

Submission by South Africa

New and Innovative sources of funding to stimulate R&D

It is acknowledged that the major funders of Health related R&D can be classified as follows:

- Governmental funds specifically earmarked for R&D: The funds are made available through either call for research proposals, or via donor funds earmarked for specific interventions.

It is also acknowledged that in most developing countries the majority of these funds come from developed countries, e.g. the FP7 programme of the European Union and the research grants from the NIH. Although governments of some emerging countries are also providing some R&D funds, these are mostly earmarked for research projects within that specific country, e.g. Brazil and India.

- The Private sector also provides Health R&D funds, but these funds are mostly utilised for very specific research questions that benefit the endeavours of the specific companies. The Multinational Pharmaceutical companies are good examples in this regard.
- Philanthropic organisations, such as foundations and trusts, are also major contributors to Health R&D, especially in Type II and III diseases.

However, it is also acknowledged that in general the countries in the South, especially those most affected by Type II and III diseases, will not be able to contribute much to the funding of Health R&D. There are rare exceptions to this state of affairs and those countries that are able to muster funds should be acknowledged.

It is suggested that governments from emerging and lesser developed countries should be encouraged to find ways of raising additional funds that will be specifically earmarked for Health R&D. The possibility of raising additional taxes on transport, cigarettes, alcohol and tourism should be investigated. Where National Lotteries exist, the government should also be encouraged to allocate a specific portion of the profits towards health research. It is also suggested that tax incentives should be put into place to encourage the private sector to make a certain proportion of their profits available for health R&D. Especially those companies that are benefiting from tenders awarded within the public health sector should be encouraged to donate funds into a Health research fund that will benefit the country that awarded the tender.

It is essential to ensure that any funds that are raised for Health R&D within developed and emerging countries should be ploughed back into those countries and not be distributed internationally. It is therefore suggested that in the case of Africa a regional health R&D coordination office should be created. The intention will be to provide sustainable mechanisms that are geared to providing specific solutions building on the capabilities and opportunities available in Africa.

The function of such an office should be to:

- Foster research and build capacity for research for neglected and extremely neglected diseases. It is necessary to devise structures that can enable African scientists to develop and become the Principal investigators in some of the R&D projects. R&D projects should also include basic science projects.
- Set up the facilitating mechanism, that will be able to receive and distribute funds for Health R&D in Africa.

- Focus on priority challenges. These can be determined on a three year cycle, e.g. starting with diarrhoea, tuberculosis and vascular diseases. These priorities can be determined through a specific prioritising process that will involve all the countries that participate in Health R&D coordination for Africa. Various methodologies to attain this are available. Organisations such as COHRED can assist in the process.
- Galvanise a range of sources of funding, e.g. governments, philanthropic organisations and the private sector. It will also be important to ensure that funds generated within a specific country are utilised in that country.
- Assist with the development of a comprehensive Health R&D innovation programme in Africa, that also address IP and indigenous knowledge issues.

This Health R&D Coordination office should also be linked to the activities of African Ministers Committee on Science and Technology (AMCOST). The AMCOST will then decide where this Health R&D Coordinating office will be hosted. This will also be in line with the efforts to ensure that Ministries of Health and Ministries of Science and Technology are working closer, as per the Bamako initiative.

South African Health Innovation as an example

A good example in this regards is the activities of the South African government. The National Research and Development Strategy (NRDS) (2002)ⁱ in South Africa was adopted by Parliament as a strategy geared toward the establishment of the necessary enabling environment. The NRDS recognises the complex interplay and the synergies that can be created through co-ordination between sector specific research systems and the National System of Innovation that includes the universities, the various national science councils, government and the private sectorⁱⁱ.

The NRDS sees the Department of Science and Technology (DST) playing a strong role with regard to health research and health technology in South Africa. Health-related research should soften the devastation caused by diseases.

The NRDS recognises that the following issues, although not exhaustive, should form the core of the health research effort.

- Understanding the social impact of diseases.
- Creating an environment and technologies to reduce the effect of poverty on the spread of diseases.
- Developing care and support strategies.
- Understanding the challenges in providing access to prevention and care measures.
- Developing innovative preventative strategies.
- Developing novel therapeutic regimes, including the utilisation of indigenous knowledge.
- Developing preventive and therapeutic HIV/AIDS vaccines.
- Creating a viable vaccine manufacturing industry.
- Appropriate forms of telemedicine could assist in transforming rural health care provisionⁱⁱⁱ.

Taking cognisance of the international trends, the South African National Research and Development Strategy and also the health research priorities for South Africa, it is considered appropriate that the role of the DST in health research can be broadly defined as ***the promotion of the development and exploitation of new technologies and the advancement of basic knowledge of biology and human behaviour***. As a consequence, the DST is primarily involved with science interventions that relate to vaccine development,

issues of drug discovery, the development of new diagnostics, as well as the development of medical devices and treatment regimes.

