MEDICINE AND THE LAW

Health research and safeguards: The South African journey

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Health research, as a social good, needs to be conducted in the interests of the common good. Because of the unfortunate exploitation of research participants globally, safeguards for protections are necessary. Most international codes and guidelines originated as responses to the abuse and mistreatment of research subjects. By the 1890s, antivivisectionists were already calling for laws to protect children, as a result of the increasing numbers of institutionalised children being subjected to vaccine experiments in Europe and the USA. Just after the turn of the century, the first attempt to test a polio vaccine was thwarted after the American Public Health Association condemned the programme. In South Africa, medical scientists were busy with discoveries and innovations as far back as the 1800s. In December 1967, the historic first human heart transplant was undertaken in Cape Town. Although it is unclear how much research preceded this procedure, there is no doubt that the operation was done in a research setting, and it had a far-reaching impact.

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The social and scientific worth of health research is indisputable. South Africa (SA)'s journey in this sphere is interesting, and dates back to the early 19th century. Health research needs to be conducted in the interests of the common good. Safeguards are instituted to facilitate ethical research because of the unfortunate global history of the exploitation of vulnerable individuals and groups enrolled in research. It must be emphasised that vulnerability is associated with the strong potential for exploitation. The fact that research participants require protection from exploitation highlights a highly disturbing issue in this context: that the researcher, sponsor and others may see an opportunity to capitalise on and take unfair advantage of the situation, to an individual's or group's detriment.[1] Most of the international codes and guidelines originated as responses to disaster, disgrace and dishonour as a result of the abuse and mistreatment of research subjects. However, in SA, the protectionist approach started off in the sixties in individual institutions, not because of scandals and tragedies in the country's research sites, but because morally, it was the right thing to do. This article, the first of a series of three, briefly considers health research in SA from a historical perspective, and discusses the need for and global response to protectionism and safeguards.[2]

History of health research in SA

In SA, medical scientists were busy with discoveries and innovations as far back as the 1800s. Ova of parasites that cause bilharzia were discovered in the urine of a patient from Uitenhage by Dr John Harley in 1864. About 30 years later, in 1895, the cycle of nagana, a disease of cattle spread by a species of tsetse fly, was uncovered by Sir David Bruce of the British Royal Army Medical Corps, in Zululand. Because of this, he was able to associate the disease with human sleeping sickness caused by a related parasite and transmitted by other tsetse flies. In 1912, the SA Institute for Medical Research (SAIMR) was established as a joint venture between the SA government and the Chamber of Mines, represented by the Witwatersrand Native Labour Association. While some research was conducted at the SAIMR, a major aspect of its activities was directed at routine screening and diagnostic work.[3] It has been argued that early medical research in SA was established to keep the mines in production, rather than to protect the population of mine workers from the high incidence of serious tropical diseases to which they were succumbing. It is suggested that the goal of medical research in SA at that time was based on narrow economic rather than humanitarian interests,[3] undoubtedly a utilitarian view.

The SAIMR played a substantial role in research involving pneumococci, which subsequently resulted in the development of the pneumococcal vaccine. In addition, the SAIMR researchers determined the transmission cycle of plague, and identified two species of *Anopheles* mosquito principally responsible for the transmission of malaria. As a result of rapid scientific and industrial development during the Second World War, research in many fields gained momentum in SA, especially at the University of Cape Town (UCT). In 1944, Dr Basil Schonland from the University of the Witwatersrand (Wits) was requested by General Jan Smuts, then Prime Minister and Minister of Defence of the country, to create the legislative basis for scientific research, and the Scientific Research Council Act No. 33 was promulgated in 1945. This Act established the principle of overall government control of research, and led to the establishment of the Council for Scientific and Industrial Research (CSIR) soon thereafter. The CSIR controlled the practical administration of research in the country. Although the CSIR's brief, while broad, did not include medicine, it established a co-ordinating committee (the Committee for Research in Medical Sciences) within the organisation, to take medical research forward. It was this committee that established several research units and sponsored research programmes in medical schools. It also participated in collaborative research with institutes outside SA. The established and fully fledged universities at that time were UCT, Wits, Stellenbosch University and the University of Pretoria.[3]

In December 1967, the historic first human heart transplant was carried out in Cape Town. Although it is unclear how much research preceded this procedure, there is no doubt that the operation was done in a research setting,[4] and it had a far-reaching impact. Spurred by this dramatic feat in therapy, Senator Walter Mondale of the USA

that year introduced a bill in congress, the Senate Joint Resolution (S.J.Res 145), which called for a National Commission on Health, Science and Society to 'evaluate the integrity and direction of research and to assess the impact of the technological advances on society, including issues of social justice generated by research.'[4] While only a few aspects of the bill were incorporated into legislation some years later, Mondale's attempts did succeed in changing the research terrain.[4]

