet no-one has identified human protein markers, and proteomics is beyond the financial resources of most African countries.

There is an urgent need to improve diagnostic services, including the evaluation of diagnostic innovations such 'telepathology' (as there are very few pathologists in Africa) and to improve treatment services, including the provision of common anti-cancer drugs and morphine for palliation.

Cultural factors for investigation include the possible protective effects of diet against cancer (e.g. the drinking of Rooibos tea in South Africa, and maize as a factor in the reduced prevalence of colon cancer among black compared to white South Africans).

Knowledge is needed to support ministries of health in developing evidence-based policies for the implementation of interventions which are widely available or are being widely introduced in Europe but which are not yet available in Africa. For example, cost-benefit and health policy studies are needed on the impact of human papilloma virus vaccination and cervical cancer screening programmes on cervical cancer prevention. Public demand also needs consideration - what do people want?



For the purpose of the workshop, the experts were requested to identify specific issues related to the population of Africa, to propose possible responses and goals to work towards.

From the pre-consultation proposals and workshop discussions on cancer, the following issues were noted as important areas for further exploration:

- Training oncologists:
  - Medical and radiation oncology in the different African regions (for example, in West Africa, surgical oncology training is available in Dakar and medical oncology training available in Brazzaville)
  - Access to cancer literature
  - Post doc training for senior oncologists
- Conception of a cancer plan model to be implemented in every African country
- Cultural approach through diet and use of plants in treatment:
  - Prevention of colon cancer
  - Rooibos tea and glutathione enhancement
  - Search for novel anti-cancer drugs
  - Role of indoor carcinogens
- Aetiology & genomics (global forum):
  - Role of indoor smoke from cooking and heating fires
  - European and African differences for genetic susceptibility
- Oncogenic viruses and cancer:
  - Specific patterns of distribution of oncogenic viruses and cancer in Africa
  - European/ African differences for vaccination campaigns
  - Needs of adapted and low cost vaccines
  - Vaccine efficiency
  - Virus and breast cancer
- Diagnosis of lymphoma, e.g. telepathology (with extension of tediagnosis to other tumour types);
- Healthcare systems improvement, EBPNNet Network;
- Public health approaches to prevention (especially regarding alcohol and tobacco);
- Protection for workers and work medicine insurance;
- Dissemination of information for Health Ministries to permit adapted approaches depending on the regions;
- Data management:
  - Reinforce the database networks (IARC in Lyon, France / OMS for Africa, e.g. Problems about data collection) and database management, especially cancers register in Africa

- Creation of an African network to support database management, especially cancers register
- Legal frame for national register of cancers needed and to adhere to ethics and international standards
- OMS: problems about data collection
- Develop an African tumour bank:
- South African experience;
  - Data / database management and cancer surveillance
  - Prevention
  - Diagnostics
  - Treatment & palliative care
  - Social aspects
- Socio-cultural issues;
  - Patient healthcare handling during the painful steps: pain management and palliative care
  - Medicine access
  - Colon cancer affects more frequently Caucasian populations
  - As well as melanoma because of excessive exposure to sunlight
  - Raise cancer awareness
  - Why do patients present late? Behavioural research on cancer perception

### **2.3 Cardiovascular Diseases**

#### *Background*

Preliminary data indicate that the burden of cardiovascular disease in Africa is growing, and contributing conditions, such as diabetes and obesity, are also increasing rapidly. There is an urgent need for more comprehensive and representative data to better define this burden across Africa. Specific aspects of CVDs were considered in Africa, including the wide population distribution of hypertension and its impact, e.g. nephropathy and cardiomyopathy.

While known risk factors have an important place, there is no equivalent of the Framingham longitudinal study providing data about populations and factors of disease progression for Africa. Areas of further investigation could include salt sensitivity and arterial stiffness – which may have genetic components. Since malnutrition rather than dietary excess continues to be a pressing problem in rural Africa, low birth weight may be an important determinant of cardiovascular diseases in later age for people moving to towns and cities and taking up western lifestyles.

Cultural, ethnographic and geographical analyses are important, since there may be differences between western and African concepts of health and disease. Cultural attitudes towards obesity, for example, may have marked differences within and between continents, such that in some societies obesity may be seen as a sign of wealth and feature of beauty.

There is a lack of representative information within countries, and insufficient information on differences between countries. There is a need for the development of structures for gathering information, networks to share data and support analysis, and better use of information to provide health ministries with the evidence base for developing new approaches. At local level, systems developed for HIV treatment and monitoring could form the basis for the development of shared disease and treatment registries. These data, when linked to differences in cultures, are also of great interest to social scientists.

Areas of concern include how to organize the health system to provide an effective response to the challenges posed by cardiovascular disease, the evaluation of cost-effectiveness of different means of care delivery, and the provision of the related social support programs needed. Developments need to be adapted to the population, including for example innovations in diagnostic tests, outreach support through tele-medicine and appropriate medicaments, with the value determined by cost-effectiveness studies.

From the pre-consultation proposals and workshop discussions on CVD, the following issues were noted as important areas for further exploration:

- Hypertension, diabetes, lifestyle (smoking, diet, physical activity), raised cholesterol and dyslipidaemia,
- CVD including coronary artery disease, cerebrovascular disease, and peripheral arterial disease, nephropathy and retinopathy,
- Cardiomyopathies - perinatal, hypertensive, right ventricular,
- Cost-effectiveness of interventions,
- Affordability and accessibility,
- Interventions - opportunities and opportunity costs.

## **2.4 Integrated approaches to NCDs**

In addition to the research topics identified for each specific NCD, research is also relevant to the NCDs collectively, since they share common risk factors, interactions, and similarities in approaches to prevention and care.

Common risk factors such as obesity, diabetes, and hypertension contribute to cardiovascular disease, and to the complications of cardiovascular disease. The delivery of health service interventions for prevention and care, and the often multisectoral policies aimed at preventive measures, contribute to reduction of all of these diseases. Since important social and cultural perspectives may be relevant across different NCDs, studies of prevention and clinical management should address NCDs as a group. This can be more efficient, avoiding duplication of effort, e.g. developing a standard approach to registration and follow-up of patients, and developing policies for prevention based on shared risk factors.