In order to ensure that the research is sustainable and is translated into appropriate social and economic benefit, the DST actively participates along the entire length of the Innovation Chain. For South Africa, this Innovation Chain encompasses capacity development, technology development, including basic science and frontier programmes, biotechnology, nanotechnology and technology transfer, including clinical trials, commercialisation of IP and implementation through pilot programmes.

The role played by the DST will be in conjunction with the other major players in health research such as national and provincial government departments of Health, the Health Research Committee (HRC), the Medical Research Council and various institutions that conduct health research and develop or improve health technologies. In order to facilitate this, a specific Health Innovation Unit was established within the Department of Science and Technology. The Science and Technology Interventions for Health Innovation can therefore be seen as interventions that have a long-term time frame, constituting a high risk and dependant on disruptive and innovative technologies.

The South African Science and Technology Interventions for Health Innovations will concentrate on the research and innovation that leads to discovery and evaluation of new drug and treatment regimes, the development of new vaccines and new robust diagnostics for the identified diseases or conditions, as well as the development of medical devices. The range of research activities will include the interrogation of indigenous knowledge, basic molecular science and genetics, chemistry and bio-chemistry, biotechnology, nanotechnology, nuclear physics, ICT, manufacturing processes and engineering.

New legislation designed to promote good practice and ensure that local intellectual capital is protected and exploited is bringing new changes to the R&D landscape. The National Environmental Management: Biodiversity Act, 2004 defines the conditions under which Bioprospecting and related research may be carried out. The fundamental principles of the Biodiversity Act are carried through into the Patent Amendment Act, 2005, which obliges patent applicants to furnish information relating to any role played by an indigenous biological resource, a genetic resource or traditional knowledge or use in an invention. The International Property Rights from Publicly Financed Research and Development Act, 2008 sets out to provide procedures and guidelines for managing intellectual property derived from South African R&D. All these initiatives have strengthened South Africa's intellectual property regime with the intention of encouraging holders of technology to transfer their technologies given that there are stronger guarantees against the unauthorised and uncompensated use of technologies.

The priority for national research efforts is how to best leverage the existing intellectual capacity and infrastructure as well as strategic partnerships. Research institutions with higher levels of expertise are encouraged to partner with institutions with limited capacity in order to build research capacity at these institutions. Specific Health R&D and Innovation priority areas were identified based on the burden of disease and the deliberations of the Essential National Health Research Committee of the National Department of Health as well as the National Research and Technology Foresight exercise. These Health R&D priorities includes HIV/AIDS, Tuberculosis, Malaria, Cancer, Diabetes, Mental Health, Vascular Diseases, Respiratory infections and Diarrhoea.

The Department of Science and Technology is addressing these priority areas through different initiatives. The most direct intervention is the establishment of Centres of Competence that aims to develop specific medical products and services. A full value chain approach is followed, starting from the research competencies and knowledge on a specific

disease, normally based at a university, to applied research and actual steps necessary for product development and evaluation. Consortia of researchers are encouraged to develop a specific research strategy per priority area. These consortia will have to be representative of most of the researchers / research institutions in South Africa that are dealing with that specific disease or technology area. Participation of the private sector is also encouraged and invited, especially biotechnology companies that were developed through the activities of the Biotechnology Innovation Centres, an initiative of the Department of Science and Technology. Research institutions with higher levels of expertise will be encouraged to partner with institutions with limited capacity in order to build research capacity at these institutions. Examples are the Malaria and Tuberculosis Centres of Competence. Where actual product development might be further down the line and it is still essential to search for basic scientific answers, Research and Innovation Platforms are developed, e.g. SHARP (SA HIV/AIDS Research and Innovation Platform). These Research and Innovation Platforms and Centres of Competence will be based at the Technology Innovation Agency (TIA).

In addition to this, the DST through the National Research Foundation (NRF) is funding a number of Centres of Excellence, where the emphasis is more on basic discovery research. The Centre of Excellence for Biomedical Tuberculosis Research, based at WITS and Stellenbosch University, and the South African Centre of Excellence in Epidemiological Mapping and Analysis (SACEMA) are the two human health related Centres of Excellence. The South African Research Chair Initiative, based at the NRF, also provides opportunities to further human health related research activities in South Africa. More than 25% of all allocated research chairs have a direct bearing on Human Health Research. The aim of the research chairs is to strengthen the research capacity at the South African Universities, by assisting academics to concentrate on research activities and the training of researchers. Skills are also bought in where necessary.

i South Africa: 2002. National Research and Development Strategy. Department of Arts, Culture, Science and Technology.

ii South Africa: 2002. National Research and Development Strategy. Department of Arts, Culture, Science and Technology. p17

iii South Africa: 2002. National Research and Development Strategy. Department of Arts, Culture, Science and Technology. p 43.