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KEY FINDINGS AND RECOMMENDATIONS

Based on the findings from this study, the panel offers the following recommendations. Where possible, care has been taken to identify specific institutions or agencies that should take responsibility for implementing the recommendations; however, this is not always possible or applicable. It is our overall recommendation that these conclusions and recommendations be considered and discussed at a Southern African Development Community (SADC) regional symposium on biosafety and biosecurity where they can be refined and additions can be made.

6.1 Improving the capacity to detect and respond to infectious disease outbreaks

1. At the outset of this study, no comprehensive database of public and commercial research and diagnostic facilities existed in South Africa. One of the outputs of this study is a database that is a resource of laboratories for DoH, DAFF and DST. It can be a determination of national research and diagnostic capacity, and an assessment of gaps in the particular areas, particularly in relation to diagnostic capacity.

The panel recommends that the database compiled during this survey be considered a national asset and that its ongoing development and maintenance (including the development of a GIS map of all facilities) becomes the responsibility of the DST.

In the view of the panel, the DST is correctly placed to take on this responsibility since it straddles the fields of human, animal and plant health. In the interim, the database is available from ASSAf on request, but not for commercial use. The development of a GIS map of facilities, together with additional information overlays, so as to be able to, for example visually represent the ratio of diagnostic laboratories per area or region, and even to the burden of disease, is recommended. Such information may be valuable when determining the location for new laboratory services. In addition, information about the location and capacity of laboratories is necessary if any monitoring or inspection is to take place to ensure adherence with legislation.

2. This study identified that multiple South African laws and regulations govern the prevention, detection, identification and control of disease due to infectious agents. Five different government departments are responsible for the regulations which ensure public safety with respect to infectious diseases. No single, regularly updated and publicly accessible list of agents based on the South African epidemiological risk profile of each agent currently exists.

The panel recommends that DoH, DAFF and DST, along with other relevant agencies, collectively determine whether such a comprehensive list would be a helpful tool for policymakers to cross-reference during the development of regulations; and if so, to undertake the development and maintenance of such a list.

3. Within human health, the study found poor compliance with the statutory obligation to notify Notifiable Medical Conditions. Reasons postulated included health professionals' lack of awareness regarding notification, the complexity of the GW 17/5 notification form and the rapid turnover of staff involved in managing outbreaks at a provincial level.

It is recommended that DoH ensure that health-care professionals are made aware of the statutory requirement to notify and improve the current system to ensure a seamless system for the accurate reporting of notifiable conditions. This could be done by providing training/workshops to discuss how to report notifiable conditions or by providing access to training materials or information.

6.2 Education and awareness raising

1. The survey of practising life scientists (reported on in Chapter 5) found that education and/or training on research ethics, including issues such as scientific misconduct (falsification, fabrication and plagiarism) is not routine for life scientists. Such training is essential to ensure the integrity of science in South Africa.

It is recommended that the NRF and the Department of Higher Education and Training consider means to ensure the inclusion of research ethics training in the training of all life scientists in South Africa.

2. With respect to biosafety and biosecurity training measures, it was found that biosafety training is not routine for staff working in laboratories, nor was a test of competence routinely required.

The panel recommends that the DoH consider drafting regulations to require that relevant laboratory staff undergo biosafety training that includes an assessment of competence.

Laboratory safety manuals, signed-for by all scientific and technical personnel, should be an obligatory requirement of all life science laboratories.

3. It was found that there is a low level of awareness among life scientists about national and international conventions, laws and regulations related to their research; and that information about these instruments is not readily available.

It is recommended that the Council for the Non-Proliferation of Weapons of Mass Destruction develop and disseminate (digitally and in print) details of the relevant national and international laws to all research and diagnostic facilities and all educational facilities in South Africa. This can also include an online guideline to relevant regulations on biosafety and biosecurity.

4. It was found that the terms biosafety, biosecurity and dual-use are neither commonly understood, nor is there consensus on the meaning or use of the term 'biosecurity'.

It is recommended that the NRF require researchers to demonstrate familiarity with these terms when submitting applications for research that could be considered 'dual-use'.

5. The study found that assessments of the biosafety and biosecurity risk associated with research activities are not routinely conducted, including assistance in identifying the level of containment required for the organisms being studied.

It is recommended that institutional research ethics committees require evidence of such an assessment having taken place before ethical approval is granted for research, including research not involving human and animal subjects.

6. Given the need to develop a strong national capacity to undertake life science research, it is important to ensure that junior research staff are supported and encouraged and that senior staff with experience are retained. The survey finding that fewer than half of all junior research staff feel consistently supported and nurtured suggests that at institutional and national levels, attention needs to be paid to develop the capacity of senior staff to mentor junior staff.

Perhaps even more concerning is the perception that senior staff are not valued, nor are efforts made to retain their skills. More than half of the respondents in this survey felt that senior staff are not consistently valued by their institutions, indicating an imperative to incentivise and encourage staff to remain in the life sciences.

The panel recommends that universities and research institutions take note of this finding and seek to put in place measures to mentor junior staff.

6.3 Ethics review

1. In South Africa, no ethical guidelines specifically formulated for life sciences that do not entail research on humans or animals have been formulated or published. The Research Guidelines of the NHREC are currently (2014) being revised. The guidelines in Chapter 2 of the revised Research Guidelines are of general relevance to life sciences research on non-human subjects, but they need to be supplemented with more specific guidelines for the latter branch of science.

The panel recommends that the NHREC take the findings of this study into consideration in the process of revising the research guidelines. It is also recommended that the funding agencies (such as NRF, MRC) take ownership of addressing the more general research guidelines for all life science research.

2. While a code of conduct itself may not prevent undesirable behaviour or actions, the process of developing such a code may have the effect of raising awareness and encouraging reflection. However, this should not be seen as a substitute for more substantial training that should include reference to the relevant national and international laws, regulations and conventions.

We propose that every research institution undertaking life science research consider developing and applying a code of conduct (COC) for researchers. We recommend that the training of life scientists should include a comprehensive ethics component and reference to all relevant national and international laws, regulations and conventions.

6.4 Scientific openness and transparency

While openness and transparency are regarded as important for scientific progress, there are a number of legitimate reasons why researchers may not be able to be entirely open about their research or findings. Reasons may range from the need to protect IP to the need to protect the identity of research participants.

While these constraints on openness may be legitimate and even necessary, the norm should be towards openness and sharing of information, as openness and knowledge-sharing serve the interests of scientific progress.

1. The results of the survey indicate that research scientists in South Africa are supported and encouraged to collaborate less often with researchers from other institutions than they are with colleagues from their own institutions. Since most respondents were from research institutions receiving public funds, the finding that only slightly more than half of the respondents felt that collaboration with colleagues outside of their institution was routinely facilitated or encouraged suggests that such collaboration is not considered a priority and support for such collaboration could be increased.

The panel recommends that the NRF actively encourages inter-institutional collaboration through establishing incentives.

2. While financial accountability appears to be the norm in research facilities, and would be demanded by funders and academic institutions, openness about the sources of funding is not routine, or recognised by scientists, this being confirmed by the survey data accumulated here. There are several ways in which such openness could be encouraged at institutional level. This includes requiring staff who received grants to list these on their staff profiles, through the maintenance of an online open access list of projects and their donors. Alternatively, by encouraging funders themselves to require grant recipients to declare the source of their funds when publishing or presenting research results.

It is recommended that the NRF and the DST encourage universities and research institutions in South Africa to publish details of their research projects and the funders thereof in the interests of accountability and transparency.