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### 3. GENERATION OF RESEARCH TOPICS

#### 3.1 Diabetes<sup>2</sup>

Topic 1: Health care delivery in diabetes

*Description of the topic:*

Studies are required to investigate alternative approaches to implementation of diagnosis and treatment which are closer to the patient. Studies should consider affordable diagnosis, case-screening / monitoring and early detection of end-organ damage (for reducing the burden of disease and service planning, e.g. foot-care problems). This requires a multidisciplinary structured approach to care, taking account of community settings, with an enhanced role of non-medical staff. At the same time standardized and improved data capture is seen as essential to build and contribute to national, regional and international databases for improved health care planning and evidence based policy making.

*Tools:*

Collaborative projects (several)

*Expected impacts:*

The research undertaken in this topic will have the following impact:

- Increased accessibility and quality of care
- Slowed progression to complications
- Better data for planning and provision of services

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<sup>2</sup> Diabetes topics were incorporated into the health 2011 calls:

- 2.4.3 HEALTH.2011.2.4.3-3: Molecular and physiological effects of lifestyle factors on diabetes/obesity.

Collaborative Project (small or medium-scale focused research project). Requested EU contribution per project: Maximum EUR 6 000 000. One or more proposals can be selected.

- 2.4.3 HEALTH.2011.2.4.3-4: Genetic and environmental factors in obesity and/or diabetes in specific populations.

Specific International Cooperation Action (SICA), Collaborative Project (small or medium-scale focused research project) target regions: Mediterranean countries, Africa, Asia Latin-America). Requested EU contribution per project: Maximum EUR 3 000 000. One or more proposals can be selected.

## **Topic 2: Diabetes and epidemiological transition in Africa**

### *Description of the topic:*

As recognised by the WHO, Africa is experiencing a transition in the epidemiology of diabetes dictating the need for an important research effort. Coordinated studies are required of the prevalence and trends of diabetes in different settings, of the impact of migration (resulting particularly in increased urbanisation and changes in human environments), and other consequences of globalisation which may affect human behaviours and contribute to increased risk of diabetes.

Studies on insulin resistance arising from adaptation to situations of rural malnutrition are crucial to understand and treat diabetics for populations migrating to urban settings and experiencing dietary transition. These studies should, in the view of experts, be conducted on a multigenerational level because of the nature of predisposing factors to insulin resistance (e.g. low birth weight and reduced stature).

In a more general manner studies need to be undertaken to understand and assess the implications of dietary transition in Africa and the barriers and resilience of communities to adaptation for prevention of diabetes. These studies should include maternal and early infancy risk factors in the development of type 2 diabetes in Africa. Maternal determinants of risk of diabetes may include, for example, hypertension, multi-parity and placental pathologies. Individuals in whom nutrition was inadequate in the pre-natal, infant and young child stages of development may be at increased risk of adult obesity because of the nutritional consequences of exposure to high-fat, energy-dense, micronutrient-poor foods and lack of physical activity.

### *Tools:*

Collaborative projects (several)

### *Expected impacts:*

The research undertaken in this topic will have the following impact:

- Improved information for health care planning
- Early detection of at-risk offspring
- Improved knowledge on diabetes and epidemiological transition in Africa
- Evidence based policies on urbanization and diabetes

## **Topic 3: Biotechnical approaches to aetiology of diabetes**

### *Description of the topic:*

New biotechnological approaches to aetiology of diabetes are being used in western countries. These approaches must remain a research priority as recent evidence suggests that aetiology needs to be used for prevention. Large international collaborations will be required to make progress in such important research areas.

Research should be undertaken in partnership in Africa with a view to long-term commitment including basic research–clinical intervention studies and biotech initiatives on the following themes:

- Genetics, insulin resistance, blood markers
- Animal models
- Environmental factors (e.g. soil / iron). Development of biotechnical tests to screen the population with a high level of iron in blood.

*Tools:*

Collaborative projects (several)

*Expected impacts:*

The research undertaken in this topic will have the following impact:

- To improve diagnosis of diabetes and enable effective targeted treatments
- Better understanding of aetiology opens up future avenues for novel prevention strategies

### **3.2. Cancer**

#### **Topic 1: Approach to aetiology of the most common cancers**

*Description of the topic:*

An approach to aetiology is proposed, through studies using variations in sub-Saharan Africa of incidence of the most common cancers. Epidemiological studies can capture the differences in environment, distribution of oncogenic viruses, lifestyle (including diets), and genetic markers which underpin the variations in prevalence of different cancers. This study can be carried out in migrant populations and enable a wider understanding of disease processes and natural history.

*Tools:*

Collaborative projects (several projects)

*Expected impacts:*

- Better knowledge of risk factors
- Inform the development of interventions

- Help to decision makers, better healthcare planning

### **Topic 2: Models of healthcare delivery for people with cancer**

#### *Description of the topic:*

Research is needed at different points in the pathway of care, from diagnosis to treatment and palliation. Studies are needed on the effective organisation of services, such as telepathology (identification of lymphoma which is chemosensitive) and palliative care (pain control). In addition, cost-effectiveness and equity of access, e.g. in provision of radiotherapy, should be taken into consideration. The study leads to the conceptualization of models of delivery of care for targeted populations. This project aims to promote health as a human right.

#### *Tools:*

Collaborative projects (several projects)

#### *Expected impacts:*

- Improved care of people with cancer
- Decreased morbidity and mortality
- Decreased socioeconomic impact
- Improved quality of life

### **Topic 3: Scoping the field of diagnostics including emerging techniques and affordable approaches**

#### *Description of the topic:*

This approach includes an overview of the current available diagnostics and diagnostics in the pipeline, taking into consideration wide variation of cancer aetiology and outcomes. It would need to define population references values and the evaluation of test performance diagnosis.

#### *Tools:*

Coordination and support action

#### *Expected impacts:*

- Share the knowledge for choosing appropriate treatment
- Guidance for policies on diagnosis and strategies

### **Topic 4: Compilation and management of data, including establishing biobanks for cancer standards**

#### *Description of the topic:*



Improve data collections in Africa including cancer registration, management and assessment of usefulness, ethical issues and also international standards. Creation of biobanks which will help with technology and knowledge transfer.