Following the heart transplant, although most people around the world showered praise on SA, there were some objections, albeit somewhat muffled, that research could have been better channelled in other directions, towards the greater good for a greater number of South Africans, and that the research was only possible because of SA's oppressive apartheid policies.[3] However, Barnard's heart transplant was undoubtedly a major medical achievement. It also underscored the need for order in the organisation of medical research in the country. This requirement led to the enacting of the Medical Research Act No. 19 of 1969, and the establishment of the Medical Research Council (MRC) in 1969. Its most important mandate was to promote the improvement of health and the quality of life of the people of SA through research, development and technology transfer. The MRC was funded solely by an annual government grant. Initially, there was no provision for the acceptance of funds from other sources. The council was to co-ordinate medical research within the country, and to determine the distribution of government funding for such research.[3] It is interesting to note that, while legislation promulgating medical research was enacted, there was legislative and regulatory silence at that time on the protection of participants involved in these studies.

The historical origins of protectionism

Without doubt, even very early experiments with humans had positive outcomes. According to Sands, Murray and Cochran, in the 1700s James Lind, a British surgeon, studied scurvy in sailors over a 6-year period aboard the HMS *Salisbury*. He used an interventional study design in which some sailors were provided with a diet that included fresh fruits and vegetables, while others were given the 'standard of care' sailor diet that did not include the fresh products (the control group, as in contemporary research methodologies). In so doing, he was able to demonstrate that sailors in the control group were more likely to develop scurvy compared with those who received fresh fruits and vegetables.[5] Two-and-a-half decades later, Edward Jenner tested the cowpox vaccine on his children and other children in the area where he resided. These children did not get smallpox, and this was the origin of the smallpox vaccine.[5]

While these research successes were being celebrated, abuse and exploitation, resulting in violations of human dignity and disrespect for morality, were starting to surface in the field, and by the 1890s, antivivisectionists were already calling for laws to protect children because of the increasing numbers of institutionalised children being subjected to vaccine experiments in Europe and the USA. Therefore, just after the turn of the century, the first attempt to test a polio vaccine was thwarted after the American Public Health Association condemned the programme.[6] In 1897, Sanarelli, an Italian bacteriologist, injected five people with an organism that he had isolated to prove his postulation that it caused yellow fever. His action, which resulted in severe harm being suffered by the five, was widely criticised and remembered for some time thereafter.[5] By the end of the 19th century, research rules were imposed by the Prussian State,[7,8] and according to Lederer and Grodin, the US Congress contemplated the prohibition of medical experiments for particular groups, such as pregnant women, in the District of Columbia.[6] The Prussian Ministry of the Interior issued a regulation in 1891 that would not allow the treatment of tuberculosis with tuberculin against the patient's will, and although this was specific to the treatment and not to research, it was among the first initiatives towards clearly defining medical ethics regulations.[8] It also preceded research ethics regulation in Prussia, where in 1900, the Prussian Ministry of Religious, Educational and Medical Affairs issued a legal directive that 'absolutely prohibited' non-therapeutic interventions in humans if the subject did not consent to this unequivocally. In addition, proper explanation of the potential adverse consequences of the intervention was necessary before the subject could consent. This legal directive affirmed that voluntary informed consent as a requirement was fundamental to ethically sound experimentation.[8]

In the wake of the Sanarelli scandal, when Walter Reed was commissioned to identify the cause of yellow fever, a raging epidemic in Cuba at that time, he developed ethical guidelines to act as safeguards for the research, which was to be overseen by the US Army's Yellow Fever Board. This board could be described as the forerunner to what is today known as the research ethics committee. The guidelines included: self-experimentation by members on the board; written contracts that clearly explained the risks involved in the experimentation for locals who were not members of the board (the precursor to written informed consent forms); payment in gold for locals who volunteered; USD100 compensation for those who became ill with yellow fever; enrolment to be restricted to adults >24 years of age; children to be excluded; and all journal publications on the research to use the phrase 'with his full consent'.[5] The safeguards utilised by the Yellow Fever Board, the contract process for obtaining explicit consent and the heroism of the board members who participated as research subjects helped legitimise health research in the aftermath of emerging scandals.[5] It also led to medical researchers being 'largely inoculated against regulation by the legendary status of self-experimentation by the Yellow Fever Board members.'[6]

Conclusion

The importance of health research must be acknowledged, and moreover, celebrated, right from the outset. SA has a rich history of research in the health environment, dating back to the early 1800s. It is beyond doubt that studies in the healthcare context have improved wellbeing for people globally. This global progress has not been without cost to human dignity, however, resulting in both physical and social harms to enrolled subjects. The birth of protectionism that followed in the late 1800s is therefore not surprising. The next article will focus on the emergence of exploitation of the vulnerable in research, and will begin the discussions on protectionism in SA.

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