*Tools:*

Coordination and support action

*Expected impacts:*

- Better advocacy for resources for a response which is commensurate with the disease burden
- Improving healthcare planning and supply to promote equity
- Evaluation of the magnitude and the distribution of different cancers
- Contribution to global effort for cancer registration
- Monitoring impacts of intervention
- Promoting the discussion/debate on ethical issues

**Topic 5: Prevention strategies**

*Description of the topic:*

Policy research should be conducted to inform decision makers when choosing among prevention strategies, e.g. disseminating information about, education, diet and lifestyle issues. This includes studies of ethical and legal issues, protection of workers, mines, issues of plantations in Africa. Prevention strategies might target HPV vaccines, HBV vaccines, tobacco use, and alcohol abuse among others.

*Tools:*

Collaborative projects (several projects)

*Expected impacts:*

- Encourage national intervention strategies and implementation
- Promote social and political research at universities and other research institutions: capacity building
- Strengthen evidence base to support prioritization of implementation of intervention strategies
- Reduce the disease burden

**3.3 Cardiovascular disease (CVD)**

**Topic 1: Distribution of CVD risk factors**

*Description of the topic:*

Studies explaining variations in prevalence of CVD through exploration and distribution of risk factors: environmental, socioeconomic, cultural, metabolic, gender, demography, birth weight, migration, genomics among others.

*Tools:*

Collaborative projects (several projects)

*Expected impacts:*

- Strengthen the basis to develop interventions
- Improve the way to prevent and to care for CVDs
- Policy guidance (health care, organization of health services, prioritization of research themes.)
- Redefining regional specific cut-off points for CV factors
- Encourage realisation from population to enhance their environment
- Understanding of disparities in CVD risk among different peoples, including African migrants in Europe
- Understanding of CVD risk distribution in relation to genetic diversity in Africa

**Topic 2: Database for CVDs in Africa**

*Description of the topic:*

Establishing databases and improving medical records via computer utilisation. There is scope to explore the concept of “e-health” as it may apply to enhancing communication. A comprehensive database for CVDs involves the compilation of diagnostic features and factors associated with disease evolution. A research database would include studies on distribution of CVDs among different population groups, and studies grouped by theme and methodology.

*Tools:*

Coordination and support action

*Expected impacts:*

- Improved interventions by having all the information within a single database accessible by medical personal
- Public information made accessible by reader friendly publications

**Topic 3: General approach to links between cost, access and efficiency of healthcare delivery**

*Description of the topic:*

The approach is to adapt delivery of healthcare according to treatment access, costs, health systems and regional differences. The risk indicators aim to be adjusted for concerned populations, depending on technology possibilities to improve diagnostics. It will be necessary to give the means to do the compilation and organisation of registers containing a maximum of data on CVDs risks factors for each region. Targeting the possibility to understand differences of disease distribution for socio-economic interests. Developing studies about health economy to argue politically on a financial approach for improved access to healthcare depending on location.

*Tools:*

Collaborative projects (several projects)

*Expected impacts:*

- Improved understanding of CVDs
- A better comprehension will lead to a better adapted cure

**Topic 4: Classification of CVD types**

*Description of the topic:*

A review of the existing classification of different types of CVDs would be useful to identify the specificities related to the main causative factors, risk factors and appropriate treatments for each class in Africa. Compiling published data and adding new data could be facilitated via networks of information exchange.

*Tools:*

Collaborative projects (several projects)

*Expected impacts:*

- Improved knowledge of NCDs
- Prevention for health education
- Health policy and systems

**3.4 Chronic Non-Communicable Diseases**

**Topic 1: Integrated approaches to chronic NCDs**

*Description of the topic:*

The integrated strategy consists of a common health approach for good quality care, development of health systems and policies. In addition, it will need a common data collection on diagnosis, treatments and outcomes. It

aims to develop a common platform for epidemiology surveillance of NCDs and a model for integrated care.

*Tools:*

Coordinated action

*Expected impacts:*

- Support appropriate government ministries in decision making
- Improve capacities in social aspects of health
- Join international objectives to participation of social sciences in health
- Cost-efficiency versus benefits
- Unified delivery improves access for patients

### **3.5 Cross-thematic topic: NCDs and socioeconomic issues**

#### **Topic 1: Socio-economic interaction with CVD emergence**

*Description of the topic:*

Realisation of biological/sociological interactions through creating a network for establishing an inventory, showing African diversity issues, researching on risk factors at geographic and socio economic level. The emphasis has to be put on practices, diseases and medicine perception, socio-ethnographic studies and lifestyle. Possibility to add a comparison between African and European risk factors and perception.

*Tools:*

Coordinated action

*Expected impacts:*

- Best management of CVDs in different settings
- Definition of prevention strategies
- Best resources allocations focused on areas and population at risk

## CONCLUSION

Non-communicable diseases are “a priority, not a distraction” (Ebrahim and Smeeth, 2005). While malnutrition and famine remain the predominant concerns in rural areas, NCDs have emerged as a major health threat of middle-income countries and are increasingly important in urban areas in even in the poorest areas of the world. Moreover, while control of infectious diseases through environmental means assists the whole population, socio-economic differences in health behaviors such as smoking are creating new health inequalities. Although the European research framework programme prioritizes biomedical and clinical research, research for Africa should include broader social and cultural research for greatest impact. Policy responses to NCD disease research in Africa must engage national governments and international agencies as well as service providers and research communities. None can act effectively alone, and bringing together the different stakeholders was a valuable contribution of CAAST-Net.

The meeting noted biological and laboratory issues, clinical and epidemiological features, and also research on the organization of prevention and care, reflecting the broad backgrounds of the participating panel. The process did not seek to be exhaustive of knowledge and research initiatives on the topics, but rather to extend broadly and indicate topics for calls whereby more focused areas can be proposed. The issue was raised that there is a strong rationale for considering NCDs collectively as well as separately. Many of the NCDs considered share common risk factors and common interactions, e.g. between obesity, diabetes, hypertension and cardiovascular disease. The delivery of health service interventions for prevention and care, and the often multisectoral policies aimed at preventive measures, contribute to reduction of all of these diseases (WHO 2008). It is therefore necessary to consider not only research topics relevant to specific NCDs, but also research topics which represent a joint approach to the different NCDs together (Maher et al 2009).

Specific recommendations for research themes at the workshop were consolidated, developed into potential call texts, and distributed for further consultation before submission to the European Commission. The European research framework program has a multitude of inputs, and an annual cycle which iterates between external advice and internal program development. European member states have a strong influence through the program committees, although in the health field national research councils give more support to laboratory and biomedical topics than to public-health research (Conceicao et al 2008). Cooperation between European and African partners

is possible under the EU research framework program across a range of topics of mutual interest and benefit. Research on non-communicable diseases in Africa can contribute both to African development and also to better understanding of the diseases. The CAAST-net proposals will be among inputs to inform calls for joint European-African health research in the coming years.

Another impact of this workshop was the opportunity for European and African researchers for exchange of ideas and networking. One outcome of that networking opportunity was a paper published: McCarthy M, Maher D, Ly A, Ndip A. Developing the agenda for European Union collaboration on non-communicable diseases research in Sub-Saharan Africa. Health Research Policy and Systems 2010, 19 (8): 13(See annex 3).

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## **ANNEX 2: LIST OF FP7 CALLS OF THE COOPERATION WORK PROGRAMMES HEALTH**

### **FP7-HEALTH-2007-A**

#### **2.4. TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES**

##### **2.4.1. Cancer:**

2.4.1. HEALTH-2007-2.4.1-1: Translating the knowledge on noncoding RNAs linked to the aetiology of cancer into novel diagnosis and therapy strategies. Collaborative project (Small or medium-scale focused research project)

2.4.1. HEALTH-2007-2.4.1-2: Translating clinical 'omics'-technology (genomics, proteomics, metabolomics) into innovative cancer biomarkers aiding in early diagnosis, prognosis and treatment selection of cancer patients. Collaborative project (Small or medium-scale focused research project)

2.4.1. HEALTH-2007-2.4.1-3: Genomic instability and genomic alterations in pre-cancerous lesions and/or cancer. Collaborative project (Small or medium-scale focused research project)

2.4.1. HEALTH-2007-2.4.1-4: Novel cancer screening methods. Collaborative project (Small or medium-scale focused research project)

2.4.1. HEALTH-2007-2.4.1-5: Optimising research on end of life care of cancer patients. Coordination and support action (Coordination action)

2.4.1. HEALTH-2007-2.4.1-6: Understanding and fighting metastasis. Collaborative project (Small or medium-scale focused research project)

2.4.1. HEALTH-2007-2.4.1-7: Improving targeted drug delivery to cancer cells for cancer therapeutics other than gene therapy. Collaborative project (Small or medium-scale focused research project)

2.4.1. HEALTH-2007-2.4.1-8: Developing high-throughput bioassays and models for human cancers in lower species. Collaborative project (Small or medium-scale focused research project)

##### **2.4.2. Cardiovascular disease**

2.4.2. HEALTH-2007-2.4.2-1: Molecular basis of the inflammatory response and associated vascular remodelling in arteriosclerosis.

Collaborative project (Large scale integrating project)

2.4.2. HEALTH-2007-2.4.2-2: Vascular remodelling in aneurismal disease.

Collaborative project (Large scale integrating project)

2.4.2. HEALTH-2007-2.4.2-3: Combating stroke. Collaborative project (Largescale integrating project)

### **2.4.3. Diabetes and obesity**

2.4.3. HEALTH-2007-2.4.3-1: Early processes in the pathogenesis of type 1 diabetes and strategies for early prevention.

Collaborative project (Small or medium-scale focused research project)

2.4.3. HEALTH-2007-2.4.3-2: Combined forms of diabetes in children.

Collaborative project (Small or medium-scale focused research project)

2.4.3. HEALTH-2007-2.4.3-3: Insulin resistance as a key factor in the development of diabetes and metabolic syndrome.

Collaborative project (Small or medium-scale focused researchproject)

2.4.3. HEALTH-2007-2.4.3-4: Pathophysiological mechanisms related to excess fat.

Collaborative project (Small or medium-scale focused research project)

2.4.3. HEALTH-2007-2.4.3-5: A road-map for diabetes research.

Coordination and support action (Coordination or support action)

## **FP7-HEALTH-2007-B**

### **2.4. TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES**

#### **2.4.1. Cancer**

2.4.1. HEALTH-2007-2.4.1-9: Innovative combination clinical trials for multimodal cancer therapy.

Collaborative project (Large scale integrating project)

2.4.1. HEALTH-2007-2.4.1-10: Role of inflammation in tumour initiation and progression.

Collaborative project (Large scale integrating project)

2.4.1. HEALTH-2007-2.4.1-11: Epidemiology of gene-environment interactions involved in carcinogenesis.

Collaborative project (Large scale integrating project)

2.4.1. HEALTH-2007-2.4.1-12: Translating the hypoxic tumour microenvironment.

Collaborative project (Large scale integrating project)

2.4.1. HEALTH-2007-2.4.1-14: Studying cancer aetiology in Latin America.

SICA: Collaborative project (Small or medium-scale focused research project)

### **2.4.2. Cardiovascular disease**

2.4.2. HEALTH-2007-2.4.2-4: Congenital pathologies affecting the heart.

Collaborative project (Small or medium-scale focused research project)

2.4.2. HEALTH-2007-2.4.2-5: Cell therapies for the treatment of heart ischemia.

Collaborative project (Small or medium-scale focused research project)

2.4.2. HEALTH-2007-2.4.2-6: Organ imaging in CVD.

Collaborative project (Small or medium-scale focused research project)

2.4.2. HEALTH-2007-2.4.2-7: Integrating pharmacogenomic approaches into the treatment of CVD.

Collaborative project (Small or medium-scale focused research project)

### **2.4.3. Diabetes and obesity**

2.4.3. HEALTH-2007-2.4.3-6: Nutritional signals and the development of new diabetes/obesity therapeutic agents.

Collaborative project (Small or medium-scale focused research project targeted to SMEs)

2.4.3. HEALTH-2007-2.4.3-7: Markers and treatment for diabetic neuropathy complications.

Collaborative project (Small or medium-scale focused research project)

2.4.3. HEALTH-2007-2.4.3-8: Geno- and phenotypical differentiation of type 2 subjects and monogenic subjects.

Collaborative project (Small or medium-scale focused research project)

2.4.3. HEALTH-2007-2.4.3-9: Use of beta cell imaging in diabetes mellitus.  
Collaborative project (Small or medium-scale focused research project)

### **HEALTH-2009-Two-Stage**

#### **2.1.1 Large-scale data gathering**

HEALTH-2009-2.1.1-2: Large-scale functional genomics efforts to identify molecular determinants of cancer  
Collaborative project (Large-scale integrating project)

### **HEALTH-2010-two-stage**

## **2.4. TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES**

### **2.4.1. Cancer**

2.4.1. HEALTH.2010.2.4.1-5: Structuring clinical research on rare cancers in adults.

*Collaborative Project (Small or medium-scale focused research project). EC contribution per project: max EUR 6 000 000. One or more proposals can be selected.*

2.4.1. HEALTH.2010.2.4.1-6: Translational research on cancers with poor prognosis.

*Collaborative Project (Small or medium-scale focused research project). EC contribution per project: max. EUR 3 000 000. One or more proposals can be selected.*

2.4.1. HEALTH.2010.2.4.1-7: Predicting long-term side effects to cancer therapy.

*Collaborative Project (Small or medium-scale focused research project). EC contribution per project: max. EUR 6 000 000. One or more proposals can be selected.*

2.4.1. HEALTH.2010.2.4.1-8: Predicting individual response and resistance to cancer therapy.

*Collaborative Project (Small or medium-scale focused research project). EC contribution per project: max. EUR 6 000 000. One or more proposals can be selected.*

2.4.1. HEALTH.2010.2.4.1-9. Optimising the delivery of (chemo)radiotherapy and/or surgery to cancer patients.

*Collaborative Project (Small or medium-scale focused research project). EC contribution per project: max. EUR 6 000 000. One or more proposals can be selected.*

## **HEALTH-2010-single-stage**

### **2.4. TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES**

#### **2.4.1. Cancer**

2.4.1. HEALTH.2010.2.4.1-2: Structuring translational cancer research between cancer research centres in Europe. *Network of Excellence. EC contribution per project: max. EUR 12 000 000. Only up to one proposal can be selected.*

2.4.1. HEALTH.2010.2.4.1-3: Structuring clinical research in paediatric and adolescent oncology in Europe.  
*Network of Excellence. EC contribution per project: max. EUR 12 000 000. Only up to one proposal can be selected.*

#### **2.4.2. Cardiovascular diseases**

2.4.2. HEALTH.2010.2.4.2-2: New approaches to reduce ischemic damage to the heart.  
*Collaborative Project (Small or medium-scale focused research project). EC contribution per project: max. EUR 6 000 000. Only up to one proposal can be selected.*

2.4.2. HEALTH.2010.2.4.2-3: Identifying new therapeutic targets in atrial fibrillation.  
*Collaborative Project (Large scale integrating project). EC contribution per project: min. EUR 6 000 000 – max. EUR 12 000 000. Only up to one proposal can be selected.*

2.4.2. HEALTH.2010.2.4.2-4: Diastolic heart failure.  
*Collaborative Project (Large scale integrating project). EC contribution per project: min. EUR 6 000 000 – max. EUR 12 000 000. Only up to one proposal can be selected.*

### **Call for Africa**

Activity 1.2 Translating research for human health

HEALTH.2010.2.4.1-4: Infectious agents and cancer in Africa

*Collaborative Project (small or medium-scale focused research project) for specific cooperation actions (SICA) dedicated to international collaboration partner countries EC contribution per project: max. EUR 3 000 000. One or more proposals can be selected*

## **HEALTH 2011: TWO-STAGE**

### **2.4. TRANSLATIONAL RESEARCH IN OTHER MAJOR DISEASES**

#### **2.4.1. Cancer**

2.4.1 HEALTH.2011.2.4.1-1: Investigator driven treatment trials<sup>7</sup> for rare cancers.

*Collaborative Project (small or medium-scale focused research project). Requested EU contribution per project: Maximum EUR 6 000 000. One or more proposals can be selected.*

2.4.1 HEALTH.2011.2.4.1-2: Translational research on cancers with poor prognosis.

*Collaborative Project (small or medium-scale focused research project). Requested EU contribution per project: Maximum EUR 3 000 000. One or more proposals can be selected.*

#### **2.4.2. Cardiovascular diseases**

2.4.2 HEALTH.2011.2.4.2-1: Investigator driven clinical trials for the management of cardiovascular diseases.

*Collaborative Project (large-scale integrating project). Requested EU contribution per project: Maximum EUR 12 000 000. One or more proposals can be selected.*

2.4.2 HEALTH.2011.2.4.2-2: Evaluation and validation studies of clinically useful biomarkers in prevention and management of cardiovascular diseases.

*SME-targeted Collaborative Project (small or medium-scale focused research project).*

*Requested EU contribution per project: Maximum EUR 6 000 000. One or more proposals can be selected. Additional eligibility criterion: Projects will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 30-50% or more of the total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded*



### **2.4.3. Diabetes and obesity**

2.4.3 HEALTH.2011.2.4.3-1: Investigator driven clinical trials to reduce diabetes complications.

*Collaborative Project (small or medium-scale focused research project). Requested EU contribution per project: Maximum EUR 6 000 000. One or more proposals can be selected.*

2.4.3 HEALTH.2011.2.4.3-2: Development of novel treatment strategies based on

knowledge of cellular dysfunction. *Collaborative Project (small or medium-scale focused research project). Requested EU contribution per project: Maximum EUR 6 000 000. One or more proposals can be selected.*

2.4.3 HEALTH.2011.2.4.3-3: Molecular and physiological effects of lifestyle factors on diabetes/obesity.

*Collaborative Project (small or medium-scale focused research project). Requested EU contribution per project: Maximum EUR 6 000 000. One or more proposals can be selected.*

2.4.3 HEALTH.2011.2.4.3-4: Genetic and environmental factors in obesity and/or diabetes in specific populations.

*Specific International Cooperation Action (SICA), Collaborative Project (small or medium-scale focused research project) target regions: Mediterranean countries, Africa, Asia Latin-America). Requested EU contribution per project: Maximum EUR 3 000 000. One or more proposals can be selected.*

## **HEALTH 2011: SINGLE-STAGE**

### **2.4.1. Cancer**

2.4.1 HEALTH.2011.2.4.1-3: Epidemiology and aetiology of infection-related cancers.

*Collaborative Project (small or medium scale focused research project). Requested EU contribution per project: Maximum EUR 3 000 000. One or more proposals can be selected.*

## **ERA-NET Call 2011**

### **1.2.4 Translational research in other major diseases**

HEALTH.2011.2.4.3-5 ERA-NET on diabetes prevention and treatment

## **ANNEX 3: HEALTH RESEARCH FOR NON-COMMUNICABLE DISEASES IN SUB-SAHARAN AFRICA**

McCarthy M, Maher D, Ly A, Ndip A. Developing the agenda for European Union collaboration on non-communicable diseases research in Sub-Saharan Africa. *Health Research Policy and Systems* 2010, 19 (8): 13

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## **Abstract**

**Background.** A workshop on priorities for European-African collaboration in research non-communicable diseases research was held in Yaoundé, Cameroon, organized by the Network for the Coordination and Advancement of Sub-Saharan Africa–European Union Science and Technology Cooperation (CAAST-Net).

**Methods.** Participants from academic, clinical, public-health and administrative positions considered research for cardiovascular disease, cancer and diabetes, and integrated care for non-communicable diseases.

**Results.** Suggested research fields include better methods for description and recording, clinical studies, understanding cultural impacts, prevention strategies and organisation of care.

**Conclusions.** The results will contribute to preparation of future European Union research programmes.

## Introduction

The Yaoundé workshop on research on non-communicable diseases (NCDs) was held in Yaoundé, Cameroon, 4-5 November 2009, and organized by the Network for the Coordination and Advancement of Sub-Saharan Africa–European Union Science and Technology Cooperation (CAAST-Net) and hosted by the Institut de Recherche pour le Développement (IRD).

### *Developing research cooperation*

CAAST-Net was established through FP7 to explore mutual interests and to advance cooperation across research fields relevant to Africa. The four-year project, which started in 2008, supports Africa-Europe dialogue in research across the broad field of policy areas, including identification of specific research topics for Research FP7 <sup>1</sup> (CAAST-Net 2009). It forms one of a group of projects related to science in Africa supported by the EU<sup>3</sup> and is led by the Association of Commonwealth Universities on behalf of the International Science and Innovation Unit of the UK government. CAAST-Net maps African research issues of mutual interest for Europe, seeks a consensual approach from participants, and addresses broad themes for subsequent elaboration. The three main criteria to prioritise choices are: 1) enabling conditions (that capacity has to exist); 2) strategic imperatives (international policy support, for example in NEPAD); and 3) mutual benefit for Europe and Africa. In May 2009, the first panel considered research on energy, while later seminars address urban transport and social sciences research. Outputs from each seminar are specific researchable topics, while the broader outcome is strategic research cooperation between the two continents.

### *Health research in Africa*

Developments over the past decade have raised the profile of health research in Africa. The Abuja Declaration and Plan of Action from the African Summit on Roll Back Malaria in 2000 catalysed concern for both interventions and research for health. The New Partnership for Africa's Development NEPAD (2009), created in 2001 under the auspices of the Organisation of African Unity, recognises the contribution of health in

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<sup>3</sup> These include: ST-EAP (Science and Technology – Europe Africa Project; INT-ER-LINK (Promoting International Cooperation for Environmental Research Through Dissemination and Networking Activities); PAEPARD (Building Up A Platform for African-European Partnership on Agricultural Research for Development); MIRA (Mediterranean Innovation and Research Coordination Action); CPN-YAS-PRD (Contact Point Network to Attract Young African Scientists to Participate in EU-funded Poverty-Related Disease Research Projects); INCONTACT (Network of the INCO-NCPs).

supporting economic development in Africa. The Joint Africa-EU-Africa Strategy, adopted at the Lisbon EU-Africa Summit in 2007, comprises eight thematic partnerships, including one for Science, Information Society and Space. The Global Ministerial Forum on Research for Health in Bamako, Mali in 2008 affirmed the importance for Africa of health research.

#### *Non-communicable diseases in Africa*

The epidemiological transition and resulting rise in non-communicable diseases gives prominence to non-communicable diseases (including cardiovascular disease - heart disease and stroke - diabetes and some cancers), which together now account worldwide for up to 60% of deaths, and almost half of all 'premature' deaths (Daar et al 2007). WHO predicts that NCD deaths globally will increase by 17% over the next decade, with the greatest increase in the African region (27%) (WHO 2008). Yet in sub-Saharan Africa, governments, donors and research-funders have channelled most resources into infectious diseases, especially the trio of HIV, malaria and tuberculosis; and initiatives such as the European and Developing Countries Clinical Trials Partnership (EDCTP) have been focused on treatment and healthcare services for these infections rather than the needs and opportunities for prevention through public policy and changing lifestyles.

Recent favourable developments for NCDs, however, include the WHO Global Strategy for the Prevention and Control of Noncommunicable Diseases (WHO 2008) and the establishment by WHO, the World Bank, the World Economic Forum, and three international NGOs (the World Heart Federation, International Diabetes Federation and the International Union against Cancer), of a global NCDs network (NCDnet) to spread initiatives on NCDs. The network will join health-care and preventive approaches, and also enable research on interventions at primary care level (Maher 2009).

#### *European Union health research programme*

The European Union Seventh Research Framework Programme runs from 2007 to 2013. It has four broad sub-programmes: Cooperation (thematic research); Ideas (researcher-driven proposals); Capacities (supporting structures); and Marie Curie (supporting individuals). Health is the second best-resourced of the thematic calls within the Capacities programme, distributing over half a billion Euros a year. Calls for research are made annually. As well as researchers within the EU, and the 'associated states' which also contribute financially to the programme, research collaboration is encouraged with countries across the world. Some parts of the call are focused on international cooperation with specific geographical regions and countries. For the first time in 2009, topics for cooperation with Africa in

three thematic areas – health, food and environment – were launched as a coordinated joint call.

#### *Determining NCD research priorities*

There is a limited literature on non-communicable disease research priorities in developing countries. Unwin et al (2001) reported conclusions of 'discussions over several years' between clinicians in UK and two African countries. They recommended clinical research in three broad areas – surveillance, treatment and prevention – without a basic sciences biomedical approach. Daar et al (2007) drew on views from experts and representatives from international organisations and research agencies. Publishing in *Nature*, they proposed 39 topics for research across six broad socio-political areas: raising public awareness, enhancing policies, modifying risk factors, engaging business and communities, mitigating impacts of poverty and urbanisation, and reorienting health systems. Ebrahim and Smeeth (2005) summarised existing literature on NCDs relevant to low and middle-income countries, but also recommended that research within individual countries, rather than simply drawing from world scientific literature, is crucial to changing government agendas and policies.

#### **Methods**

The consultation on research on NCDs brought together experts for a two-day meeting in Yaoundé, Cameroon, during 4-5 November 2009. Prior to the consultation, experts and stakeholders were asked to submit short abstracts on potential research issues, and 17 of these were received and considered within the consultation. The objective of the meeting was to recommend broad areas for research for the three NCDs (cardiovascular disease, cancer and diabetes) identified as having particular relevance for Africa-Europe collaboration, and for integrated approaches to these NCDs. The process of consultation in the workshop did not seek to be exhaustive of knowledge and research initiatives on the topics. Consideration of the specific proposals submitted in advance served to initiate discussion, resulting in the identification of broad topics to be considered and further elaborated for inclusion under the health theme in future FP7 calls. This report records the evidence and discussions of the group over the two days.

#### **Results**

##### *Cardiovascular disease*

African aspects of cardiovascular diseases were considered to include the wide population distribution of hypertension, and impacts including nephropathies and cardiomyopathies. Preliminary data indicate that the burden of cardiovascular disease in Africa is growing, and contributing conditions, such as diabetes and obesity, are also increasing rapidly. There is an urgent need for more comprehensive and representative data to define better this burden across Africa.

While known risk factors have an important place, there is no equivalent of the Framingham longitudinal study providing data about populations and factors of disease progression for Africa. Areas of further investigation could include salt sensitivity and arterial stiffness – which may have genetic components. Since malnutrition rather than dietary excess continues to be a pressing problem in rural Africa, low birthweight may be an important determinant of cardiovascular diseases in later age for people moving to towns and cities and taking up western lifestyles.

Cultural, ethnographic and geographical analyses are important, since there may be differences between western and African concepts of health and disease. Cultural attitudes towards obesity, for example, may have marked differences within and between continents, such that in some societies obesity may be seen as a sign of wealth and feature of beauty.

There is a lack of representative information within countries, and insufficient information on differences between countries. There is a need for the development of structures for gathering information, networks to share data and support analysis, and better use of information to provide health ministries with the evidence base for developing new approaches. At local level, systems developed for HIV treatment and monitoring could form the basis for the development of shared disease and treatment registries. These data, when linked to differences in cultures, are also of great interest to social scientists.

Areas of concern include how to organise the health system to provide an effective response to the challenges posed by cardiovascular disease, the evaluation of cost-effectiveness of different means of care delivery, and the provision of the related social support programmes needed. Developments need to be adapted to the population, including for example innovations in diagnostic tests, outreach support through tele-medicine and appropriate medicaments, with the value determined by cost-effectiveness studies.

The discussion indicated the research topics shown in Table 1.

## *Cancer*

While WHO's leadership has helped to increase attention to cancer worldwide, there has been significant progress in raising the profile of cancer in Africa, including the systematic description of what is currently known (Ly and Khyat, 2006). In addition to cancers which are common in both Europe and Africa, e.g. breast, colon, lung and prostate, there are significant impacts in Africa of cancers strongly associated with virus infection, e.g. cancer of cervix and Kaposi sarcoma.

CARISA (2008) reported the 'landscape' of cancer research of South Africa. Cancer research support includes data management, diagnostics (biomarkers, genomic profiling, imaging techniques), prevention, treatment, and palliation and social aspects. But their main areas proposed for research included molecular carcinogenesis, genetic and molecular epidemiology, and therapeutic development.

However, while there is much interest in the links between genetics and cancer, Africa has the most diverse gene pool in the world, limiting the feasibility of epidemiological studies. Moreover, as yet no-one has identified human protein markers, and proteomics is beyond the financial resources of most African countries.

There is an urgent need to improve diagnostic services, including the evaluation of diagnostic innovations such 'telepathology' (as there are very few pathologists in Africa) and to improve treatment services, including the provision of common anti-cancer drugs and morphine for palliation.

Cultural factors for investigation include the possible protective effects of diet against cancer (e.g. drinking Rooibos tea in South Africa) and plants (e.g. maize as a factor in the lower prevalence of colon cancer among black than among white South Africans).

Knowledge is needed to support ministries of health in developing evidence-based policies for the implementation of interventions which are widely available or are being widely introduced in Europe but are not yet available in Africa. For example, cost-benefit and health politics studies are needed on the impact of human papilloma virus vaccination and cervical cancer screening programmes on cervical cancer prevention. Public demand also needs consideration - what do people want?



The discussion indicated the research topics shown in Table 2.

### *Diabetes*

There are estimated to be 12 million people with diabetes in African, and the numbers growing by 1 million every two years. The increasing problem of diabetes in many European countries has accompanied increases in obesity. Most explanations for the rising prevalence of diabetes in sub-Saharan Africa emphasise lifestyle changes due to globalisation and urbanisation, with more affluent sections of society becoming more sedentary and overweight. More comprehensive and representative data in Africa are urgently needed. One participant reported that a study site in Cameroun showed a prevalence of type 1 diabetes of 0.6%, with a prevalence of impaired glucose tolerance ('near diabetes') of up to 6%.

A critical issue for epidemiological studies is in defining standards for diagnosis. Reference values from western countries may not necessarily be the same for Africa. For diabetes there is debate whether HbA1C is superior to fasting blood sugar and glucose tolerance test in Africa, because of cost and since HbA1C results may be confounded by the presence of haemoglobinopathies and G6PD deficiency. The suggestion that differentiation between type 1 and type 2 diabetes is less clear cut in Africa needs further study.

We need to understand the particular characteristics of people who develop diabetes which may indicate risk factors specific to Africa, such as unique genetic polymorphisms (expressed by different plasma proteins) and particular interactions with the environment. For example, in parts of Africa, such as around the great lakes, the soil contains much iron and there are clinical reports of unusual forms of diabetes in patients who are not obese and relatively young, which may be associated with pancreatic iron overload. Nutritional factors are important, including the 'double burden of malnutrition' (the interaction between malnutrition in maternal and early infancy periods and later dietary excess).

Good diabetes control and management can decrease the risk of tissue damage. Research is needed on improving the primary care response to the needs of people with diabetes, including cost-effective ways of recognising organ damage and improving clinical management. There are examples of a few preventive and care programmes, e.g. in certain sites in Nigeria and the Democratic Republic of the Congo, but these are in the private healthcare sector. Half a million people worldwide have chronic diabetic kidney disease.

The numbers affected by renal disease in Africa and the financial implications for diagnosis and treatment need to be further explored.

The discussion indicated the research topics shown in Table 3.

#### *Integrated approaches to NCDs*

In addition to the research topics identified for each specific NCD, research is also relevant to the NCDs collectively, since they share common risk factors, interactions, and similarities in approaches to prevention and care.

Common risk factors such as obesity, diabetes, and hypertension contribute to cardiovascular disease, and to the complications of cardiovascular disease. The delivery of health service interventions for prevention and care, and the often multisectoral policies aimed at preventive measures, contribute to reduction of all of these diseases.. Since important social and cultural perspectives may be relevant across different NCDs, studies of prevention and clinical management should address NCDs as a group. This can be more efficient, avoiding duplication of effort: for example, developing a standard approach to registration and follow-up of patients, and developing policies for prevention based on shared risk factors.

The discussion indicated the research topics shown in Table 4.

#### **Discussion**

Non-communicable diseases are 'a priority, not a distraction'. (Ebrahim and Smeeth, 2005) While malnutrition and famine remain the predominant concerns in rural areas, NCDs have emerged as a major health threat of middle-income countries and are increasingly important in urban areas in even in the poorest areas of the world. Moreover, while control of infectious diseases through environmental means assists the whole population, socio-economic differences in health behaviours such as smoking are creating new health inequalities. Although the European research framework programme prioritises biomedical and clinical research, research for Africa should include broader social and cultural research for greatest impact. Policy responses to NCD disease research in Africa must engage national governments and international agencies as well as service providers and research communities. None can act effectively alone, and bringing together the different stakeholders was a valuable contribution of CAAST-Net.

The meeting noted biological and laboratory issues, clinical and epidemiological features, and also research on the organisation of prevention and care, reflecting the broad backgrounds of the participating panel. The process did not seek to be exhaustive of knowledge and research initiatives on the topics, but rather to extend broadly and indicate topics for calls whereby more focused areas can be proposed. The issue was raised that there is a strong rationale for considering NCDs collectively as well as separately. Many of the NCDs considered share common risk factors and common interactions, e.g. between obesity, diabetes, hypertension and cardiovascular disease. The delivery of health service interventions for prevention and care, and the often multisectoral policies aimed at preventive measures, contribute to reduction of all of these diseases (WHO 2008). It is therefore necessary to consider not only research topics relevant to specific NCDs, but also research topics which represent a joint approach to the different NCDs together (Maher et al 2009).

Specific recommendations for research themes at the workshop were consolidated, developed into potential call texts, and distributed for further consultation before submission to the European Commission. The European research framework programme has a multitude of inputs, and an annual cycle which iterates between external advice and internal programme development. European member states have a strong influence through the programme committees, although in the health field national research councils give more support to laboratory and biomedical topics than to public-health research (Conceicao et al 2008). Cooperation between European and African partners is possible under the EU research framework programme across a range of topics of mutual interest and benefit. Research on non-communicable diseases in Africa can contribute both to African development and also to better understanding of the diseases. The CAAST-net proposals will be among inputs to inform calls for joint European-African health research in the coming years.

### **Competing interests**

The authors declare that they have no competing interests

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**Table 1. Topics emerging for cardiovascular disease research in Africa**

Studies assessing effectiveness of prevention, e.g. promoting health and changing lifestyles.

Studies explaining variations in disease incidence – assessing the role of risk factors (e.g. low birthweight), genomics, and cultural aspects

Studies aimed at improving data on incidence and outcomes of care

Developing networks for data collection, sharing and analysis

Studies of competing cultures in response to treatment

Comparing disease risk and occurrence in Africans in Africa and Africans who are migrants to Europe

Studies of ways of improving diagnosis, including ways of providing advice at a distance

**Table 2. Issues emerging for cancer research in Africa**

Studies of aetiology, e.g. epidemiological investigation of variations in incidence of common cancers, differences of environment, viruses, lifestyle (including diets), and genetic markers

Studies on the effective organisation of services, including improved diagnosis (e.g. telepathology for identification of lymphoma) and treatment (e.g. cost-effectiveness and equity of access in provision of chemotherapy and radiotherapy), and palliative care (e.g. pain control).

Occupational cancers – studies of ethical and legal issues, protection of workers, mines, issues of plantations

Scoping study of emerging diagnostics, including proteomics

Studies of better data collection, including cancer registration, management and assessment of impact

Effectiveness and cost-effectiveness of prevention strategies: vaccines, tobacco, diet, alcohol, information and education for lifestyle change. Policy research to inform decision-makers choosing different prevention strategies.

Psychological and cultural approaches to cancer as a disease, and towards dying

Evidence for policy-makers to decide between different models of cancer, including assessment of equity of access and outcome

**Table 3. Topics emerging for diabetes research in Africa**

Coordinated studies of prevalence and trends of diabetes in different settings

Studies to evaluate implementation of a structured approach to diagnosis and treatment, with improved data collection on diagnosis and treatment outcomes to inform better service delivery.

Studies on improving access to diagnosis and care, with care delivery closer to the patient, e.g. in community settings and through enhanced role of non-medical staff.

Assessment of effectiveness of early detection of end-organ damage (for burden of disease and service planning, e.g. footcare problems)

Studies of dietary transition from rural malnutrition to different diets in urban settings, the role of maternal malnutrition, extent and mechanisms of insulin-resistance, and barriers and resilience of communities for prevention.

Biotechnical approaches to aetiology - genetics, resistance, blood markers, animal models.

Urbanisation - environments affecting human behaviours – causing diabetes and the potential for alternative urban settings

Studies on provision of affordable diagnosis, case-detection and screening

**Table 4. Topics emerging for integrated research on NCDs in Africa**

Measurement of prevalence and trends over time of common shared risk factors of NCDs in different settings in Africa, e.g. urban, semi-urban and rural.

Studies of management of NCDs in primary care settings, including records systems, diagnosis and management protocols, and drug procurement.

Studies on policies and practice for lifestyle changes to meet shared risk factors in NCDs, including physical activity, smoking, improved diet and decreased alcohol intake.

Studies on health systems and quality of care delivery, e.g. human resources, financing, procurement of drugs and supplies, and organisation of health facilities.